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SOLUBILITY DATA SERIES

Volume 2

KRYPTON, XENON AND RADON - Gas Solubilities

.

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SOLUBILITY DATA SERIES

Volume 2

KRYPTON, XENON AND RADON - Gas Solubilities

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In order to make this volume available as economically and as rapidly as possible the author's typescript has been reproduced in its original form. This method unfortunately has its typographical limitations but it is hoped that they in no way distract the reader.

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FOREWORD

If the knowledge is undigested or simply wrong, more is not better

How to communicate and disseminate numerical data effectively in chemical science and technology has been a problem of serious and growing concern to IUPAC, the International Union of Pure and Applied Chemistry, for the last two decades. The steadily expanding volume of numerical information, the formulation of new interdisciplinary areas in which chemistry is a partner, and the links between these and existing traditional subdisciplines in chemistry, along with an increasing number of users, have been considered as urgent aspects of the information problem in general, and of the numerical data problem in particular.

Among the several numerical data projects initiated and operated by various IUPAC commissions, the *Solubility Data Project* is probably one of the most ambitious ones. It is concerned with preparing a comprehensive critical compilation of data on solubilities in all physical systems, of gases, liquids and solids. Both the basic and applied branches of almost all scientific disciplines require a knowledge of solubilities as a function of solvent, temperature and pressure. Solubility data are basic to the fundamental understanding of processes relevant to agronomy, biology, chemistry, geology and oceanography, medicine and pharmacology, and metallurgy and materials science. Knowledge of solubility is very frequently of great importance to such diverse practical applications as drug dosage and drug solubility in biological fluids, anesthesiology, corrosion by dissolution of metals, properties of glasses, ceramics, concretes and coatings, phase relations in the formation of minerals and alloys, the deposits of minerals and radioactive fission products from ocean waters, the composition of ground waters, and the requirements of oxygen and other gases in life support systems.

The widespread relevance of solubility data to many branches and disciplines of science, medicine, technology and engineering, and the difficulty of recovering solubility data from the literature, lead to the proliferation of published data in an ever increasing number of scientific and technical primary sources. The sheer volume of data has overcome the capacity of the classical secondary and tertiary services to respond effectively.

While the proportion of secondary services of the review article type is generally increasing due to the rapid growth of all forms of primary literature, the review articles become more limited in scope, more specialized. The disturbing phenomenon is that in some disciplines, certainly in chemistry, authors are reluctant to treat even those limited-in-scope reviews exhaustively. There is a trend to preselect the literature, sometimes under the pretext of reducing it to manageable size. The crucial problem with such preselection - as far as numerical data are concerned - is that there is no indication as to whether the material was excluded by design or by a less than thorough literature search. We are equally concerned that most current secondary sources, critical in character as they may be, give scant attention to numerical data.

On the other hand, tertiary sources - handbooks, reference books, and other tabulated and graphical compilations - as they exist today, are comprehensive but, as a rule, uncritical. They usually attempt to cover whole disciplines, thus obviously are superficial in treatment. Since they command a wide market, we believe that their service to advancement of science is at least questionable. Additionally, the change which is taking place in the generation of new and diversified numerical data, and the rate at which this is done, is not reflected in an increased third-level service. The emergence of new tertiary literature sources does not parallel the shift that has occurred in the primary literature.

With the status of current secondary and tertiary services being as briefly stated above, the innovative approach of the *Solubility Data Project* is that its compilation and critical evaluation work involve consolidation and reprocessing services when both activities are based on intellectual and scholarly reworking of information from primary sources. It comprises compact compilation, rationalization and simplification, and the fitting of isolated numerical data into a critically evaluated general framework. The Solubility Data Project has developed a mechanism which involves a number of innovations in exploiting the literature fully, and which contains new elements of a more imaginative approach for transfer of reliable information from primary to secondary/tertiary sources. The fundamental trend of the Solubility Data Project is toward integration of secondary and tertiary services with the objective of producing in-depth critical analysis and evaluation which are characteristic to secondary services, in a scope as broad as conventional tertiary services.

Fundamental to the philosophy of the project is the recognition that the basic element of strength is the active participation of career scientists in it. Consolidating primary data, producing a truly critically-evaluated set of numerical data, and synthesizing data in a meaningful relation-ship are demands considered worthy of the efforts of top scientists. Career scientists, who themselves contribute to science by their involvement in active scientific research, are the backbone of the project. The scholarly work is commissioned to recognized authorities, involving a process of care-ful selection in the best tradition of IUPAC. This selection in turn is the key to the quality of the output. These top experts are expected to view their specific topics dispassionately, paying equal attention to their own contributions and to those of their peers. They digest literature data into a coherent story by weeding out what is wrong from what is believed to be right. To fulfill this task, the evaluator must cover all relevant open literature. No reference is excluded by design and every effort is made to detect every bit of relevant primary source. Poor quality or wrong data are mentioned and explicitly disqualified as such. In fact, it is only when the reliable data are presented alongside the unreliable data that proper justice can be done. The user is bound to have incomparably more confidence in a succinct evaluative commentary and a comprehensive review with a complete bibliography to both good and poor data.

It is the standard practice that any given solute-solvent system consists of two essential parts: I. Critical Evaluation and Recommended Values, and II. Compiled Data Sheets.

The Critical Evaluation part gives the following information: (i) a verbal text of evaluation which discusses the numerical solubility information appearing in the primary sources located in the literature. The evaluation text concerns primarily the quality of data after consideration of the purity of the materials and their characterization, the experimental method employed and the uncertainties in control of physical parameters, the reproducibility of the data, the agreement of the worker's results on accepted test systems with standard values, and finally, the fitting of data, with suitable statistical tests, to mathematical functions; (ii) a set of recommended numerical data. Whenever possible, the set

of recommended data includes weighted average and standard deviations, and a set of smoothing equations derived from the experimental data endorsed by the evaluator;

(11i) a graphical plot of recommended data.

The compilation part consists of data sheets of the best experimental data in the primary literature. Generally speaking, such independent data sheets are given only to the best and endorsed data covering the known range of experimental parameters. Data sheets based on primary sources where the data are of a lower precision are given only when no better data are available. Experimental data with a precision poorer than considered acceptable are reproduced in the form of data sheets when they are the only known data for a particular system. Such data are considered to be still suitable for some applications, and their presence in the compilation should alert researchers to areas that need more work.

The typical data sheet carries the following information: (i) components - definition of the system - their names, formulas and Chemical Abstracts registry numbers;

(11) reference to the primary source where the numerical information is reported. In cases when the primary source is a less common periodical or a report document, published though of limited availability, abstract references are also given;

(iii) experimental variables;

(iv) identification of the compiler;

(v) experimental values as they appear in the primary source. Whenever available, the data may be given both in tabular and graphical form. If auxiliary information is available, the experimental data are converted also to SI units by the compiler. Under the general heading of Auxiliary Information, the essential experimental details are summarized:

(vi) experimental method used for the generation of data;

(vii) type of apparatus and procedure employed;

(viii) source and purity of materials;

(ix) estimated error;

(x) references relevant to the generation of experimental data as cited in the primary source.

This new approach to numerical data presentation, developed during our four years of existence, has been strongly influenced by the diversity of background of those whom we are supposed to serve. We thus deemed it right to preface the evaluation/compilation sheets in each volume with a detailed discussion of the principles of the accurate determination of relevant solubility data and related thermodynamic information.

Finally, the role of education is more than corollary to the efforts we are seeking. The scientific standards advocated here are necessary to strengthen science and technology, and should be regarded as a major effort in the training and formation of the next generation of scientists and engineers. Specifically, we believe that there is going to be an impact of our project on scientific-communication practices. The quality of consoli-dation adopted by this program offers down-to-earth guidelines, concrete examples which are bound to make primary publication services more responsive than ever before to the needs of users. The self-regulatory message to scientists of 15 years ago to refrain from unnecessary publication has not achieved much. The literature is still, in 1978, cluttered with poor-quality articles. The Weinberg report (in "Reader in Science Information", Eds. J. Sherrod and A. Hodina, Microcard Editions Books, Indian Head, Inc., 1973, p. 292) states that "admonition to authors to restrain themselves from premature, unnecessary publication can have little effect unless the climate of the entire technical and scholarly community encourages restraint..." We think that projects of this kind translate the climate into operational terms by exerting pressure on authors to avoid submitting low-grade material. The type of our output, we hope, will encourage attention to quality as authors will increasingly realize that their work will not be suited for permanent retrievability unless it meets the standards adopted in this pro-ject. It should help to dispel confusion in the minds of many authors of what represents a permanently useful bit of information of an archival value, and what does not.

If we succeed in that aim, even partially, we have then done our share in protecting the scientific community from unwanted and irrelevant, wrong numerical information.

A. S. Kertes

December, 1978

PREFACE

The users of this volume will find (1) the available experimental solubility data of krypton, xenon, and radon gas in liquids as reported in the scientific literature, (2) tables of smoothed mole fraction solubility data for the systems which were studied over a temperature interval and (3) tables of either tentative or recommended solubility data when two or more laboratories reported solubility data over the same range of temperature and pressure for a system. Users have the option of using the experimental values, either directly, or in their own smoothing equations, or of using the smoothed values prepared by the compilers and evaluators. The goal was to cover the literature thoroughly enough so that the user need not do a detailed literature search for krypton, xenon, and radon solubility data prior to 1978.

Some words of explanation are required with respect to units, corrections, smoothing equations, auxiliary data and data sources, nomenclature, and other points. The experimental data are presented in the units found in the original paper. In addition the original data are often converted to other units, especially mole fraction. Temperatures have been converted to Kelvin. In evaluations of solubility data, S.I. units are used.

Only in the past 10 to 15 years have experimental methods for the determination of the solubility of gases in liquids developed to the point where 0.5 percent or better accuracy is attained. Only a small fraction of the literature's gas solubility data are accurate to 0.5 percent. The corrections for non-ideal gas behavior and for expansion of the liquid phase on dissolution of the gas are small and well within the normal experimental error. Thus such corrections were not made for the krypton and xenon gas solubility data at low pressure. For radon gas solubility data the real gas volume of $22,290 \text{ cm}^3 \text{ mol}^{-1}$ at standard conditions was used in the calculation of mole fraction.

Small, often unknown partial pressures, of radioactive krypton, xenon and radon are frequently used in the measurement of Ostwald coefficients. Bunsen coefficients and mole fraction gas solubilities at 101.325 kPa (1 atm) were calculated from the Ostwald coefficient, assuming that the Ostwald coefficient was independent of pressure. This is a reasonable often made assumption. However, it is an assumption, and the Bunsen coefficients and mole fraction solubilities calculated from Ostwald coefficients measured at low unknown partial pressures of radioactive gas should be accepted with caution.

The lack of high accuracy is also the reason that only a two-constant equation is used to smooth and evaluate most of the gas solubility data. A Gibbs energy of solution equation linear in temperature is used

 $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = A + BT$

or in alternate form

 $\ln X_1 = -\Delta G^{\circ}/RT = -(A/R)/T - (B/R)$

where A is ΔH° , B is $-\Delta S^{\circ}$, X₁ is the mole fraction solubility at a gas partial pressure of 101.325 kPa (1 atm), and R is 8.31433 J K⁻¹ mol⁻¹. The constants A and B require five digits to reproduce the mole fraction solubility to three significant figures. Although the constants are given to five digits it is not intended to imply that the values of the changes in enthalpy and entropy of solution are significant to more than two or three digits.

An inconsistency, which we believe is justified, is found with respect to the solubility data in water. Much time and effort was expended in evaluating the solubility data of each gas in water. A recommended equation and table of values are presented. However, for systems which contain water and other solvent compounds such as electrolytes or water miscible polar organic compounds, the experimental gas solubility in water from that paper is given, even when it is at variance with our recommended values. These data of sometimes poorer quality are presented because the author's ratio of gas solubility in water to solubility in the aqueous solution may be more accurate than the solubility itself. This may be especially true of some of the solubility data in aqueous electrolyte solutions. Solvent density data were often required in making solubility unit conversions. The density data were not directly referenced. The main sources of density data are Circular 461 of the U.S. National Bureau of Standards

American Petroleum Research Project 44 Publications
The International Critical Tables, Volume III (E.W. Washburn, Editor) McGraw-Hill Co., 1931
Smow Table, <u>Pure and Applied Chemistry</u> 1976, 45, 1-9
Thermodynamic Properties of Aliphatic Alcohols, R. C. Wilhoit and B. J. Zwolinski, J. <u>Phys. Chem. Ref. Data</u> 1973, 2, Supplement No. 1
Organic Solvents, J. A. Riddick and W. B. Bunger (Technique of Chemistry, Volume II, A. Weissberger, Editor) Wiley-Interscience, New York, 1970, 3rd Ed.

The solubility data are supplemented with partial molal volume and calorimetric enthalpy of solution data when they are available.

Chemical Abstracts recommended names and registry numbers were used throughout. Common names are cross referenced to Chemical Abstract recommended names in the index.

The Editor would appreciate users calling errors and omissions to his attention.

The Editor gratefully acknowledges the advice and comments of members of the IUPAC Commission on Equilibrium Data and the Subcommittee on Solubility Data; the cooperation and hard work of the Evaluators and compilers; and the untiring efforts of the typists Peggy Tyler, Carolyn Dowie, and Lesley Flanagan.

Acknowledgment is made to the Donors of the Petroleum Research Fund, administered by the American Chemical Society, for partial support of the compilation and evaluation of the gas solubility data.

H. Lawrence Clever

Atlanta, GA December, 1978 THE SOLUBILITY OF GASES IN LIQUIDS

C. L. Young, R. Battino, and H. L. Clever

INTRODUCTION

The Solubility Data Project aims to make a comprehensive search of the literature for data on the solubility of gases, liquids and soluds in liquids. Data of suitable accuracy are compiled into data sheets set out in a uniform format. The data for each system are evaluated and where data of sufficient accuracy are available values recommended and in some cases a smoothing equation suggested to represent the variation of solubility with pressure and/or temperature. A text giving an evaluation and recommended values and the compiled data sheets are published on consecutive pages.

DEFINITION OF GAS SOLUBILITY

The distinction between vapor-liquid equilibria and the solubility of gases in liquids is arbitrary. It is generally accepted that the equilibrium set up at 300K between a typical gas such as argon and a liquid such as water is gas-liquid solubility whereas the equilibrium set up between hexane and cyclohexane at 350K is an example of vapor-liquid equilibrium. However, the distinction between gas-liquid solubility and vapor-liquid equilibrium is often not so clear. The equilibria set up between methane and propane above the critical temperature of methane and below the critical temperature of propane may be classed as vapor-liquid equilibrium or as gas-liquid solubility depending on the particular range of pressure considered and the particular worker concerned.

The difficulty partly stems from our inability to rigorously distinguish between a gas, a vapor, and a liquid, which has been discussed in numerous textbooks. We have taken a fairly liberal view in these volumes and have included systems which may be regarded, by some workers, as vapor-liquid equilibria.

UNITS AND QUANTITIES

The solubility of gases in liquids is of interest to a wide range of scientific and technological disciplines and not solely to chemistry. Therefore a variety of ways for reporting gas solubility have been used in the primary literature and inevitably sometimes, because of insufficient available information, it has been necessary to use several quantities in the compiled tables. Where possible, the gas solubility has been quoted as a mole fraction of the gaseous component in the liquid phase. The units of pressure used are bar, pascal, millimeters of mercury and atmosphere. Temperatures are reported in Kelvin.

EVALUATION AND COMPILATION

The solubility of comparatively few systems is known with sufficient accuracy to enable a set of recommended values to be presented. This is true both of the measurement near atmospheric pressure and at high pressures. Although a considerable number of systems have been studied by at least two workers, the range of pressures and/or temperatures is often sufficiently different to make meaningful comparison impossible.

Occasionally, it is not clear why two groups of workers obtained very different sets of results at the same temperature and pressure, although both sets of results were obtained by reliable methods and are internally consistent. In such cases, sometimes an incorrect assessment has been given. There are several examples where two or more sets of data have been classified as tentative although the sets are mutually inconsistent.

Many high pressure solubility data have been published in a smoothed form. Such data are particularly difficult to evaluate, and unless specifically discussed by the authors, the estimated error on such values can only be regarded as an "informed guess". Many of the high pressure solubility data have been obtained in a more general study of high pressure vapor-liquid equilibrium. In such cases a note is included to indicate that additional vapor-liquid equilibrium data are given in the source. Since the evaluation is for the compiled data, it is possible that the solubility data are given a classification which is better than that which would be given for the complete vapor-liquid data (or vice versa). For example, it is difficult to determine coexisting liquid and vapor compositions near the critical point of a mixture using some widely used experimental techniques which yield accurate high pressure solubility data. For example, conventional methods of analysis may give results with an expected error which would be regarded as sufficiently small for vapor-liquid equilibrium data but an order of magnitude too large for acceptable high pressure gas-liquid solubility.

It is occasionally possible to evaluate data on mixtures of a given substance with a member of a homologous series by considering all the available data for the given substance with other members of the homologous series. In this study the use of such a technique has been very limited.

The estimated error is often omitted in the original article and sometimes the errors quoted do not cover all the variables. In order to increase the usefulness of the compiled tables estimated errors have been included even when absent from the original article. If the error on *any* variable has been inserted by the compiler this has been noted.

PURITY OF MATERIALS

The purity of materials has been quoted in the compiled tables where given in the original publication. The solubility is usually more sensitive to impurities in the gaseous component than to liquid impurities in the liquid component. However, the most important impurities are traces of a gas dissolved in the liquid. Inadequate degassing of the absorbing liquid is probably the most often overlooked serious source of error in gas solubility measurements.

APPARATUS AND PROCEDURES

In the compiled tables brief mention is made of the apparatus and procedure. There are several reviews on experimental methods of determining gas solubilities and these are given in References 1-7.

METHODS OF EXPRESSING GAS SOLUBILITIES

Because gas solubilities are important for many different scientific and engineering problems, they have been expressed in a great many ways:

The Mole Fraction, X(g)

The mole fraction solubility for a binary system is given by:

$$X(g) = \frac{n(g)}{n(g) + n(1)}$$

 $= \frac{W(g)/M(g)}{\{W(g)/M(g)\} + \{W(1)/M(1)\}}$

here n is the number of moles of a substance (an *amount* of substance), W is the mass of a substance, and M is the molecular mass. To be unambiguous, the partial pressure of the gas (or the total pressure) and the temperature of measurement must be specified.

The Weight Per Cent Solubility, wt%

For a binary system this is given by

wt% = 100 $W(g) / \{W(g) + W(1)\}$

where W is the weight of substance. As in the case of mole fraction, the pressure (partial or total) and the temperature must be specified. The weight per cent solubility is related to the mole fraction solubility by

$$(g) = \frac{\{wt\&/M(g)\}}{\{wt\&/M(g)\} + \{(100 - wt\&)/M(1)\}}$$

The Weight Solubility, C_W

х

The weight solubility is the number of moles of dissolved gas per gram of solvent when the partial pressure of gas is 1 atmosphere. The weight solubility is related to the mole fraction solubility at one atmosphere partial pressure by

X(g) (partial pressure 1 atm) = $\frac{C_{w}^{M}(1)}{1 + C_{w}^{M}(1)}$

where M(1) is the molecular weight of the solvent.

The Moles Per Unit Volume Solubility, n

Often for multicomponent systems the density of the liquid mixture is not known and the solubility is quoted as moles of gas per unit volume of liquid mixture. This is related to the mole fraction solubility by

$$X = \frac{n v^{0}(1)}{1 + n v^{0}(1)}$$

where $v^{O}(1)$ is the molar volume of the liquid component.

The Bunsen Coefficient, α

The Bunsen coefficient is defined as the volume of gas reduced to 273.15K and 1 atmosphere pressure which is absorbed by unit volume of solvent (at the temperature of measurement) under a partial pressure of 1 atmosphere. If ideal gas behavior and Henry's law is assumed to be obeyed,

$$\alpha = \frac{V(g)}{V(1)} \frac{273.15}{T}$$

where V(g) is the volume of gas absorbed and V(1) is the original (starting) volume of absorbing solvent. The mole fraction solubility X is related to the Bunsen coefficient by

$$X (l atm) = \frac{\alpha}{\alpha + \frac{273.15}{T} \frac{v^{o}(g)}{v^{o}(l)}}$$

where $v^{O}(g)$ and $v^{O}(1)$ are the molar volumes of gas and solvent at a pressure of one atmosphere. If the gas is ideal,

$$X = \frac{\alpha}{\alpha + \frac{273.15R}{v^{\circ}(1)}}$$

Real gases do not follow the ideal gas law and it is important to establish the real gas law used for calculating α in the original publication and to make the necessary adjustments when calculating the mole fraction solubility.

The Kuenen Coefficient, S

This is the volume of gas, reduced to 273.15K and 1 atmosphere pressure, dissolved at a partial pressure of gas of 1 atmosphere by 1 gram of solvent. The Ostwald Coefficient, L

The Ostwald coefficient, L, is defined as the ratio of the volume of gas absorbed to the volume of the absorbing liquid, all measured at the same temperature:

$$L = \frac{V(q)}{V(1)}$$

If the gas is ideal and Henry's Law is applicable, the Ostwald coefficient is independent of the partial pressure of the gas. It is necessary, in practice, to state the temperature and total pressure for which the Ostwald coefficient is measured. The mole fraction solubility, X, is related to the Ostwald coefficient by

$$X = \left[\frac{RT}{P(g) L v^{O}(1)} + 1 \right]^{-1}$$

where P is the partial pressure of gas. The mole fraction solubility will be at a partial pressure of P(g).

The Absorption Coefficient, B

There are several "absorption coefficients", the most commonly used one being defined as the volume of gas, reduced to 273.15K and 1 atmosphere, absorbed per unit volume of liquid when the total pressure is 1 atmosphere. β is related to the Bunsen coefficient by

 $\beta = \alpha (1-P(1))$

where P(1) is the partial pressure of the liquid in atmosphere.

The Henry's Law Constant

A generally used formulation of Henry's Law may be expressed as

 $P(g) = K_H X$

where ${\rm K}_{\rm H}$ is the Henry's Law constant and X the mole fraction solubility. Other formulations are

 $P(g) = K_2C(1)$

or

 $C(g) = K_{c}C(1)$

where K_2 and K_c are constants, C the concentration, and (1) and (g) refer to the liquid and gas phases. Unfortunately, K_H , K_2 and K_c are all sometimes referred to as Henry's Law constants. Henry's Law is a limiting law but can sometimes be used for converting solubility data from the experimental pressure to a partial gas pressure of 1 atmosphere, provided the mole fraction of the gas in the liquid is small, and that the difference in pressures is small. Great caution must be exercised in using Henry's Law.

The Mole Ratio, N

The mole ratio, N, is defined by

N = n(g)/n(1)

Table 1 contains a presentation of the most commonly used inter-conversions not already discussed.

For gas solubilities greater than about 0.01 mole fraction at a partial pressure of 1 atmosphere there are several additional factors which must be taken into account to unambiguously report gas solubilities. Solution densities or the partial molar volume of gases must be known. Corrections should be made for the possible non-ideality of the gas or the non-applicability of Henry's Law. TABLE 1 Interconversion of parameters used for reporting solubility

$$L = \alpha (T/273.15)$$

$$C_{W} = \alpha / v_{o} \rho$$

$$K_{H} = \frac{17.033 \times 10^{6} \rho_{soln}}{\alpha M(1)} + 760$$

$$L = C_{W} v_{t,gas} \rho$$

where v is the molal volume of the gas in cm³mol⁻¹ at 0°C, ρ the der sity of the solvent at the temperature of the measurement, ρ_{soln} the density of the solution at the temperature of the measurement, and v_t gas the molal volume of the gas (cm³mol⁻¹) at the temperature of the measurement. is the molal volume of the gas in cm^3mol^{-1} at 0°C, ρ the den-

SALT EFFECTS

The effect of a dissolved salt in the solvent on the solubility of a gas is often studied. The activity coefficient of a dissolved gas is a function of the concentration of all solute species (see ref. 8). At a given tem-perature and pressure the logarithm of the dissolved gas activity coefficient can be represented by a power series in C_s, the electrolyte concentration, and C_i, the nonelectrolyte solute gas concentration

$$\log f_{i} = \sum_{m,n} k_{mn} C_{s}^{n} C_{i}^{m}$$

It is usually assumed that only the linear terms are important for low ${\tt C_S}$ and ${\tt C_i}$ values when there is negligible chemical interaction between solute species.

$$\log f_i = k_s C_s + k_1 C_i$$

where k_s is the salt effect parameter and k_i is the solute-solute gas interaction parameter. The dissolved gas activity is the same in the pure solvent and a salt solution in that solvent for a given partial pressure and temperature o

$$a_1 = f_1 S_1 = f_1^{\circ} S_1^{\circ}$$
 and $f_1 = f_1^{\circ} = \frac{S_1^{\circ}}{S_1}$

where S_i and S_i^{0} are the gas solubility in the salt solution and in the pure solvent, respectively, and the f's are the corresponding activity coefficients. It follows that $\log f_1 = \log S_1^{0} = k_s C_s + k_i (S_i - S_i^{0})$. When the f,⁰ s_i

quantity (S_i - S_i^O) is small the second term is negligible even though k_s and k_i may be of similar magnitude. This is generally the case for gas solubilities and the equation reduces to

$$\log \frac{f_i}{f_i^o} = \log \frac{s_i^o}{s_i} = k_s C_s$$

which is the form of the empirical Setschenow equation in use since the 1880's. A salt that increases the activity coefficient of the dissolved gas is said to salt-out and a salt that decreases the activity coefficient of the dissolved gas is said to salt-in.

Although salt effect studies have been carried out for many years, there appears to be no common agreement of the units for either the gas solubility or the salt concentration. Both molar (mol dm⁻¹) and molal (mol kg⁻¹) are used for the salt concentration. The gas solubility ratio Si^O/Si is given as Bunsen coefficient ratio and Ostwald coefficient ratio,

К X R — В

which would be the same as a molar ratio; Kueunen coefficient ratio, volume dissolved in 1 g or 1 kg of solvent which would be a molal ratio; and mole fraction ratio. Recent theoretical treatments use salt concentration in mol dm^{-3} and S_i°/S_i ratio as mole fraction ratio with each salt ion acting as a mole. Evaluations which compare the results of several workers are made in the units most compatible with present theory.

TEMPERATURE DEPENDENCE OF GAS SOLUBILITY

In a few cases it has been found possible to fit the mole fraction solubility at various temperatures using an equation of the form

 $\ln x = A + B / (T/100K) + C \ln (T/100K) + DT/100K$

It is then possible to write the thermodynamic functions $\overline{\Delta G_1^0}$, $\overline{\Delta H_1^0}$, $\overline{\Delta S_1^0}$ and $\Delta \overline{C}^{\circ} p_{1}$ for the transfer of the gas from the vapor phase at

101,325 Pa partial pressure to the (hypothetical) solution phase of unit mole fraction as:

> $\Delta \overline{G}_{1}^{\circ} = -RAT - 100 RB - RCT ln (T/100) - RDT^{2}/100$ $\Delta \overline{S}_{1}^{2} = RA + RC \ln (T/100) + RC + 2 RDT/100$ $\Delta \overline{H}_{2}^{\circ} = -100 \text{ RB} + \text{RCT} + \text{RDT}^{2}/100$ ∆Ĉ°p, = RC + 2 RDT/100

In cases where there are solubilities at only a few temperatures it is convenient to use the simpler equations

 $\Delta \overline{G}_1^\circ = - RT \ln x = A + BT$

in which case $A = \Delta \overline{H}_1^\circ$ and $-B = \Delta \overline{S}_1^\circ$.

REFERENCES

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 Wilhelm, E.; Battino, R.; Wilcock, R. J. <u>Chem. Rev. 1977</u>, 77, 219.
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Non-SI Unit	1	. (nc		t t	Jnit) = Unit)		1	(SI k-1	k ^{-]} Unit	E)	= Uni	+)
LENGTH								<u></u>			it, I	
Å (angstrom) cm (centimeter) in (inch) ft (foot)		3	1 254	x x	10 ⁻¹⁰ 10 ⁻² 10 ⁻⁴ 10 ⁻⁴	(*)	3 3	937 280	1 1 008 840	x x x x x	10^{10} 10^{2} 10^{-5} 10^{-6}	(* (*
AREA									SI	Un	it, 1	m2
cm ² in ² ft ²	9	64 290	1 516 304	x x x	10-4 10-8 10-8	(*) (*) (*)	1	550 076	1 003 391	x x x	10 ⁴ 10-3 10-5	(*
VOLUME				•••••					SI	Un	nit,	m 3
cm ³ in ³ ft ³ l (litre) UKgal (UK gallon) USgal (US gallon)	16 2	45	1 461	x x	$10^{-6}_{10}_{10}_{12}$ $10^{-8}_{10}_{-3}_{10}_{-7}_{10}_{10}_{-7}$	(*) (*) (*)	6 3	531	374 467 1 997	X X X X	10 ⁶ 10 ⁻² 10 ⁻⁵ 10 ³ 10 ⁻² 10 ⁻²	(*
MASS									SI	Ur	nit,	kg
g (gram) t (tonne) lb (pound)	45	359	1	x	10^{-3} 10^{3} 10^{-8}	(*) (*) (*)	2	204	1	x	10^{3} 10^{-3} 10^{-6}	(*
DENSITY									SIU	nit	z, kg	m
g cm ⁻³ g l ⁻¹ lb in ⁻³ lb ft ⁻³ lb UKgal ⁻¹ lb USgal ⁻¹	1	601 99	1 991 847 776	x x x	10^{3} 10^{-2} 10^{-5} 10^{-3} 10^{-4}	(*) (*)	6	242 100	1 728 795 224	x x x	10^{-3} 10^{-1} 10^{-8} 10^{-7} 10^{-9}	ı ^{(*}
PRESSURE					SI	Unit,	Pa	(pas	cal,	kç	g m ⁻¹	s ⁻²
dyn cm ⁻² at (kgf cm ⁻²) atm (atmosphere) bar lbf in ⁻² (p.s.i.) lbf ft ⁻² inHg (inch of mercury) mmHg (millimeter of mercury, torr)	3	101 894 47 386	665 325 1 757 880 388	x x x x x	10^{-1} 10^{-1} 10^{5} 10^{-3} 10^{-3} 10^{-4}	(*) (*) (*) (*)	9 1 2	869 450 20 952	233 1 377 886 999	X X X X X	10 10-1 10-5 10-1 10-6 10-1 10-9	.0 (* .0

APPENDIX I. Conversion Factors k and k^{-1} k^{-1} k 1 (non-SI Unit) = 1 (SI Unit) = Non-SI Unit <u>k-1 (non-SI Unit)</u> k (SI Unit) Unit, J (joule, kg m^2s^{-2}) ENERGY $\begin{array}{c} 1 \times 10^{7} (*) \\ 2 388 459 \times 10^{-7} \\ 2 390 057 \times 10^{-7} \\ 2 777 778 \times 10^{-13} \\ 9 869 233 \times 10^{-9} \\ 7 375 622 \times 10^{-7} \\ 3 725 062 \times 10^{-13} \\ 9 478 172 \times 10^{-10} \end{array}$ $\begin{array}{r}
1 \times 10^{-7} \\
41 868 \times 10^{-4} \\
4 184 \times 10^{-3} \\
36 \times 10^{5} \\
101 325 \cdots 10^{-3}
\end{array}$ (*) erg cal_{IT} (I.T. calorie) cal_{th} (thermochemical calorie) kW h (kilowatt hour) (*) (*) (*) 101 325 x 10⁻³ 1 355 818 x 10⁻⁶ (*) l atm ft 1bf hp h (horse power hour) 2 684 519 $1 055 056 \times 10^{-3}$ Btu (British thermal unit)

An asterisk (*) denotes an exact relationship

COMPONENTS:	EVALUATOR:	
1. Krypton; Kr; 7439-90-9 2. Water; H ₂ O; 7732-18-5	Rubin Battino, Department of Chemistry, Wright State University Dayton, Ohio, 45431 U.S.A. June 1978	

CRITICAL EVALUATION:

The experimental solubility data produced by three workers was considered to be of sufficient reliability to use for the smoothing equation. In fitting the data to the equation those points which were different by about two standard deviations or more from the smoothed values were rejected. Most of the low temperature values of Morrison and Johnstone were thrown out, but since they had the only higher temperature data these were retained. The transition between their high temperature data and the more reliable low temperature data of the other two workers was smooth. We used 30 points for the final smoothing and they were obtained as follows (reference - number of data points used from that reference): 1-8; 2-6; 3-16. The fitting equation used was

$$\ln x_1 = A + B/(T/100K) + C \ln (T/100K) + DT/100F$$

where x_1 is the mole fraction solubility of krypton at 101,325 Pa (1 atm) partial pressure of gas. The fit in $\ln x_1$ gave a standard deviation of 0.32% taken at the middle of the temperature range. Table 1 gives the smoothed values of the mole fraction solubility (at 101,325 Pa partial pressure of gas) and the Ostwald coefficient at 5K intervals.

Table 1 also gives the thermodynamic functions $\Delta \overline{G}_{1}^{\circ}$, $\Delta \overline{H}_{1}^{\circ}$, $\Delta \overline{S}_{2}^{\circ}$, $\Delta \overline{C}_{p_{1}}^{\circ}$ for the transfer of gas from the vapor phase at 101,325 Pa partial gas pressure to the (hypothetical) solution phase of unit mole fraction. These thermodynamic properties were calculated from the smoothing equation according to the following equations:

 $\Delta \overline{G}_{1}^{\circ} = -RAT - 100RB - RCT \ln (T/100) - RDT^{2}/100$ (2)

 $\Delta \bar{S}_{1}^{\circ} = RA + RC \ln (T/100) + RC + 2RDT/100$ (3)

 $\Delta \overline{H}_{1}^{\circ} = -100 RB + RCT + RDT^{2}/100$ (4)

 $\Delta \overline{C}_{p_1}^{\circ} = RC + 2RDT/100$

(5)

The best fit for the 30 data points gave the following equation

 $\ln x_1 = -66.9928 + 91.0166/(T/100K) + 24.2207 \ln (T/100K)$ (6)

The data from six other workers were rejected for the following reasons. Yeh and Peterson's values (4) were 3 to 4 per cent low. Antropoff's data (5) were very far off, being all much too low. König's results (6) were also low, being off by about 4 to 12 per cent. The two values by Van Liempt (7) were rather imprecise. Kitani (8) determined the solubility of krypton-85 in water, saline, lipids and blood at 37° C by a radiochemical technique. Seventeen determinations at the one temperature were reproducible to \pm 4% and were 5% lower than the selected values in this section. Wood and Caputi (9) determined the solubilities from 1 to 48°C in water and sea water, but their results are 2 to 5% high.

(1)

COMPONENTS :	EVALUATOR:	
 Krypton; Kr; 7439-90-9 Water; H₂O; 7732-18-5 	Rubin Battino Department of Chemistry Wright State University Dayton, Ohio 45431 U.S.A.	
	June 1978	

CRITICAL EVALUATION:

Table 1. Smoothed values of the solubility of krypton in water and thermodynamic functions^aat 5K intervals using equation 6 at 101,325 Pa partial pressure of krypton.

Т/К	Mol Fraction X ₁ x 10 ⁵	Ostwald Coefficient L x 10 ²	∆G ^b /KJ mol ⁻¹	∆H ₁ [°] /KJ mol ⁻¹	∆\$ [°] 1/JK ⁻¹ mol ⁻¹
273.15	8.842	11.000	21.20	-20.67	-153
278.15	7.537	9.550	21.95	-19.66	-150
283.15	6.511	8.396	22.69	-18.65	-146
288.15	5.696	7.470	23.41	-17.65	-142
293.15	5.041	6.720	24.12	-16.64	-139
298.15	4.512	6.109	24.80	-15.63	-136
303.15	4.079	5.609	25.47	-14.63	-132
308.15	3.725	5.197	26.13	-13.62	-129
313.15	3.432	4.858	26.76	-12.61	-126
318.15	3.190	4.578	27.39	-11.61	-123
323.15	2.990	4.348	27.99	-10.60	-119
328.15	2.823	4.160	28.58	-9.59	-116
333.15	2.686	4.007	29.15	-8.58	-113
338.15	2.572	3.885	29.71	-7.58	-110
343.15	2.480	3.790	30.26	-6.57	-107
348.15	2.405	3.718	30.79	-5.56	-104
353.15	2.346	3.668	31.30	-4.56	-102

 ${}^{a}\Delta \overline{C}^{\bullet}_{p_{1}}$ was independent of temperature and has the value 201 JK⁻¹mol⁻¹.

^bcal_{th} = 4.184 joule.

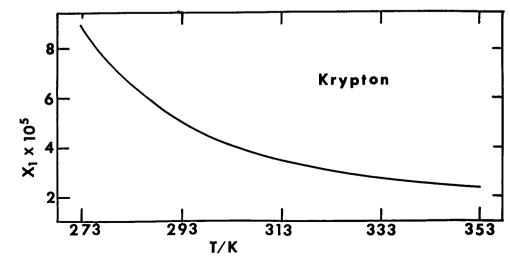


FIGURE 1. The mole fraction solubility of krypton in water at a krypton partial pressure of 101.325 kPa (1 atm).

COMPONENTS: EVALUATOR: Rubin Battino 1. Krypton; Kr; 7439-90-9 Department of Chemistry Wright State University 2. Water; H₂O; 7732-18-5 Dayton, Ohio 45431 U.S.A. June 1978 CRITICAL EVALUATION: Anderson, Keeler, and Klach (10) measured the solubility of krypton + krypton-85 between 373 and 573K at partial pressures of 1.5 to 60×10^{-4} psia in the presence of oxygen gas at pressures between 270 and 1930 psia. The mole fraction solubility calculated at 101.325 kPa krypton partial pressure appears to be a consistent extension of the krypton solubilities below 353K. The combined data indicates the minimum solubility is at 380 K. See the data sheets for the Anderson, Keeler and Klach paper for additional information. Alexander (11) made seven determinations of the heat of solution of krypton in water at 298.15 K. He obtained an enthalpy of solution of -(15.8₂ \pm 0.6₈) kJ mol⁻¹. The value agrees well with the value of -15.63 kJ mol-1 derived from the solubility data. Popov and Drakin (12, 13) measured the apparent molar volume of krypton dissolved in water under a krypton partial pressure of 4.7 to 20.1 atm at 298.15 K by a density method. p/atm 4.70 12.00 15.20 18.27 20.10 $\overline{v}/cm^3 mol^{-1}$ 38 + 5 32 ± 2 31.2 ± 1.4 31.4 ± 1.2 31.3 ± 1.1 They recommended a value of $31.3 \text{ cm}^3 \text{ mol}^{-1}$. References Morrison, T. J.; Johnstone, N. B. J. Chem. Soc. 1954, 3441. 1. Benson, B. B.; Krause, D. J. Chem. Phys. 1976, 64, 689. 2. Weiss, R. F.; Kyser, T. K. J. Chem. Eng. Data 1978, 23, 69. 3. 4. Yeh, S-Y.; Peterson, R. E. J. Pharm. Sci. 1964, 53, 822. Antropoff, A. Proc. Roy. Soc. (London) 1910, 83, 474; 5. Z. Elektrochem. 1919, 25, 269. König, H. Z. Naturforsch. 1963, 18a, 363. 6. van Liempt, J. A. M.; van Wijk, W. <u>Rec</u>. <u>Trav. Chim</u>. 1937, <u>56</u>, 632. 7. 8. Kitani, K. Scand. J. Clinical Lab. Invest. 1972, 29, 167. Wood, D.; Caputi, R. AD631557, Avail. CFSTI, 1966, 17 pp. 9. Anderson, C. J.; Keeler, R. A.; Klach, S. J. 10. J. Chem. Eng. Data 1962, 7, 290. Alexander, D. M. J. Phys. Chem. 1959, 63, 994. 11. Popov, G. A.; Drakin, S. I. Moskov. Khimiko-technol. Inst. Trudy 12. 1972, 71, 43. 13. Popov, G. A.; Drakin, S. I. Zh. Fiz. Khim. 1974, 48, 631.

The last three paragraphs of the evaluation were added by the Editor.

COMPONENTS: 1. Kryp	oton; Kr; 7439	-90-9	ORIGINAL MEASUREMENTS: Morrison, T. J.; Johnstone, N. B.					
			J. <u>Chem</u> . <u>Soc</u> . 1954, 3441 - 3446.					
2. Wate	er; H ₂ O; 7732-	18-5						
/ARIABLES:			PREPARED I	·····				
			I KEFAKED I					
2	г/к: 279.75 -	348.05		R. Battino				
EXPERIMENTA	L VALUES:							
T/K	Mol Fraction	Kunenen	T/K	Mol Fraction	Kunenen			
	x ₁ × 10 ⁵	$\frac{\text{Coefficient}}{\text{S}_0 \times 10^3}$		x ₁ x 10 ⁵	$\frac{\text{Coefficient}}{S_0 \times 10^3}$			
279.75	6.591	82.0	319.15	3.110	38.3			
281.15	6.382	79.4	325.05	2.923*	35.9			
285.75	5.589	69.5	331.05	2.719*	33.3			
288.65	5.277	65.6	332.95	2.681*	32.8 31.6			
291.35	4.966	61.7	337.85 340.65	2.590* 2.520*	31.6			
294.35	4.687	58.2 53.5	340.65	2.520*	29.7			
297.85 303.35	4.312 3.948	48.9	344.05	2.431*	29.5			
303.35	3.582	44.3	348.05	2.416*	29.3			
314.55	3.290	40.6						
		AUXILIARY	INFORMATIO					
ŒTHOD:				PURITY OF MATER				
liquid	in a thin film		res	pton. 99-1009 idue being xer				
gas in changes See ref	are measured	spiral. Volume in burets.	2. Wat	er. no commer hors.	its made by			
DDADAMIC (-	22000000		ESTIMATED	ERROR:				
APPARATUS/H	RUCEDURE:			ta at lower te				
Billett	ratus of Morri (1) used.		are sev	veral per cent	low.			
The equatio	authors smooth n is	ning	REFERENCE	S:	······································			
log ₁₀ 8 ₀	= -60.434 +	(3410)/(T/K)	1. Mor <u>J</u> .	rison, T. J.; Chem. Soc. 19	Billett, F. 52, 3819.			

COMPONENTS:	<u></u>	ORIGIN	AL MEASUREMENTS :
1. Krypton; Kr; 743	9-90-9		
			on, B. B.; Krause, D. hem. Phys. 1976, <u>6</u> 4, 689 - 709.
2. Water; H ₂ O; 7732 [.]	-18-5		
VARIABLES:		PREPAR	ED BY:
т/к: 273.151	- 318.154		R. Battino
EXPERIMENTAL VALUES:		<u>l</u>	
	T/K Mo	ol Fraction	Bunsen Coefficient
		X ₁ × 10 ⁵	$\alpha \times 10^3$
	275.151	8.3389	103.224
	278.141	7.5712	93.727
	288.147	5.7156*	70.704
	293.155	5.0492*	64.424
	298.147	4.5339*	55.978
	303.150	4.0881*	50.408
	308.155	3.7407*	46.052
	318.154	3.2119*	39.396
·····	AUXI	LIARY INFORM	NTION
METHOD /APPARATUS/PROCE	DURE:	SOURCE	AND PURITY OF MATERIALS:
Gas-free water an		1 _	Krypton. No comment by authors.
are equilibrated, an samples of the liqui phases are isolated. solved in the water the number of moles special mercury anom removal of the water number of moles in t gaseous phase is mea same manometer; from sure (and fugacity)	d and gaseo The gas d is extracte determined eter. Afte vapor, the he sample o sured with which the above the s	us 2. is- d and on a r f the the pres- olu-	Water. No comment by authors.
tion may be calculat corrections are made maximum error is 0.0 drawings of the appa given in the origina	ed. Real g . Predicte 2%. No ratus are	as d Smoo the	TED ERROR: thed data fit to 0.11% rms in solubility. Calculated error easurements is 0.02%.
		j i	

OMPONENTS :					
1 77		· · · · · · · · · · · · · · · · · · ·	ORIGINAL ME	ASUREMENTS:	<u>, </u>
1. Krypt	on; Kr; 7439-	90-9	Weiss, R.	. F.; Kyser, T.	к.
2. Water	; н ₂ 0; 7732-1	8-5	<u>J. Chem</u> .	Eng. Data 1978	3, <u>23</u> , 69-72.
ARIABLES:			PREPARED BY		
17	′K: 273.72 -	313.25		R. Battino	
XPERIMENTAL	VALUES:		.I	······································	
Т/К	Mol Fraction $X_1 \times 10^5$	Bunsen Coefficient a	T/K	Mol Fraction $X_1 \times 10^5$	Bunsen Coefficient
273.72	8.663*		202 20	<u>-</u>	α
273.72	8.673*	0.10778 0.10790	293.39 293.40	5.009* 5.013*	0.06221 0.06226
273.74	8.663*	0.10778	304.12	3.999*	0.04953
273.73	8.669	0.10786	304.13	4.003*	0.04957
283.48 283.47	6.416	0.07981	304.13	4.001*	0.04955
283.47	6.420 6.415	0.07985 0.07979	304.12 313.24	4.006* 3.414*	0.04961 0.04215
293.39	5.010*	0.06222	313.25	3.417*	0.04218
293.39 293.40	5.008* 5.014*	0.06220 0.06227	313,25	3.415*	0.04216
	······································				
			INFORMATION		
	ARATUS/PROCEDU	RE:	SOURCE AND	PURITY OF MATERIA	
Gas-fre are equili- samples of phases are solved in the number special me emoval of jumber of gaseous ph	ee water and t ibrated, and v f the liquid a e isolated. T the water is c of moles det ercury manomet f the water va	RE: the pure gas columetric and gaseous the gas dis- extracted and ermined on a er. After por, the sample of the ed with the	SOURCE AND 1. Krypto greate chroma less	PURITY OF MATERIA on. Matheson Ga er than 99.995 atographic chec than 0.01 % ain Distilled.	as Products. % pure. Gas cks showed
Gas-fre are equili- samples of phases are solved in the number special me removal of paseous ph gaseous ph same manon pressure (solution m gas correc maximum er	ee water and t ibrated, and v f the liquid a e isolated. T the water is c of moles det ercury manomet f the water va moles in the tase is measur meter; from wh (and fugacity) hay be calcula ctions are mad eror is 0.02%.	RE: the pure gas columetric and gaseous the gas dis- extracted and ermined on a er. After por, the sample of the ed with the ich the above the ted. Real e. Predicted No drawings	SOURCE AND 1. Krypto greate chroma less	on. Matheson Ga er than 99.995 atographic cheo than 0.01 % ain Distilled.	as Products. % pure. Gas cks showed

COMPONENTS	:		ORIGINAL MEASUREMENT	S:
	>ton; Kr; 7439-9	0-9	Anderson, C. J.;	
Kryr	oton-85; ⁸⁵ Kr; 1	3093-27-2	Klach, S. J.	
			J. Chem. Eng. Da	ata 1962, <u>7</u> , 290-294.
2. Wate	er; H ₂ O; 7732-18	-5		
VARIABLES:		······	PREPARED BY:	
	т/к: 373.15 -		A.L. C	Iramer
Kr P/kPa	a: 1.0135 x 10		H.L. C	lever
VDPDTM		60.6×10^{-4} psia		
T/K	AL VALUES:	re/psia	Henry's Constant	Mol Fraction
-/.	<u> </u>		-	$x_1 \times 10^5$
	$\begin{array}{r} \text{Total} \\ \text{O}_2 + \text{H}_2 \text{O} + \text{Kr} \end{array}$	Partialx 10 ⁴ Kr	$K = (P/psia)/X_1$	at 101.325 kPa Kr
373.15	270	1.99	6.63×10^5	2.22
	400	60.6	6.00 x 10 ⁵	2.45
398.15	280	1.53	5.88 x 10^{5}	2.50
	400	60.4	5.86 x 10 ⁵	2.51
423.15	295	1.68	5.42 x 10 ⁵	2.71
	410	55.4	5.18 x 10 ⁵	2.84
453.15	400	40.4	4.83×10^{5}	3.04
473.15	435	1.47	3.87×10^{5}	3.80
523.15	1000	32.0	2.67 x 10^{5}	5.51
	1340	3.48	2.54×10^{5}	5.79
	1410	6.6	2.64 x 10^{5}	5.57
548.15	1560	2.77	2.01 x 10^{5}	7.31
	1615	6.03	1.63×10^{5}	9.02
573.15	1860	2.67	1.21×10^{5}	12.2
	1930	5.27	1.22×10^5	12.1
The mole	fraction solub ulated by the c	ility at a par-	tial pressure of l	01.325 kPa krypton
			INFORMATION	
METHOD /AD				
	PARATUS/PROCEDU ⁸⁵ Kr stock mixt		SOURCE AND PURITY OF	MATERIALS;
	parately to a t			
stainles	s steel vessel	containing		
about 27 time var	5 ml of water. ied from 1.5 to	Equilibration		
	eciable differe			
	went for 64 ho ium both liquid			
were sam	pled and the kr	ypton in each		
phase wa 85.	s determined by	counting the		
85 _{Kr} tag	•			
Henry temperat	's law constant ure. The autho	is linear in rs give	At the 95% conf certainity in K	idence level the un-
K = (p/p	$sia)/X_1 = (0.12)$	6-0.0263 C))x 10 ⁵		$0.0677 - (T - 202)^2/$
			$\delta T/K = 0.1$	75334
with a s $0.218 \times$	tandard deviati	on or		
0.218 X	IU .			
			1	

COM 1. 2.	PONENTS: Krypton; Kr; 7439-90-9 Krypton-85; ⁸⁵ Kr; 13983-27-2 Water; H ₂ 0; 7732-18-5	ORIGINAL MEASUREMENTS: Anderson, C. J.; Keeler, R. A.; Klach, S. J. J. <u>Chem. Eng. Data</u> 1962, <u>7</u> , 290-294.
	-	Continued from previous page.

Smoothed data: A graph of the krypton mole fraction solubility at a partial krypton pressure of 101.325 kPa was constructed using the solubility data at temperatures between 273 and 348 K used in the critical evaluation of krypton + water, as well as the data from this paper. The data give a single smooth curve with a minimum near 380 K.

The thirty data points used in the critical evaluation of krypton solubility at temperature below 348 K and the 15 data points from the present paper were combined in a linear regression to obtain the equation

 $\ln x_1 = -61.52677 + 82.72769/(T/100) + 21.7672 \ln (T/100)$

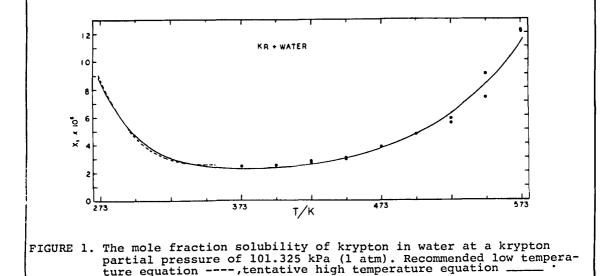
The equation is a tentative equation for use between 373.15 and 573.15 K. It is not recommended for use at lower temperatures. It gives a mole fraction solubility at 273.15 K that is 3.3% lower, at 293.15 K 0.02% lower, and 348.15 K 2.5% higher than the recommended equation for that temperature interval.

Smoothed values of the mole fraction solubility, Ostwald coefficients, Gibbs energy, enthalpy and entropy of solution at 25 K intervals between 373.15 and 573.15 K are given in Table 1. A comparison of the two equations and the data from this paper is given in Figure 1.

TABLE 1. Tentative values of the solubility of krypton in water at a krypton partial pressure of 101.325 kPa and values of the thermodynamic properties on solution between 373.15 and 573.15 K.

	$_{1 \times 10^{5}}$	Coefficient	∆G ^O /kJ mol ⁻¹	ΔH ^O /kJ mol ⁻¹	ΔS ^O /J K ⁻¹ mol
373.15	2.27	0.0370	33.18	-1.25	-92.3
398.15	2.31	0.0394	35.33	+3.27	-80.5
423.15	2.55	0.0451	37.21	+7.80	-69.5
448.15	2.99	0.0545	38.81	+12.3	-59.1
473.15	3.68	0.0684	40.17	+16.8	-49.3
498.15	4.69	0.0884	41.28	+21.4	-40.0
523.15	6.16	0.116	42.17	+25.9	-31.1
548.15	8.27	0.155	42.84	+30.4	-22.7
573.15	11.3	0.207	43.31	+34.9	-14.6

 ΔC_p^{o} is constant with a value of 181. J K⁻¹ mol⁻¹.



8

COMPONENTS : EVALUATOR: 1. Krypton; Kr; 7439-90-9 H. L. Clever Chemistry Department 2. Sea Water Emory University Atlanta, GA 30322 U.S.A. CRITICAL EVALUATION: There are three reports of the solubility of krypton in sea water. König (1) reports krypton solubility values at eight temperatures between 273.15 and 297.15 K. Wood and Caputi (2) report krypton solubility values at three temperatures between 274.45 and 321.25 K. Weiss and Kyser (3) report three to five krypton solubility values at each of seven temperatures between 273.23 and 313.25 K.

Weiss and Kyser appear to have carried out the most reliable work and we recommend use of their values. Weiss and Kyser corrected these data for the real molar value of krypton and for the fugacity of the krypton. The Their equation for the Bunsen solubility coefficient of krypton, corrected for nonideal behavior, is given by the equation

 $\ln[Bunsen] = -57.2596 + 87.4242(100/T) + 22.9332 \ln(T/100)$

+ $S_{\circ}[-0.008723 - 0.002793(T/100) + 0.0012398(T/100)^2]$

where T is the absolute temperature and S% is the salinity in parts per thousand.

Weiss and Kyser give equations for the solubility of krypton from moist air at 101.325 kPa (1 atm) total pressure in units of $cm^3 Kr(STP) dm^{-3}$ sea water and $cm^3 Kr(STP) kg^{-1}$ sea water assuming that krypton mole fraction in dry air is 1.141×10^{-6} (4). The equations are

 $\ln[\text{cm}^3 \text{ Kr}(\text{STP}) \text{ dm}^{-3}] = -109.9320 + 149.8152(100/\text{T}) + 72.8393 \ln(\text{T}/100)$

- 9.9217(T/100) + S%o[-0.006953 - 0.004085(T/100) + 0.0014759(T/100)²]

and

 $\ln[\text{cm}^3 \text{Kr}(\text{STP}) \text{kg}^{-1}] = -112.6840 + 153.5817(100/\text{T}) + 74.4690 \ln(\text{T}/100)$

 $-10.0189(T/100) + S_{\circ}[-0.011213 - 0.001844(T/100) + 0.0011201(T/100)^{2}]$

Extensive tables of krypton Bunsen coefficients and $cm^3 Kr(STP) kg^{-1}$ as a function of temperature and salinity as calculated from the above equations are given in the original paper.

Weiss and Kyser compare the earlier work with their results. They show that teh Köenig data are as much as 14 per cent lower at low temperatures and that the Wood and Caputi data averages 1.9 percent lower than their own data at 274.45 and 299.55 K. Data sheets follow for both the Weiss and Kyser and the Wood and Caputi solubility values. The Wood and Caputi values extend the temperature range another seven degrees.

- 1.
- 2.
- Köenig, H. Z. <u>Naturforsch.</u> 1963, <u>18a</u>, 363. Wood, D.; Caputi, R. <u>USNRDL-TR-988</u>, Feb. 1966. Weiss, R. F.; Kyser, T. K. J. Chem. Eng. Data, 1978, 23, 69. з.
- Glueckauf, E.; Kitt, G. A. Proc. Roy. Soc. London, 1956, 234A, 557. 4.

OMPONENTS:			ORIGINAL ME.	ASUREMENTS:	
1. Kryptor	1; Kr; 7439-90)-9	Weiss, R.	F.; Kyser, T	г. к.
2. Sea Wat	er				
			<u>J. Chem</u> .	Eng. Data 197	78, <u>23</u> , 69 - 72
ARIABLES:			PREPARED BY	•	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			A. L. Crame	er
XPERIMENTAL V	ALUES:	Salin	ity/º/00		
).0	19	.046	36.5	595
Т/К	Bunsen/a	T/K	Bunsen/a	T/K	Bunsen/a
273.74 273.72 273.72 273.73	0.10778 0.10778 0.10790 0.10786			273.24 273.22 273.24 273.23	0.08451 0.08438 0.08442 0.08444
283.48	0.07981	278.05 278.05 278.05	0.08200 0.08212 0.08220	278.47 278.46 278.47	0.07198 0.07204 0.07193
283.47 283.47 293.39 293.39 293.40	0.07985 0.07979 0.06222 0.06220 0.06227	278.05	0.08220	283.57 283.57 283.56 288.25	0.06273 0.06276 0.06270 0.05566
293.40 293.39 293.40 304.12	0.06221 0.06226 0.04953			288.25 288.25 293.49 293.49	0.05547 0.05554 0.04920 0.04933
304.13 304.13 304.12	0.04957 0.04955 0.04961	303.23 303.23 303.23	0.04525 0.04510 0.04517	293.49 303.11 303.12 303.11	0.04935 0.04084 0.04093 0.04085
313.24 313.25 313.25	0.04215 0.04218 0.04216	303.23	0.04532	313.25 313.25 313.25 313.24	0.03475 0.03469 0.03481 0.03475
		AUXILIA	RY INFORMATION		
the Schola nique as u minor modu	ander microgas used by Dougla ification by N	sometric tec as (1), with Weiss (2).	h-l. Krypt > 99. graph air.	995 % pure.	RIALS: n Gas Products. Gas chromato- owed = 0.01 %
keai kryp used and a applied.	ton molar volu a fugacity co:	rrection was	2. Sea W face, salin 0.45	evaporated to ity ~ 2 %, ,pa μ millipore i	assed through
chamber, o	CEDURE: An equi containing pur n water vapor	re gas satu-	ESTIMATED E	δT/K =	0.01 ty = 0.004
by mercury containing ratus is t ing degase equilibriu	y from a close g degassed wa tipped on its sed water to a um chamber. I	ed side cham ter. The ap side, allow flow into th Dissolution	ber pa REFERENCES e 1. Doug is 1964		Phys. Chem.
атаеа ру г	nechanical sha	17THA •	2. Weis		Chem. Eng. Dat

OMPONENTS	;		ORIGINAL MEASU	REMENTS :	
l. Kr	ypton; Kr; 7439-90	-9	Wood, D.; Ca	aputi, R.	
	a Water				
			USNRDI	-TR-988, 27 F	eb. 1966
				. 1967, <u>66</u> , 11	
ARIABLES	:		PREPARED BY:		
P	T/K: 274.45 - 32 /kPa: 101.325 (1			A. L. Cramer	
XPERIMEN'	TAL VALUES:		I		
	Henry's Constant	Percent	Number of	Mol Fraction	
	$K = (P_1/mmHg)/X_1$	Error*	Determinations	$x_{1} \times 10^{3}$	Coefficient a
	- <u></u>	Water; H	H ₂ O; 7732-18-5		
274 45	0.866×10^{7}	0.3	3	0.0878	0.1098
298.15 320.95	1.653×10^{7} 2.340 × 10 ⁷	0.4 2.1	2 4	0.0450 0.0325	0.0571
		ial Sea Wa	ater(1); S%o = 3	34.727	
274.45	1.181×10^{7} 2.163 × 107	0.3	2 2	0.0644 0.0351	0.0803 0.0435
299.55	2.163×107	0.1	2	0.0351	0.0335
320.35 * Perce by aver The mol constan mole fr	2.792 x 10 ⁷ ent error is the ma rage Henry's consta e fractions were c it. The Bunsen coe actions using a so lensities from the	ximum sprent. alculated fficients lvent mean	ead in Henry's of by the compiler were calculcate molecular weig	constant times from the ave ed by the comp ght of 18.4823	erage Henry's biler from th
320.35 * Perce by aver The mol constan mole fr	2.792 x 10' ent error is the ma rage Henry's consta e fractions were c ot. The Bunsen coe ractions using a so	ximum sprent. alculated fficients lvent mean	ead in Henry's of by the compiler were calculcate molecular weig	constant times from the ave ed by the comp ght of 18.4823	erage Henry's biler from th
320.35 * Perce by aver The mol constan mole fr	2.792 x 10' ent error is the ma rage Henry's consta e fractions were c ot. The Bunsen coe ractions using a so	ximum sprent. alculated fficients lvent mean Internatio	ead in Henry's of by the compiler were calculcate molecular weig	constant times from the ave ed by the comp ght of 18.4823	erage Henry's biler from th
320.35 * Perce by aver The mol constan mole fr water d	2.792 x 10' ent error is the ma rage Henry's consta e fractions were c ot. The Bunsen coe ractions using a so	ximum sprent. alculated fficients lvent mean Internatio	ead in Henry's of by the compiler were calculcate molecular weig onal Critical Ta	constant times from the ave ed by the comp ght of 18.4823	erage Henry's biler from th 3 and sea
320.35 * Perce by aver The mol constant mole fr water d METHOD/AF Degas an evac and gas system to ecui was cirr flowing saddles	2.792 x 10' ent error is the ma rage Henry's consta the fractions were c ent. The Bunsen coe ractions using a so lensities from the	ximum sprent. alculated fficients lvent mean Internation AUXILIA oduced internation 50 µ Hg) . After was admit the wate: e column, mm Berl 4-5 hr.	ead in Henry's of by the compiler were calculcate molecular weig onal Critical Ta ARY INFORMATION SOURCE AND PUR to 1. Krypton 0.015% the 0.0001 of ted tography c	constant times c from the ave ed by the comp ght of 18.4823 ables. ITY OF MATERIALS . AIRCO. Cen Xe. Air conta determined by Y. Distilled thm gassing. er. Artificia	erage Henry's biler from th and sea : : : : : : : : : : : : : : : : : : :

COMP	ONENTS:	EVALUATOR:
1.	Krypton; Kr; 7439-90-9	H. L. Clever Chemistry Department
2.	Water; H ₂ O; 7732-18-5	Emory University Atlanta, GA 30322
3.	Electrolyte	U. S. A.
		September 1978

CRITICAL EVALUATION:

The solubility of krypton in aqueous electrolyte solutions.

The results of studies of the solubility of krypton in aqueous salt solution can be classified as no better than tentative. Körösy (1) reports a solubility of krypton in aqueous 20 weight per cent $CaCl_2$ solution which

is of dubious value. Morrison and Johnstone (2) report Setschenow salt effect parameters for 13 aqueous electrolyte solutions. All of their values are based on only one measurement in a one molal salt solution. Although Morrison and Johnstone's Setschenow parameter values for other gases usually accord well with the results of more extensive studies of other workers, their values based on only one measurement in an electrolyte solution must be classed as tentative.

Yeh and Peterson (3), Kitani (4), and Kirk, Parrish and Morken (5) have measured the solubility of krypton in 0.9 weight percent NaCl solution. Kirk <u>et al</u>. did not report a krypton solubility in water so it is not possible to convert their solubility value to a Setschenow parameter. The Setschenow salt effect parameters for krypton in aqueous NaCl solutions from the data of Morrison and Johnstone, Yeh and Peterson, and Kitani do not agree well (Table 1). The values based on Yeh and Peterson's data appear to be high and somewhat erratic as a function of temperature. The values of Morrison and Johnstone and of Kitani are probably more reliable.

Anderson, Keeler and Klach (6) measured the solubility of krypton in water, and in aqueous solution containing UO_2SO_4 , $CuSO_4$ and H_2SO_4 at temperatures between 373 and 573 K. They found no statistical difference in the Henry's constant of krypton in water and in a solution that was $0.02 \text{ mol dm}^{-3} UO_2SO_4$, $0.005 \text{ mol dm}^{-3} CuSO_4$ and $0.005 \text{ mol dm}^{-3} H_2SO_4$. There were differences in the Henry's constant for krypton in water and in a little more concentrated solution containing $0.04 \text{ mol dm}^{-3} UO_2SO_4$, $0.01 \text{ mol dm}^{-3} CuSO_4$ and $0.01 \text{ mol dm}^{-3} H_2SO_4$.

COMPONENTS:			EVALUATOR:			
1. Krypton	; Kr; 743	9-90-9	H. L. Clever Chemistry Department			
2. Water;	н ₂ 0; 7732	-18-5	Emory University	lient		
3. Electro	-		Atlanta, GA 30322 U. S. A.			
			September 1978			
CRITICAL EVALUA	ATION:					
Electrolyte	T/K	mol salt Kg ⁻¹ H ₂	$ k_{s} = (1/m) \log (S^{O}/S) $	$\frac{K_{sx}}{(1/m)\log(X^{O}/X)}$	Ref	
NH ₄ Cl	298.15	1.0	0.065	0.080	2	
(CH ₃) 4NI	298.15	1.0	-0.016	-0.001	2	
(C ₂ H ₅) ₄ NBr	298.15	1.0	-0.032	-0.017	2	
HCI	298.15	1.0	0.028	0.043	2	
HNO 3	298.15	1.0	-0.003	0.012	2	
BaCl,	298.15	1.0	0.151	0.174	2	
LiCl	298.15	1.0	0.116	0.131	2	
NaCl	298.15	1.0	0.146	0.161	2	
	298.15	0.155	0.195	0.210	3	
	303.15	0.155	0.216	0.231	3	
	310.15	0.155	0.224	0.239	3	
	310.15	0.155	0.137	0.152	4	
	310.15	0.155	*		5	
	318.15	0.155	0.197		3	
Na2SO4	298.15	1.0	0.203	0.226	2	
Na ₃ PO ₄ **	298.15	0.066	0.266		3	
5 -	303.15	0.066	0.287		3	
	310.15	0.066	0.265		3	
	318.15	0.066	0.368		3	
KC1	298.15	1.0	0.124	0.139	2	
KBr	298.15	1.0	0.120	0.135	2	
KI	298.15	1.0	0.120	0.135	2	
кno _з	298.15	1.0	0.093	0.108	2	
uo2so4	373-573	0.02-0.04			6	
3		.05 and 0.20 depe	nding on the value	e of water		
solubility ** The Na_P		tration in mol dm	-3 solution.			
REFERENCES	4					
1. Korossy	, F. <u>Tra</u>	ns. Faraday Soc.	1937, <u>33</u> , 416.			
2. Morriso	n, T. J.;	Johnstone, N. B.	B. J. Chem. Soc	. 1955, 3655.		
3. Yeh, S.	Y.; Pete	rson, R. E. <u>J</u> . <u>P</u>	<u>harm. Sci.</u> 1964,	53, 822.		
4. Kitani,	K. <u>Scan</u>	d. J. Clin. Lab.	Invest. 1972, <u>29</u> ,	167.		
5. Kirk, W	. P.; Par	ish, P. W.; Morke	n, D. A. <u>Health</u> Pl	hysics 1975, <u>28</u> ,	249.	
6. Anderson 1962, <u>7</u>		Keeler, R. A.; K	lach, S. S. <u>J</u> . <u>Cl</u>	hem. Eng. Data		

COMPONENTS :	
	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Morrison, T.J.; Johnstone, N.B.B.
2. Water; H ₂ O; 7732-18-5	
3. Ammonium Chloride; NH ₄ Cl; 12125-02-9	<u>J</u> . <u>Chem</u> . <u>Soc</u> . 1955, 3655-3659.
VARIABLES :	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	I
m/r $h = (1/r) log (2)$	$^{\circ}/S)$ k _{SX} = (1/m) log (X $^{\circ}/X)$
T/K $K_s = (1/m) \log (s)$	$r_{SX} = (1/m) 10g (x/x)$
298.15 0.065	0.080
of krypton in pure water, S^{O} , and the equivalent of salt per kg of water so given in the paper. The S^{O}/S ratio w one kg of water. The compiler calcul from the mole fraction solubility rat	lution, S. No solubility values are as referenced to a solution containing ated the salt effect parameter k_{SX}
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Gas absorption in a flow system.	1. Krypton. British Oxygen Co. Ltd.
	2. Water. No information given.
	3. Electrolyte. No information given.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 Morrison, T.J.; Johnstone, N.B.B. 2. Water; H₂O; 7732-18-5 3. Ammonium Type Salts J. Chem. Soc. 1955, 3655-3659. VARIABLES: PREPARED BY: T/K: 298.15 T.D. Kittredge P/kPa: 101.325 (1 atm) H.L. Clever EXPERIMENTAL VALUES: $k_{s} = (1/m) \log (s^{o}/s) k_{sX} = (1/m) \log (x^{o}/x)$ T/K N,N,N-Trimethylmethanaminium iodide (Tetramethyl-ammonium iodide); C₄H₁₂NI; 75-58-1 298.15 -0.016 -0.001 N,N,N-Triethylethanaminium bromide (Tetraethylammonium bromide); C₈H₂₀NBr; 71-91-0 298.15 -0.032 -0.017 The values of the Setschenow salt effect parameter, k_s , were apparently determined from only two solubility measurements. They were the solubility of krypton in pure water, S^{O} , and the solubility of krypton in a near one equivalent of salt per kg of water solution, S. No solubility values are given in the paper. The S^{O}/S ratio was referenced to a solution containing one kg of water. The compiler calculated the salt effect parameter k_{SX} from the mole fraction solubility ratio X^{O}/X . The electrolytes were assumed to be 100 per cont disconting and both participants and which were the solution containing be 100 per cent dissociated and both cation and anion were used in the mole fraction calculation. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: Gas absorption in a flow system. Krypton. British Oxygen Co. Ltd. 1. 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR: APPARATUS / PROCEDURE : The previously degassed solvent $\delta k_{g} = 0.010$ flows in a thin film down an absorption spiral containing the gas plus solvent vapor at a total pressure of **REFERENCES:** one atm. The volume of gas absorbed is measured in attached calibrated Morrison, T.J.; Billett, F. 1. burets (1). J. Chem. Soc. 1952, 3819.

1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS:
$\mathbf{I}_{\mathbf{i}}$ $\mathbf{K}_{\mathbf{i}}$ $\mathbf{V}_{\mathbf{D}}_{\mathbf{i}}$ $\mathbf{U}_{\mathbf{i}}$ $\mathbf{K}_{\mathbf{i}}$ $\mathbf{I}_{\mathbf{i}}$ $\mathbf{I}_{\mathbf{i}}$ $\mathbf{I}_{\mathbf{i}}$ $\mathbf{I}_{\mathbf{i}}$ $\mathbf{I}_{\mathbf{i}}$	Morrison, T.J.; Johnstone, N.B.B.
2. Water; H ₂ O; 7732-18-5	
3. Acids	
S. ACIDS	T Cham Dog 1055 2655 2650
	<u>J. Chem</u> . <u>Soc</u> . 1955, 3655-3659.
VARIABLES:	PREPARED BY:
T/K: 298.15	T.D. Kittredge
P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	······································
T/K $k_{s} = (1/m) \log (S^{O}/S)$	$k_{} = (1/m) \log (X^{O}/X)$
	sx (-, -, -, -, -, -, -, -, -, -, -, -, -, -
Hydrochloric Acid; HCl; 7647-0	01-0
298.15 0.028	0.043
Nitric Acid; HNO ₃ ; 7697-37-2	
298.15 -0.003	0.012
	0.012
of krypton in pure water, S ^O , and the equivalent of salt per kg of water so	lution, S. No solubility values are as referenced to a solution containing ated the salt effect parameter k_{SX} io X^O/X . The electrolytes were
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd.
ME THOD:	SOURCE AND PURITY OF MATERIALS:
METHOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information
METHOD:	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given.
ME THOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given.
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus solvent vapor at a total pressure of	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:</pre>

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Krypton; Kr; 7439-90		Anderson, C. J.; Kee	ler, R. A.;
Krypton-85; ⁸⁵ Kr; 13	3983-27-3	Klach, S.J.	-
2. Water; H ₂ O; 7732-18-	-5		
3. Uranium dioxosulfato	o-(Uranyl sul-	J. Chem. Eng. Data 1	962, <u>7</u> , 290-294.
fate); U02SO4;1314-0	54-3		
4. Copper sulfate; CuSC	0 ₄ ; 7758-98-7		
4. Copper sulfate; CuSC 5. Sulfuric Acid; H ₂ SO	4; 7664-93-9		
VARIABLES: T/K: 373.15 - 1	578 15	PREPARED BY:	
Kr P/pa: 0.407 - 30	5,680	A.L. Cram	
Kr P/pa: $0.407 - 30$ (0.59 - 53.2 x 10	⁴ psia)	H.L. Clev	er
EXPERIMENTAL VALUES:			
T/K Press	ure/psia	Henry's Constant	Mol Fraction
Total	Partial x 10 ⁴	$K = (p/psia)/X_1$	$x_{-} \times 10^{5}$
$O_2 + H_2O + Kr$	Kr	v · · · 10 ⁻⁵	
<u></u>	····	$\frac{K \times 10}{-2}$	$\frac{101.325 \text{ kPa Kr}}{-2}$
$0.02 \text{ mol dm}^{-3} \text{ UO}_{2}$	SO ₄ , 0.005 mol	Henry's Constant $K = (p/psia)/X_1$ $K \times 10^{-5}$ a dm^{-3} CuSO ₄ and 0.005	mol dm ⁻³ H ₂ SO _A
373.15 115	0.93	6.37	2.31 4
365	5.03	6.66	2.21
398.15 110	0.59	5.78	2.54
350	33.9	5.93	2.48
423.15 125	0.40	5.1	2.88
315	28.2	5.20	2.83
523.15 1120	15.0	2.60	5.65
1165 1310	15.0 6.20	2.70 2.80	5.44 5.25
1310	7.20	2.60	5.65
1495	39.0	2.38	6.18
524.15 1095	53.2	2.08	7.07
543.15 1235	44.1	1.75	8.40
548.15 1340	11.0	1.9	7.74
1485	4.20	1.8	8.17
1565	6.00	2.0	7.35
1715	42.9	1.90	7.74
573.15 1577 1665	7.0 9.1	1.0	14.7
1736	3.0	1.1 1.20	13.4 12.3
1870	4.5	1.3	11.3
2015	3.77	1.49	9.87
578.15 1625	2.5	1.01	14.55
*See note below			
<u></u>			
	AUXILIARY	INFORMATION	
METHOD /APPARATUS/PROCED	IDF.	SOURCE AND PURITY OF MATH	FRIAIS.
(85-		1	
A Kr/ ⁸⁵ Kr stock mixture	and O ₂ are	No informatio	n
added separately to a th	hermostated		
stainless steel vessel of			
about 275 ml of solution			
tion time varied from 1		1	
without appreciable diff		1	
sults (one run went for At equilibrium both liqu			
were sampled and the kry		ł	
phase was determined by			
⁸⁵ Kr tag.		1	
Kr tag.			·····
Henry's law constant is		ESTIMATED ERROR: The 95	<pre>% confidence</pre>
temperature. The author	cs give	limits are given by	·····2 *
$K = (9.188 - 0.0267t)^{\circ}C$)x10 ⁵ psia x. ⁻¹	$K \pm 0.357 \times 10^5 [0.0]$	$5 + \frac{(t-230)}{120}$
			130,000]
with a standard deviation line of 0.170 x 10 ⁵ .	on about the	DEPENDENCE	
		REFERENCES:	
The solubility of Kr in	water and in	1	
the uranyl sulfate solut		1	
appears to be the same.		1	
constant for the two set pooled for one equation		*The mole fraction	solubility at a
		krypton partial pro	
$K = (9.162 - 0.0265t/^{\circ}C)x^{2}$	LU ⁻ psia X _l -	kPa was calculated	
L			

OMPONENTS :		1	ORIGINAL MEASUREMENTS: Anderson, C. J.; Ke	olor P A ·
 Krypton Krypton 	; Kr; 7439-90-9 -85; ⁸⁵ Kr; 13983	3-27-3	Klach, S. J.	eiei, k, h.,
2. Water;	H ₂ O; 7732-18-5		•	
3. Uranium fate);	dioxosulfato-(UO ₂ SO ₄ ; 1314-64	(Uranyl sul- -3	J. Chem. Eng. Data	1962, <u>7</u> , 290-294.
	sulfate; CuSO ₄ ;			
	c Acid; H ₂ SO4;			
	к: 373.15 - 57		PREPARED BY:	
Kr P/p	a: 2.261 - 50-	-332	A.L. Cra	
(3.	28 - 73.0 x 10-	⁻⁴ psia)	H.L. Cle	ver
XPERIMENTAL V	ALUES:			
Т/К	Pressure	e/psia	Henry's Constant	Mol Fraction
	Total F	Partial x 10 ⁴	$K = (p/psia)/X_1$	$x_1 \times 10^5$
	2^{+} 2^{-} 2^{-} 12^{-} 12^{-}	KL	K x 10 a	it 101.325 kPa Kr
0.04	mol dm ⁻³ UO ₂ SC	0.01 mol	dm ⁻³ CuSO ₄ , 0.01 mol	$dm^{-3} H_2 SO_4$
373.15	355	29.8	6.31	2.33
	350	7.25	6.20	2.37
	380	68.0	5.96	2.47
423.15	400	27.6	5.19	2.83
	410	6.93 73.0	5.73 5.18	2.57
	445			2.34
523.15	825 860	43.7 5.02	1.90 2.03	7.24
	860	25.1	2.03	6.68
	905	55.7	2.11	6.97
573.15	1440	26.0	0.97	15.15
2/2+12				12.6
573.15	1480	3.28	1.17	
The mole	1480 1485 1505	13.3 36.0 ility at a kr	1.34 0.889 Typton partial pressur	11.0 16.5
The mole	1480 1485 1505 fraction solub	13.3 36.0 ility at a kr	1.34 0.889 Typton partial pressur	11.0 16.5
The mole	1480 1485 1505 fraction solub	13.3 36.0 ility at a kr he compilers.	1.34 0.889 Typton partial pressur	11.0 16.5
The mole kPa was c	1480 1485 1505 fraction solub	13.3 36.0 ility at a kr he compilers. AUXILIARY	1.34 0.889 Typton partial pressur	11.0 16.5
The mole kPa was c	1480 1485 1505 fraction solub alculated by the RATUS/PROCEDURE	13.3 36.0 ility at a kr he compilers. AUXILIARY :	1.34 0.889 Typton partial pressur INFORMATION	11.0 16.5
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ	1480 1485 1505 fraction solub alculated by the ATUS/PROCEDURE stock mixture and rately to a the	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s	1480 1485 1505 fraction solub alculated by the calculated by the calculated by the calculated by the calculated by the calculated by the calculated by the calculated by the calculated by the calculated by the c	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining	1.34 0.889 Typton partial pressur INFORMATION	11.0 16.5
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m	1480 1485 1505 fraction solub alculated by the alculated by the stock mixture as cately to a the steel vessel co al of solution.	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra-	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5 re of 101.325
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app	1480 1485 1505 fraction solub alculated by the alculated by the stock mixture and the steel vessel conduction the steel vessel conduction of solution. varied from 1.5 preciable diffe	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re-	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5 re of 101.325
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one	1480 1485 1505 fraction solub alculated by the alculated by the salculated by the calculated by the salculated from 1.5 preciable differ run went for 6	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours).	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5 re of 101.325
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one A t equilibr	1480 1485 1505 fraction solub alculated by the alculated by the stock mixture and cately to a the steel vessel co al of solution. varied from 1.5 preciable differ run went for 6 cium both liqui	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5 re of 101.325
The mole kPa was c WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was c	1480 1485 1505 fraction solub alculated by the alculated by the salculated by the calculated by the salculated from 1.5 preciable differ run went for 6	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5 re of 101.325
The mole kPa was c WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was c	1480 1485 1505 fraction solub alculated by the alculated by the stal of solution. Varied from 1.5 preciable differ run went for 6 rium both liqui ed and the kryp	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was c ⁸⁵ Kr tag. Henry's lay	1480 1485 1505 fraction solub alculated by the salculated by the stock mixture and the stely to a the stely to a stell stell to a stell to a stell stell to a stell	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT	11.0 16.5
The mole kPa was c WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time w without app sults (one At equilibr were sample phase was c ⁸⁵ Kr tag. Henry's law in temperat	1480 1485 1505 fraction solub alculated by the alculated by the stale by the stock mixture and cately to a the steel vessel co al of solution. varied from 1.5 preciable differ run went for 6 cium both liqui ed and the kryp letermined by c v constant is n cure as it appe	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information	11.0 16.5
The mole kPa was c WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time w without app sults (one At equilibr were sample phase was c ⁸⁵ Kr tag. Henry's law in temperat	1480 1485 1505 fraction solub alculated by the alculated by the stock mixture and the stel vessel conduction. Varied from 1.5 preciable different for 6 run went for 6 rium both liquited and the kryp determined by constant is not a solution.	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information	11.0 16.5
The mole kPa was c METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was c ⁸⁵ Kr tag. Henry's lav in temperat for water a sulfate sol	1480 1485 1505 fraction solub alculated by the alculated by the stock mixture and the stel vessel conduction. Varied from 1.5 preciable different for 6 run went for 6 rium both liquited and the kryp determined by constant is not a solution.	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information	11.0 16.5
The mole kPa was of METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time w without app sults (one At equilibr were sample phase was of 85Kr tag. Henry's law in temperat for water a sulfate sol	1480 1485 1505 fraction solub alculated by the ATUS/PROCEDURE stock mixture and the vessel co al of solution. varied from 1.5 preciable differ run went for 6 frium both liquited and the kryp determined by c v constant is n ture as it apper and the more di lution. alues of K at t	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl he four	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information	11.0 16.5
The mole kPa was of METHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time w without app sults (one At equilibr were sample phase was of 85Kr tag. Henry's law in temperat for water a sulfate sol	1480 1485 1505 fraction solub alculated by the salculated by the s	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl he four	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information ESTIMATED ERROR:	11.0 16.5
The mole kPa was c WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was c ⁸⁵ Kr tag. Henry's lav in temperature for water a sulfate sol The mean va temperature T/K K/P	1480 1485 1505 fraction solub alculated by the salculated by the stock mixture as cately to a the steel vessel co al of solution. varied from 1.5 preciable diffe run went for 6 frium both liqui ed and the kryp determined by c v constant is n ture as it appe and the more di lution. alues of K at t es are psia X ₁ ⁻¹ x 10	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl he four	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information ESTIMATED ERROR:	11.0 16.5
The mole kPa was of WETHOD/APPAF A Kr/ ⁸⁵ Kr sa added separ stainless sa about 275 m tion time v without app sults (one At equilibr were sample phase was of 85 Kr tag. Henry's law in temperature for water a sulfate sol The mean va temperature T/K K/F 373.15 423.15	1480 1485 1505 fraction solub alculated by the salculated by the s	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl he four	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information ESTIMATED ERROR:	11.0 16.5
The mole kPa was of WETHOD/APPAF A Kr/ ⁸⁵ Kr s added separ stainless s about 275 m tion time v without app sults (one At equilibr were sample phase was of ⁸⁵ Kr tag. Henry's lav in temperature for water a sulfate sol The mean va temperature T/K K/F 373.15 423.15 473.15	1480 1485 1505 fraction solub alculated by the salculated by the stock mixture and rately to a the steel vessel co al of solution. varied from 1.5 preciable differ run went for 6 rium both liquined and the kryp determined by c v constant is n ture as it apper and the more di lution. alues of K at t es are psia X ₁ ⁻¹ x 10 (6.16 ± 0.26)	13.3 36.0 ility at a kr he compilers. AUXILIARY : nd O ₂ are rmostated ntaining Equilibra- to 22 hours rence in re- 4 hours). d and vapor ton in each ounting the ot linear ars to be lute uranyl he four	1.34 0.889 Typton partial pressur INFORMATION SOURCE AND PURITY OF MAT No information ESTIMATED ERROR:	11.0 16.5

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9 2. Water; H ₂ O; 7732-18-5	Morrison, T.J.; Johnstone, N.B.B.
3. Barium Chloride; BaCl ₂ ;	
10361-37-2 2	<u>J</u> . <u>Chem</u> . <u>Soc</u> . 1955, 3655-3659.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	T.D. Kittredge H.L. Clever
EXPERIMENTAL VALUES:	L
T/K $k_s = (1/m) \log (k_s)$	s^{o}/s) $k_{sX} = (1/m) \log (x^{o}/x)$
298.15 0.151	0.166
equivalent of salt per kg of water so given in the paper. The S ^O /S ratio wa one kg of water. The compiler calcula from the mole fraction solubility rat: assumed to be 100 per cent dissociated used in the mole fraction calculation	as referenced to a solution containing ated the salt effect parameter k_{SX} to X ^O /X. The electrolyte was and both cation and anion were
AUXILIARY	INFORMATION
	······································
METHOD: Gas absorption in a flow system.	SOURCE AND PURITY OF MATERIALS;
das absorption in a riow system.	1. Krypton. British Oxygen Co. Ltd.
	2. Water. No information given.
	3. Electrolyte. No information given.
APPARATUS / PROCEDURE :	ESTIMATED ERROR:
The previously degassed solvent flows in a thin film down an absorp-	$\delta k_s = 0.010$
tion spiral containing the gas plus	5
tion spiral containing the gas plus solvent vapor at a total pressure of one atm. The volume of gas absorbed is measured in attached calibrated burets (1).	REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1952, 3819.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, S.Y.; Peterson, R.E.
2. Water; H ₂ O; 7732-18-5	
-	
3. Sodium Chloride; NaCl; 7647-14-5	J. Pharm. Sci. 1964, 53, 822 - 824.
VARIABLES:	PREPARED BY:
T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm)	H.L. Clever
1) 11 dl 101000 (1 ddm)	
EXPERIMENTAL VALUES:	
T/K Ostwald $\Delta H^{O}/c$	al mol ⁻¹ $\Delta S^{\circ}/cal K^{-1} mol^{-1}$
Coefficient L	
	5017 -28.9
	252 -26.4 3181 -22.9
	957 -19.0
For comparison, the authors'Ostwald co 0.0539, 0.0481 and 0.0441 at the four	
The sodium chloride solution is 0.9 we mole NaCl kg^{-1} water.	eight percent which is about 0.155
Each solubility value is the average of standard deviation of each measurement	of three or four measurements. The c closely approximates 1.0 per cent.
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co.
METHOD/APPARATUS/PROCEDURE: Freshly boiled solution was intro-	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus.
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade.
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3):	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade.
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): log S = A/T + B log T - C	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade.
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + C)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + C)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + C)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was introduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + C)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Morrison, T.J.; Johnstone, N.B.B.
2. Water; H ₂ O; 7732-18-5	
2 3. Alkali Halides	
J. AIKall hallues	J. Chem. Soc. 1955, 3655-3659.
	<u>5. chem</u> . <u>500</u> . 1955, 5055-5059.
VARIABLES:	PREPARED BY:
T/K: 298.15	T.D. Kittredge
P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K $k_{-} = (1/m) \log (S^{O})$	/S) $k_{SX} = (1/m) \log (x^{O}/X)$
Lithium Chloride; LiCl; 74	
298.15 0.116	0.0131
Sodium Chloride; NaCl; 764	
298.15 0.146	0.161
Potassium Chloride; KCl; 7	
298.15 0.124	0.139
Potassium Bromide; KBr; 77	
298.15 0.120	0.135
Potassium Iodide; KI; 7681 298.15 0.120	0.135
The values of the Setschenow salt effe	
from the mole fraction solubility rat: assumed to be 100 per cent dissociated in the mole fraction calculation.	d and both cation and anion were used
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Gas absorption in a flow system.	1. Krypton. British Oxygen Co. Ltd.
	2. Water. No information given.
	 Electrolyte. No information given.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus	$\delta k_{g} = 0.010$
solvent vapor at a total pressure of	REFERENCES:
one atm. The volume of gas absorbed is measured in attached calibrated burets (1).	1. Morrison, T.J.; Billett, F. <u>J. Chem</u> . <u>Soc</u> . 1952, 3819.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Morrison, T.J.; Johnstone, N.B.B.
2. Water; H ₂ O; 7732-18-5	
 Sodium Sulfate; Na₂SO₄; 	
7757-82-6	J. Chem. Soc. 1955, 3655-3659.
	<u><u><u> </u></u></u>
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (l atm)	T.D. Kittredge
F/KFA: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K k = (1/m) log (S ^C	P/S) $k_{SX} = (1/m) \log (X^{O}/X)$
······································	
298.15 0.203	0.226
equivalent of salt per kg of water sol given in the paper. The S ^O /S ratio wa one kg of water. The compiler calcula from the mole fraction solubility rati assumed to be 100 per cent dissociated in the mole fraction calculation.	as referenced to a solution containing ated the salt effect parameter k_{SX} to X ^O /X. The electrolyte was
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS;
	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd
ME THOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given.
METHOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information
ME THOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given.
ME THOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information
ME THOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information
ME THOD:	SOURCE AND PURITY OF MATERIALS; 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information
ME THOD:	SOURCE AND PURITY OF MATERIALS; 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given.
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:</pre>
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus solvent vapor at a total pressure of one atm. The volume of gas absorbed	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:</pre>
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus solvent vapor at a total pressure of	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR: $\delta k_s = 0.010$ REFERENCES: 1. Morrison, T.J.; Billett, F.
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus solvent vapor at a total pressure of one atm. The volume of gas absorbed is measured in attached calibrated	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:</pre>
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus solvent vapor at a total pressure of one atm. The volume of gas absorbed is measured in attached calibrated	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR: $\delta k_s = 0.010$ REFERENCES: 1. Morrison, T.J.; Billett, F.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, S-Y.; Peterson, R.E.
2. Water; H ₂ O; 7732-18-5	
3. Sodium Phosphate (phosphate buffer); Na ₃ PO ₄ ; 7601-54-9	<u>J. Pharm</u> . <u>Sci</u> . 1964, <u>53</u> , 822 - 824.
VARIABLES:	PREPARED BY:
T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K Ostwald Coefficient ∆H ^O /ca L	al mol ⁻¹ $\Delta S^{\circ}/cal K^{-1} mol^{-1}$
	012 -25.5
	744 -24.6 369 -23.4
	941 -22.0
For comparison, the authors Ostwald co 0.0539, 0.0481 and 0.0441 at the four	Defficients in water were 0.0581, temperatures.
The sodium phosphate solution is an 0 The solution might be better describe	
Each solubility value is the average standard deviation of each measuremen	
	INFORMATION
	· · · · · · · · · · · · · · · · · · ·
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co.
duced into 125 ml. absorption flask of solubility apparatus (1), then	2. Water. Distilled from glass
frozen and boiled under vacuum three times. Water-saturated gas was	apparatus.
introduced and equilibrated (2) and weight of solution was determined.	 Sodium phosphate. Analytical grade.
Thermodynamic constants were calcu- lated from equations (3):	
$\log S = A/T + B \log T - C$	ESTIMATED ERROR:
$\Delta H^{O} = R (-2.3A + BT - T)$	$\delta T/K = 0.05$
$\Delta S^{O} = R(-B-BlnT + 2.3C +$	$\delta P/mmHg = 0.2$ $\delta L/L = 0.01$
$\ln(0.082T) + 1)$	
	REFERENCES:
	 Geffken, G. Z. Physik Chem. 1904, 49, 257.
	 Yeh, S.Y.; Peterson, R.E. J. Pharm. Sci. 1963, <u>52</u>, 453-8. Eley, E.E. Trans. Faraday Soc. 1939, <u>35</u>, 1281.

1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS:
1. MEADOWN WE' ADD	Morrison, T.J.; Johnstone, N.B.B.
2. Water; H ₂ O; 7732-18-5	
2	
3. Potassium Nitrate; KNO ₃ ; 7757-79-1	<u>J. Chem</u> . <u>Soc</u> . 1955, 3655-3659.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	T.D. Kittredge H.L. Clever
EXPERIMENTAL VALUES:	
	/S) $k_{SX} = (1/m) \log (X^{O}/X)$
$1/K$ $K_{s} = (1/M) 100 (S)$	SX = (1/m) 10g (X /X)
298.15 0.093	0.108
one kg of water. The compiler calculate the mole fraction solubility ratio X ⁰	as referenced to a solution containing ated the salt effect parameter k _{SX} from /X. The electrolyte was assumed to cation and anion were used in the mole
AUXILIARY	INFORMATION
	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd.
METHOD:	SOURCE AND PURITY OF MATERIALS:
METHOD:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd.
METHOD: Gas absorption in a flow system.	SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp- tion spiral containing the gas plus	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Ltd. 2. Water. No information given. 3. Electrolyte. No information given.
METHOD: Gas absorption in a flow system. APPARATUS/PROCEDURE: The previously degassed solvent flows in a thin film down an absorp-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. British Oxygen Co. Lto 2. Water. No information given. 3. Electrolyte. No information given. ESTIMATED ERROR:</pre>

COMPONENTS :		ORIGINAL	MEASUREMENTS:
	<pr; 7439-90-9<="" pr<="" th=""><th>Makran</th><th>czy, J.; Megyery-Balog, K.;</th></pr;>	Makran	czy, J.; Megyery-Balog, K.;
2 Pontano. (C ₅ H ₁₂ ; 109-66-0	Rus	z, L.; Patyi, L.
z. rentanc, (5-12/ 105 00 0		
		Hung.	<u>J. Ind. Chem</u> . 1976, <u>4</u> , 269-280
VARIABLES:		PREPARED	BY:
	298.15		
P/kPa:	101.325 (1 atm)		S.A. Johnson
EXPERIMENTAL VALU	JES:		
T/K		Bunsen Coeffici	ent Ostwald Coefficient
	$x_1 \times 10^3$	α	L
298.15	7.85	1.528	1.668
298.15	7.65	1.528	1.000
		AUXILIARY INFORMAT	ION
		SOURCE A	ND PURITY OF MATERIALS:
Volumetric me	thod. The appar ohai, and Sipos	SOURCE A atus of Both t (1) was cal gr	ND PURITY OF MATERIALS: the gas and liquid were analyti tade reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The appar ohai, and Sipos	SOURCE A atus of Both t (1) was cal gr foreig	ND PURITY OF MATERIALS: the gas and liquid were analyti tade reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The appar ohai, and Sipos	SOURCE A atus of Both t (1) was cal gr foreig	ND PURITY OF MATERIALS: :he gas and liquid were analyti
Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was cal gr foreig tion.	ND PURITY OF MATERIALS: the gas and liquid were analyti tade reagents of Hungarian or
Volumetric me Bodor, Bor, M	ohai, and Sipos	SOURCE A Both t (1) was cal gr foreig tion.	ND PURITY OF MATERIALS: the gas and liquid were analyti ade reagents of Hungarian or yn origin. No further informa-
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was cal gr foreig tion.	ND PURITY OF MATERIALS: the gas and liquid were analyticade reagents of Hungarian or gn origin. No further informa-
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was foreig tion. ESTIMATE	ND PURITY OF MATERIALS: the gas and liquid were analyticade reagents of Hungarian or gn origin. No further informa- ED ERROR: $\delta X_1/X_1 = 0.03$ CES:
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was foreig tion. ESTIMATE	ND PURITY OF MATERIALS: the gas and liquid were analyticade reagents of Hungarian or gn origin. No further informa- ED ERROR: $\delta X_1/X_1 = 0.03$ CES: bodor, E.; Bor, Gy.; Mohai, B.;
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was foreig tion. ESTIMATE REFERENC 1. BC	ND PURITY OF MATERIALS: the gas and liquid were analyticade reagents of Hungarian or gn origin. No further informa- ED ERROR: $\delta X_1/X_1 = 0.03$ CES: bdor, E.; Bor, Gy.; Mohai, B.; Sipos, G.
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was foreig tion. ESTIMATE REFERENC 1. BC Ve 19	ND PURITY OF MATERIALS: the gas and liquid were analytic ade reagents of Hungarian or gn origin. No further informa- ED ERROR: $\delta X_1/X_1 = 0.03$ CES: odor, E.; Bor, Gy.; Mohai, B.; Sipos, G. eszpremi Vegyip. Egy. Kozl. 957, 1, 55.
Volumetric me Bodor, Bor, M used.	ohai, and Sipos	SOURCE A Both t (1) was foreig tion. ESTIMATE REFERENC 1. BC Ve 19	ND PURITY OF MATERIALS: the gas and liquid were analyticade reagents of Hungarian or gn origin. No further informa- ED ERROR: $\delta X_1/X_1 = 0.03$ CES: bdor, E.; Bor, Gy.; Mohai, B.; Sipos, G. eszpremi Vegyip. Egy. Kozl.

COMPONENTS:	EVALUATOR:
l. Krypton; Kr; 7439-90-9 2. Hexane; C ₆ H ₁₄ ; 110-54-3	H. L. Clever Chemistry Department Emory University Atlanta, GA 30322
	U.S.A.

CRITICAL EVALUATION:

The solubility of krypton in hexane at 101.325 kPa was measured in three laboratories. Clever, Battino, Saylor and Gross (1) report three solubi-lities between 289.30 and 313.75 K. Steinberg and Manowitz (2) report solubilities at 183.15 and 298.15 K. Makranczy, Megyery-Balog, Rusz, and Patyi (3) report a solubility at 298.15. The solubility values near 298.15 K from the three laboratories differ by about 30 percent.

Clever et al. probably used materials of better purity than the materials used by Steinberg and Manowitz. The single value of Makranczy et al. is difficult to judge, but their results tend to scatter for other gases dissolved in hydrocarbons. The values of Clever et al. are to be prefer-red for the 288.15 - 313.15 K temperature range. The smoothed data is given on the Clever et al. data sheet which follows this page.

The 183.15 K solubility value of Steinberg and Manowitz and the three solubility values of Clever et al. were combined in a linear least squares fit to an equation for the Gibbs energy of solution as a function of temperature. The result is a highly tentative equation for the 183.15 -313.15 K temperature interval.

The tentative values for the transfer of one mole of krypton from the gas at a pressure of 101.325 kPa to the hypothetical unit mole fraction solution are

 $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = -3,340.9 + 52.564 T$

Std. Dev. $\Delta G^{\circ} = 63$, Coef. Corr. = 0.9998

 $\Delta H^{\circ}/J \text{ mol}^{-1} = -3,340.9, \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -52,564$

The tentative solubility values and the Gibbs energy of solution at 101.325 kPa as a function of temperature are in Table 1.

Solubility of krypton in hexane. Tentative values of the mole TABLE 1. fraction solubility and Gibbs energy at 101.325 kPa (1 atm) as a function of temperature.

т/к	Mol Fraction $X_1 \times 10^3$	∆G°/J mol ⁻¹
183.15	16.1	6,286.3
203.15	13.0	7,337.6
223.15	10.9	8,388.9
243.15	9.38	9,440.2
263.15	8.27	10,491
273.15	7.82	11,017
283.15	7.42	11,543
293.15	7.07	12,068
298.15	6.91	12,331
303.15	6.76	12,594
313.15	6.48	13,120

- Clever, H. L.; Battino, R.; Saylor, J. H.; Gross, P. M. J. Phys. Chem. 1. 1957, <u>61</u>, 1078.
- 2.
- Steinberg, M.; Manowitz, B. Ind. Eng. Chem. 1959, 51, 47. Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. Hun Hung. J. Ind. з. Chem. 1976, 4, 269.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
2. Hexane; C ₆ H ₁₄ ; 110-54-3	
	<u>J. Phys</u> . <u>Chem</u> . 1957, <u>61</u> , 1078-1083.
VARIABLES:	PREPARED BY:
T/K: 289.30 - 313.75	
P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient α L
289.30 7.48	1.30 1.38
298.25 6.76 313.75 6.40	1.16 1.27 1.07 1.23
Smoothed data: $\Delta G^{\circ} = -RTlnx_1 = -4,560$	0.3 + 56.612 T
Std. Dev. $\Delta G^{O} = 58.2$,	
$\Delta H^{O}/J \text{ mol}^{-1} = -4,560.3$	3, $\Delta S^{\circ}/JK^{-1} mol^{-1} = -56.612$
	action $\Delta G^{O}/J \text{ mol}^{-1}$
X, X	
	
288.15 7.4 293.15 7.1	11 11,752 17 12,035
298.15 6.9	95 12,319
303.15 6.3 308.15 6.5	
313.15 6.3	
318.15 6.1	13,451
See the evaluation of the krypton + he tentative Gibbs energy equation and so 183.15 to 313.15 K range.	exane system on page 26 for a plubility values covering the
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The solvent is satu-	1. Krypton. Linde Air Products
rated with gas as it flows through an 8 mm x 180 cm glass helix attached to	Co. Pure grade.
a gas buret. The total pressure of	2. Hexane. Humphrey-Wilkinson,
solute gas plus solvent vapor is maintained at 1 atm as the gas is	Inc. Shaken with H ₂ SO ₄ , washed,
absorbed.	dried over Na, distilled.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	$\delta T/K = 0.05$
The apparatus is a modification of the apparatus of Morrison and Billett	$\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$
(1). The modifications include the	
addition of a helical storage for the solvent, a manometer for a reference	REFERENCES:
pressure, and an extra buret for	1. Morrison, T.J.; Billett, F.
highly soluble gases. The solvent is degassed by a modification of the	<u>J. Chem. Soc. 1948, 2033;</u> ibid. 1952, 3819.
method of Baldwin and Daniel (2).	
	2. Baldwin, R.R.; Daniel, S.G. J. <u>Appl</u> . <u>Chem</u> . 1952, <u>2</u> , 161.
	<u><u>u</u>. <u>npp1</u>. <u>unem</u>. 1952, <u>2</u>, 101.</u>

COMPONENTS :		ORIGINAL MEASUREMENTS:
1. Krypton; Kr	; 7439-90-9	Steinberg, M.; Manowitz, B.
2. Hexane; C ₆ H	; 110-54-3	
6.	14	Ind. Eng. Chem. 1959, 51, 47-51.
		<u>Ind. Eng. Chem</u> . 1999, <u>51</u> , 47-51.
ARIABLES:		PREPARED BY:
T/K:	183.15 - 298.15	H.L. Clever
P/kPa:	101.325 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES	:	
	T/K Mol Fraction	Bunsen Absorption
	$x_1 \times 10^3$	Coefficient Coefficient α β
	183.15 16.0	2.80 2.95
	298.15 5.73	0.995 1.05
rected to 288.1		fficient as the volume of gas, cor- osorbed under a total system pressure vent at 288.15 K.
The mole fracti- the compiler.	on solubilities and Bu	nsen coefficients were calculated by
		xane system see page 26.
	AUXILIARY	INFORMATION
METHOD / APPARATUS		INFORMATION SOURCE AND PURITY OF MATERIALS:
Absorption c	/PROCEDURE: oefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co.
Absorption c	/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade.
Absorption c	/PROCEDURE: oefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co.
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem-</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem-</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem-</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem-</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem-</pre>
Absorption c	/PROCEDURE: oefficient determined	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem- ically pure.
METHOD/APPARATUS Absorption c by a modified M	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem- ically pure. ESTIMATED ERROR:</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem- ically pure. ESTIMATED ERROR:</pre>
Absorption c	/PROCEDURE: oefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technical grade. 2. Hexane. Technically or chem- ically pure. ESTIMATED ERROR:</pre>

AN/DOMINIMA -	
COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Makranczy, J.; Megyery-Balog, K.;
	Rusz, L.; Patyi, L.
2. Hexane; C ₆ H ₁₄ ; 110-54-3	Hung. J. Ind. Chem. 1976, 4, 269-280.
	<u>inding: 0. 11d. citem</u> . 1970, 4, 209-280.
VARIABLES: T/K: 298.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	S.A. Johnson
EXPERIMENTAL VALUES:	
T/K Mol Fra	
X1 x	10° α L
298.15 7.5	3 1.293 1.411
The mole fraction and Bunsen c	oefficient were calculated by the compiler.
See the krypton + hexane evalu	ation on page 26 for the recommended values
of solubility and thermodynami	c change.
	AUXILIARY INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app	SOURCE AND PURITY OF MATERIALS: Daratus Both the gas and liquid were analyti-
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: paratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: baratus Both the gas and liquid were analyti- s (1) cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	Source AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further informa- tion. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipo	Source AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further informa- tion. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES:
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	Source AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further informa- tion. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl. 1957, 1, 55.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The app of Bodor, Bor, Mohai, and Sipc	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl.

COMPONENTS : ORIGINAL MEASUREMENTS: Krypton; Kr; 7439-90-9 1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. Heptane; C7H16; 142-82-5 2. J. Phys. Chem. 1957, 61, 1078-1083 VARIABLES: T/K: PREPARED BY: 289.25 - 313.45 Total P/kPa: 101.325 (1 atm) P.L. Long **EXPERIMENTAL VALUES:** T/K Mol Fraction Bunsen Coefficient Ostwald Coefficient $x_{1} \times 10^{3}$ τ. α 289.25 1.244 7.59 1.175 298.35 7.16 1.197 1.096 313.45 1.097 6.38 0.956 $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln x_1 = -5469.3 + 59.454 T$ Smoothed Data: Std. Dev. $\Delta G^{O} = 14.6$, Coef. Corr. = .9998 $\Delta H^{O}/J \text{ mol}^{-1} = -5469.3, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -59.454$ $\Delta G^{O}/J mol^{-1}$ Mol Fraction T/K $x_1 \times 10^3$ 288.15 7.69 11662 293.15 7.40 11960 298.15 7.12 12257 303.15 6.87 12554 308.15 6.63 12851 313.15 6.41 13149 318.15 6.20 13446 The solubility values were adjusted to a partial pressure of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: Volumetric. The solvent is satu-1. Krypton. Linde Air Products Co. rated with gas as it flows through an Pure grade. 8 mm x 180 cm glass spiral attached to a gas buret. The total pressure of solute gas plus solvent vapor is main-Heptane. Phillips Petroleum Co. 2. Used as received. tained at 1 atm as the gas is absorbed. ADDED NOTE: Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. Hung. J. Ind. Chem. 1976, 4, 269 report an Ostwald coefficient of 1.229 at 298.15 K for this system. The value was not used in the smoothed data fit above. ESTIMATED ERROR: APPARATUS / PROCEDURE : $\delta T/K = 0.05$ The apparatus is a modification of $\frac{\delta P/mmHg}{\delta X_1/X_1} = 0.03$ that of Morrison and Billett (1). The modifications include the addition of a spiral storage for the solvent, a **REFERENCES**: nanometer for a constant reference pressure, and an extra buret for Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; 1. highly soluble gases. The solvent is degassed by a modification of the ibid. 1952, 3819. method of Baldwin and Daniel (2). 2. Baldwin, R.R.; Daniel, S.G. J. Appl. Chem. 1952, 2, 161.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. 2. 3-Methylheptane; C₈H₁₈; 589-81-1 J. Phys. Chem. 1957, 61, 1078-1083 VARIABLES: PREPARED BY: T/K: 289.15 - 313.75 Total P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Bunsen Coefficient Ostwald Coefficient Mol Fraction $X_1 \times 10^3$ α T. 1.038 1.099 289.15 7.40 298.40 7.18 0.995 1.087 0.891 1.024 313.75 6.55 $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln X_{1} = -3844.8 + 54.026 T$ Smoothed Data: Std. Dev. $\Delta G^{\circ} = 25.6$, Coef. Corr. = 0.9993 $\Delta H^{O}/J \text{ mol}^{-1} = -3844.8, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -54.026$ $\Delta G^{O}/J \text{ mol}^{-1}$ Mol Fraction T/K $x_1 \times 10^3$ 288.15 7.50 11723 293.15 7.30 11993 298.15 12263 7.11 303.15 6.93 12533 308.15 6.76 12803 313.15 6.60 13073 6.44 318.15 13344 The solubility values were adjusted to a partial pressure of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: Volumetric. The solvent is satu-1. Krypton. Linde Air Products Co. rated with gas as it flows through an Pure grade. 8 mm x 180 cm glass spiral attached to a gas buret. The total pressure of 3-Methylheptane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na, 2. solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. distilled through a vacuum column. ESTIMATED ERROR: **APPARATUS/PROCEDURE:** $\delta T/K = 0.05$ $\delta P/mmHg = 3$ The apparatus is a modification of $\delta X_1 / X_1 = 0.03$ that of Morrison and Billett (1). The modifications include the addition of a spiral storage for the solvent, a **REFERENCES:** manometer for a constant reference Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; ibid. 1952, 3819. pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification of the method of Baldwin and Daniel (2). Baldwin, R.R.; Daniel, S.G. <u>J. Appl. Chem</u>. 1952, <u>2</u>, 161. 2.

COMPONENTS:	7430 00 0		ORIGINAL MEASUR	
1. Krypton; Kr;	/439-90-9			; Battino, R.; J.H.; Gross, P.M.
2. 2, 3-Dimethy	lhexane; C ₈ H ₁₈ ;		Saylor, t	J.n.; GLOSS, F.M.
584-94-1				
564-94-1				
			J. Phys. Cher	<u>n</u> . 1957, <u>61</u> , 1078-1083
VARIABLES:			PREPARED BY:	······································
	89.15 - 313.65		FREFARED DI;	
Total P/kPa: 1	01.325 (l atm)		1	P.L. Long
,				
EXPERIMENTAL VALUES	:	·		
T/K M	ol Fraction B	unsen (Coefficient	Ostwald Coefficient
-,	$x_1 \times 10^3$	unden		
	<u></u>		α	L
289.15	7.46	1	.056	1.118
297.95	7.04		.987	1.077
313.65	6.54	0	.899	1.032
Smoothed Data:	$\Delta G^{O}/J \text{ mol}^{-1} = -$	 ₽/╹ 1∽ `	x = -3000 c	+ 54 583 T
	Std. Dev. $\Delta G^{O} = 1$			
	$\Delta H^{O}/J \text{ mol}^{-1} = -3$	998.6,	$\Delta s^{O}/J \kappa^{-1} mo$	$1^{-1} = -54.583$
T/K	Mol 1	Fractio	on	∆G ^O /J mol ⁻¹
	v	x 10 ³		···- , ··
	1	× 10		
288.15	•	7.48		11730
293.15		7.27		12002
298.15		7.07		12275
303.15		6.88		12548 12821
308.15 313.15		6.71 6.54		13094
318.15		6.39		13367
(1 atm) by Henry	alues were adjus 's law. icients were cal			essure of 101.325 kPa iler.
		VT1 T A DV	INFORMATION	
	AU.	XILIARY	INFORMATION	
METHOD:			SOURCE AND PURI	TY OF MATERIALS:
	The solvent is s			Linde Air Products Co.
	s it flows through		Pure grad	de.
	ass spiral attac: e total pressure		2. 2,3 - Dime	ethylhexane. Humphrey-
solute gas plus	solvent vapor is	main-		n, Inc. Shaken w/H ₂ SO ₄ ,
tained at 1 atm	as the gas is			dried over Na, distilled
absorbed.				acuum column.
			ESTIMATED ERROR	R:
APPARATUS/PROCEDUR				$\delta T/K = 0.05$
The apparatus	is a modification	on of		P/mmHg = 3
	and Billett (1) clude the addition			$\delta x_1 / x_1 = 0.03$
	for the solvent			
	constant referen		REFERENCES:	m T . Dillatt D
	extra buret for			, T.J.; Billett, F.
	ases. The solve			<u>Soc</u> . 1948, 2033; 52, 3819.
	dification of the		<u> </u>	5., 50
metnod of Baldwi	n and Daniel (2)	•	2. Baldwin,	R.R.; Daniel, S.G.
			J. Appl.	<u>Chem</u> . 1952, <u>2</u> , 161.
			<u>i</u>	

COMPONENTS:	ORIGINAL MEASUREMENTS: Clever, H.L.; Battino, R.;
1. Krypton; Kr; 7439-90-9	Saylor, J.H.; Gross, P.M.
2. 2, 4-Dimethylhexane; C ₈ H ₁₈ ;	_
589-43-5	
	J. Phys. Chem. 1957, 61, 1078-1083.
VARIABLES:	PREPARED BY:
T/K: 289.25 - 313.75	P.L. Long
Total P/kPa: 101.325 (1 atm)	
EXPERIMENTAL VALUES:	I
	oefficient Ostwald Coefficient
	α L
	074 1.137
	010 1.102 916 1.052
Smoothed Data: $\Delta G^{O}/J \mod^{-1} = -RT \ln O$	$X_1 = -3936.0 + 54.058 T$
Std. Dev. $\Delta G^{\circ} = 3.9$, C	coef. Corr. = $.9999$
$\Delta H^{0}/J mol^{-1} = -3936.0,$	$\Delta S^{O}/J \kappa^{-1} mol^{-1} = -54.058$
T/K Mol Fracti	on $\Delta G^{O}/J \text{ mol}^{-1}$
$x_{1} \times 10^{3}$	
288.15 7.76 293.15 7.54	11641 11911
298.15 7.34	12181
303.15 7.15	12452
308.15 6.97 313.15 6.81	12722 12992
318.15 6.65	13262
The solubility values were adjusted to (1 atm) by Henry's law. The Bunsen coefficients were calculate	
AUXILIARY	INFORMATION
ME THOD:	
Volumetric. The solvent is satu- rated with gas as it flows through an	SOURCE AND PURITY OF MATERIALS; 1. Krypton. Linde Air Products Co. Pure grade.
8 mm x 180 cm glass spiral attached to a gas buret. The total pressure of	2. 2, 4-Dimethylhexane. Humphrey-
solute gas plus solvent vapor is main-	
tained at 1 atm as the gas is absorbed.	washed, dried over Na, distilled
	thru a vacuum column.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE: The apparatus is a modification of	$\delta T/K = 0.05$
that of Morrison and Billett (1). The	$\delta P/mmHg = 3$
modifications include the addition of	$\delta x_1 / x_1 = 0.03$
a spiral storage for the solvent, a manometer for a constant reference	REFERENCES :
pressure, and an extra buret for	1. Morrison, T.J.; Billett, F.
highly soluble gases. The solvent is	J. <u>Chem.</u> <u>Soc.</u> 1948, 2033; ibid. 1952, 3819.
degassed by a modification of the method of Baldwin and Daniel (2).	<u>IDIU</u> . 1752, 3019.
	 Baldwin, R.R.; Daniel, S.G. J. <u>Appl. Chem</u>. 1952, <u>2</u>, 161.

COMPONENTS :		ODTOTIVE IMAG	
	0-9	ORIGINAL MEASU	
1. Krypton; Kr; 7439-9			; Battino, R.; J.H.; Gross, P.M.
2. 2, 2, 4-Trimethylpe	entane; C ₈ H ₁₈ ;		
540-84-1			
		J. Phys. Che	<u>em</u> . 1957, <u>61</u> , 1078-1083.
VARIABLES:		PREPARED BY:	
T/K: 289.15 - Total P/kPa: 101.325		1	P.L. Long
	,		
EXPERIMENTAL VALUES:			
T/K Mol Fract		pefficient	Ostwald Coefficient
X ₁ x 10	3 (α	L
289.15 3.49	1.	171	1.24
298.25 7.88	1.0	072	1.171
313.60 7.12		950	1.091
Smoothed Data: $\Delta G^{O}/J$ m	$ol^{-1} = - RT \ln 2$	$x_1 = -5392.8$	+ 58.320 T
	v. $\Delta G^{O} = 8.1$, Co		
	$o1^{-1} = -5392.8,$		
ΔH /J m	01 = -5392.8		
T/K	Mol Fractio	on	$\Delta G^{O}/J mol^{-1}$
	$x_{1} \times 10^{3}$		
288.15	8.54		11412
293.15	8.21		11704
298.15 303.15	7.92 7.64		11995 12287
308.15	7.38		12579
313.15	7.13		12870
318.15	6.90	······································	13162
The solubility values w (1 atm) by Henry's law.	ere adjusted to	a partial p	ressure of 101.325 kPa
The Bunsen coefficients	were calculate	d by the com	biler.
		INFORMATION	
METHOD: Volumetric. The sol	wont is satu-		RITY OF MATERIALS; . Linde Air Products Co.
rated with gas as it fl		Pure gra	
8 mm x 180 cm glass spi a gas buret. The total			-Trimethylpentane. Enjay
solute gas plus solvent			ed as received.
tained at 1 atm as the		4	
APPARATUS / PROCEDURE :		ESTIMATED ERRO	
The apparatus is a m	odification of		$\delta T/K = 0.05$ $\delta P/mmHq = 3$
that of Morrison and Bi	llett (1). The	1	$\delta X_1 / X_1 = 0.03$
modifications include t			+ +
a spiral storage for th manometer for a constan		REFERENCES:	
pressure, and an extra	buret for		n, T.J.; Billett, F. . Soc. 1948, 2033;
highly soluble gases. degassed by a modificat			952, 3819.
method of Baldwin and D		2. Baldwin	, R.R.; Daniel, S.G.
		J. Appl	. <u>Chem</u> . 1952, <u>2</u> , 161.
1			

COMPONENTS:	EVALUATOR:
1. Krypton; Kr; 7439-90-9	H. L. Clever
2. Octane; C ₈ H ₁₈ ; 111-65-9	Chemistry Department Emory University Atlanta, GA 30322
Decane; C ₁₀ H ₂₂ ; 124-18-5	U. S. A.
	October 1978

CRITICAL EVALUATION:

Solubilities in the octane + krypton and decane + krypton systems were reported from three laboratories. Clever, Battino, Saylor and Gross (1) reported solubility values at three temperatures between 289 and 313 K. Both Makranczy, Megyery-Balog, Rusz and Patyi (2) and Wilcock, Battino, Danforth and Wilhelm (3) report one value at or very near 298.15 K.

Octane + Krypton

The solubility values of krypton in octane from the three laboratories at 298.15 K shows a range of values of 3.8 per cent. The value of Wilcock, et al. (3), determined with improved apparatus for degassing and solubility measurement, should be the most reliable value. However, since they report a solubility at only one temperature, we recommend as the tentative values the data of Clever, et al. (2) (Page 36) with the reservation that the smoothed value at 298.15 K may be about one percent high.

Decane + Krypton

The solubility values for krypton in decane at 298.15 K from the three laboratories shows a 4.3 per cent range. The average value from the three laboratories agrees within 0.2 per cent of the value of Clever, et al. (2). We recommend as the tentative solubility values the smoothed data of Clever, et al. (2) (Page 40). The single value of Wilcock, et al. (3) at 298.16 K is $\frac{2}{15}$ per cent higher and may be the most reliable experimental value.

REFERENCES

- 1. Clever, H. L.; Battino, R.; Saylor, J. H.; Gross, P. M. J. Phys. Chem. 1957, 61, 1078.
- Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. Hung. J. Ind. Chem. 1976, 4, 269.
- Chem. 1976, 4, 269. 3. Wilcock, R. J.; Battino, R.; Danforth, W. F; Wilhelm, E. J. Chem. Thermodyn. 1978, 10, 817.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
2. Octane; C ₈ H ₁₈ ; 111-65-9	Saylor, U.H.; GIOSS, F.M.
	T Dhug Chem 1057 (1 1079 1092
	<u>J. Phys. Chem</u> . 1957, <u>61</u> , 1078-1083.
VARIABLES:	PREPARED BY:
T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm)	P.L. Long
1/KIA. 101.525 (1 adm)	L. H. Hong
	l
EXPERIMENTAL VALUES: T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$	α L
<u> </u>	
289.35 7.52	1.05 1.11
298.35 7.06 313.45 6.40	0.974 1.064 0.868 0.996
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln I$	$X_1 = -5046.9 + 58.100 T$
Std. Dev. $\Delta G^{\circ} = 0.2$,	-
	$\Delta S^{\circ}/J K^{-1} mol^{-1} = -58.100$
	action $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ x	
283.15 7.	
293.15 7. 298.15 7.	
303.15 6.	
308.15 6.	
313.15 6.	
318.15 6.	22 13438
Solubility values were adjusted to a	partial pressure of krypton of
101.325 kPa (1 atm).	
The Bunsen coefficients were calcula	ted by the compiler.
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solvent was degassed by a modifi- cation of the method of Baldwin and	1. Krypton. Linde Air Products Co. Pure.
Daniel (1). Saturation apparatus was	
that of Morrison and Billett (2),	2. Octane. Humphrey-Wilkinson,
modified to include spiral storage	Inc. Shaken w/H_2SO_4 , washed,
for the solvent, a manometer for con- stant reference pressure, and an	dried over Na, distilled.
extra buret. Solvent was saturated	
with gas as it flowed through an	
8 mm x 180 cm glass spiral attached	
to a buret.	
	ESTIMATED ERROR:
	$\delta T/K = 0.05$
	$\delta P/mmHg = 3$
	$\delta x_1 / x_1 = 0.03$
	REFERENCES:
	1. Baldwin, R.R.; Daniel, S.G.
	<u>J. Appl. Chem</u> . 1952, <u>2</u> , 161.
	2. Morrison, T.J.; Billett, F.
	J. Chem. Soc. 1948, 2033;
	<u>ibid</u> . 1952, 3819.

COMPONENTS -	ODICINAL MEACUDENERS
COMPONENTS:	ORIGINAL MEASUREMENTS: Makranczy, J.; Megyery-Balog, K.;
1. Krypton; Kr; 7439-90-9	Rusz, L.; Patyi, L.
2. Octane; C ₈ H ₁₈ ; 111-65-9	
	<u>Hung. J. Ind. Chem</u> . 1976, <u>4</u> , 269-280.
VARIABLES: T/K: 298.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	S.A. Johnson
EXPERIMENTAL VALUES:	Bunsen Ostwald
$\frac{T/K Mol \ Fraction}{X_1 \times 10^3}$	Bunsen Ostwald coefficient Coefficient α L
298.15 7.27	1.003 1.095
The mole fraction and Bunsen coefficie	
See the evaluation of the krypton + or recommended Gibbs energy equation and	stane system on page 35 for the
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1) was used.	Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	<pre></pre>
	<u>1957, 1, 55.</u> <u>Chem. Abstr</u> . 1961, <u>55</u> , 3175h.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Wilcock, R.J.;Battino, R.; Danforth, W.F.
2. Octane; C ₈ H ₁₈ ; 111-65-9	
8-18,	
	<u>J.Chem</u> . <u>Thermodyn</u> . 1978, <u>10</u> , 817 - 822.
VARIABLES:	PREPARED BY:
T/K: 298.18 P/kPa: 101.325 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_{1} \times 10^{3}$	α L
298.18 7.001	0.9646 1.053
A preliminary account of this work ap (C.R.) 4th 1975, <u>6</u> , 122-128.	peared in <u>Conf</u> . <u>Int</u> . <u>Thermodyn</u> . <u>Chim</u> .
The solubility value was adjusted to 101.325 kPa (1 atm) by Henry's law.	a partial pressure of krypton of
The Bunsen coefficient was calculated	by the compiler.
See the evaluation of krypton + octan	for the recommended Gibbs energy
equation and smoothed solubility value	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS;
The solubility apparatus is based on the design of Morrison and Billett	
(1) and the version used is described	Purest commercially available.
by Battino, Evans, and Danforth (2).	
The degassing apparatus is that de-	2. Octane. Phillips Petroleum Co.
scribed by Battino, Banzhof, Bogan,	99 mol per cent minimum.
and Wilhelm (3). Degassing. Up to 500 cm of sol-	
vent is placed in a flask of such	
size that the liquid is about 4 cm	
deep. The liquid is rapidly stirred,	
and vacuum is applied intermittently	
through a liquid N ₂ trap until the	ESTIMATED ERROR:
permanent gas residual pressure	$\delta T/K = 0.03$ $\delta P/mmHg = 0.5$
drops to 5 microns. Solubility Determination. The de-	$\delta x_1 / x_1 = 0.005$
gassed solvent is passed in a thin	1° 1
film down a glass spiral tube con-	REFERENCES:
taining solute gas plus the solvent	1.Morrison, T.J.; Billett, F.
vapor at a total pressure of one atm. The volume of gas absorbed is found	J. Chem. Soc. 1948, 2033.
by difference between the initial	2.Battino, R.; Evans, F.D.; Danforth, W.F.
and final volumes in the buret sys-	J.Am.Oil Chem.Soc. 1968, 45, 830. 3.Battino,R.;Banzhof,M.;Bogan, M.;
tem. The solvent is collected in a	Wilhelm, E.
tared flask and weighed.	Anal. Chem. 1971, 43, 806.

······································			
COMPONENTS:		ORIGINAL MEA	SUREMENTS:
1. Krypton; Kr; 7439-90	-9		L.; Battino, R.;
2 Nononos (1 H - 111-9	42	Saylor	, J.H.; Gross, P.M.
2. Nonane; C ₉ H ₂₀ ; 111-8	4-2		
		J. Phys. C	hem. 1957, 61, 1078-1083.
VARIABLES: T/K: 289.50 - 3	13 50	PREPARED BY:	
Total P/kPa: 101.325 (1			P.L. Long
			5
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · ·	l	
T/K Mol Fracti		Defficient	Ostwald Coefficient
$x_1 \times 10^3$,	x	L
			1 017
289.50 7.55 297.95 7.08		960 890	1.017 0.971
313.50 6.52		304	0.923
Smoothed Data: $\Delta G^{O}/J$ mo	$p1^{-1} = - RT \ln 2$	$x_1 = -4544.$	4 + 56.358 T
	$\Delta G^{O} = 14.0, 0$	-	
∆H ^O /J mo	$1^{-1} = -4544.4,$	∆s ^o ∕j k ⁻¹	$mol^{-1} = -56.358$
т/к	Mol Fractio	on	$\Delta G^{O}/J mol^{-1}$
	$x_{1} \times 10^{3}$		
			11005
288.15 293.15	7.58 7.34		11695 11977
293.15	7.12		12259
303.15	6.90		12541
308.15	6.71		12822
313.15	6.52		13104
318.15	6.34		13386
The solubility values we	ere adjusted to	_ a partial	pressure of 101.325 kPa
(1 atm) by Henry's law.		- F	
The Bunsen coefficients	were calculated	d by the co	mpiler.
		1	
	· · · · · · · · · · · · · · · · · · ·		<u> </u>
	AUXILIARY	INFORMATION	
METHOD:		SOURCE AND F	PURITY OF MATERIALS:
Volumetric. The solv		1. Krypto	on. Linde Air Products Co.
rated with gas as it flo		Pure g	rade.
8 mm x 180 cm glass spir			Dhilling Dotroloum Co
a gas buret. The total solute gas plus solvent			e. Phillips Petroleum Co. as received.
tained at 1 atm as the g			
-			
ADDED NOTE: Makranczy, Balog, K.; Rusz,L.; Paty	vi I. Hung. J.	1	
Ind. Chem. 1976, <u>4</u> , 269	report an		
Ostwald coefficient of	0.988 at 298.15		
k for this system. The	value was not		
used in the smoothed day	ta fit above.		
APPARATUS/PROCEDURE:		ESTIMATED E	$\delta T/K = 0.05$
The apparatus is a mo	dification of		$\delta P/mmHg = 3$
that of Morrison and Bil	lett (1). The		$\delta x_1 / x_1 = 0.03$
modifications include th			± ±
a spiral storage for the		REFERENCES:	
manometer for a constant pressure, and an extra b		I	
highly soluble gases. T			son, T.J.; Billett, F. em. Soc. 1948, 2033;
degassed by a modificati			1952, 3819.
method of Baldwin and Da			
			n, R.R.; Daniel, S.G.
		J. App	<u>ol</u> . <u>Chem</u> . 1952, <u>2</u> , 161.

COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Clever, H.L.; Battino, R.;
	Saylor, J.H.; Gross, P.M.
2. Decane. C ₁₀ H ₂₂ ; 124-18-5	
	T phys. chem 1057 61 1079-1093
	<u>J. Phys. Chem</u> . 1957, <u>61</u> , 1078-1083.
VARIABLES:	PREPARED BY:
T/K: 289.75 - 313.35 P/kPa: 101.325 (1 atm)	P.L. Long
P/RPd: 101.525 (1 dum)	Tend Dong
EXPERIMENTAL VALUES:	I
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$	L
289.75 7.59	0.883 0.937
298.15 7.22	0.832 0.908 0.740 0.849
313.35 6.53	
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -4853.9 + 57.311 T$
Std. Dev. $\Delta G^{\circ} = 8.9$,	Coef. Corr. = 0.9999
	$\Delta s^{\circ}/J \kappa^{-1} mol^{-1} = -57.311$
-	action $\Delta G^{O}/J \text{ mol}^{-1}$
T/K Mol Fr X ₁ ×	10^3
	70 11660
293.15 7.	43 11947
298.15 7. 303.15 6.	19 12233 96 12520
308.15 6.	
313.15 6.	55 13093
318.15 6.	36 13380
The solubility values were adjusted t	o a partial pressure of krypton of
101.325 kPa (1 atm) by Henry's law.	o a partiar pressure or krypton or
The Bunsen coefficients were calculat	
MULCH COGETTOTOMED WELE CATCUIAL	ed by the compiler.
AUXILIARY	INFORMATION
AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS;
AUXILIARY	INFORMATION
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure.
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson,
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson,
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed,</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed,</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed,</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed,</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed, dried over Na. ESTIMATED ERROR:</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed, dried over Na. ESTIMATED ERROR:</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H₂SO₄, washed, dried over Na. ESTIMATED ERROR:</pre>
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached to a buret.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES:
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached to a buret. For an evaluation of the krypton +	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G.
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached to a buret.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES:
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached to a buret. For an evaluation of the krypton +	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G. J. Appl. Chem. 1952, 2, 161. 2. Morrison, T.J.; Billett, F.
AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for constant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8 mm x 180 cm glass spiral attached to a buret. For an evaluation of the krypton +	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Decane. Humphrey-Wilkinson, Inc. Shaken with H_2SO_4 , washed, dried over Na. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G. <u>J. Appl. Chem.</u> 1952, <u>2</u> , 161.

COMPONENTS:	ODTOTIVAT VDAGE	
 Krypton; Kr; 7439-90-9 	ORIGINAL MEASU Makranczy,	REMENTS: J.; Megyery-Balog, K.;
		.; Patyi, L.
2. Decane; C ₁₀ H ₂₂ ; 124-18-5		
	Hung. J. In	<u>d</u> . <u>Chem</u> . 1976, <u>4</u> , 269-280.
VARIABLES: T/K: 298.15	PREPARED BY:	
P/kPa: 101.325 (1 atm)	s	.A. Johnson
EXPERIMENTAL VALUES:		
T/K Mol Fraction		Ostwald
$x_1 \times 10^3$	Coefficient a	Coefficient L
298.15 7.05	0.812	0.886
AUXILIA	RY INFORMATION	
AUXILIA METHOD /APPARATUS/PROCEDURE:	SOURCE AND PU	RITY OF MATERIALS:
	SOURCE AND PU Both the ga cal grade r	RITY OF MATERIALS: as and liquid were analyti- reagents of Hungarian or gin. No further infor-

COMPONENTS :	ORIGINAL MEASUREMENTS:
<pre>1. Krypton; Kr; 7439-90-9 2. Decane; C₁₀H₂₂; 124-18-5</pre>	Wilcock, R. J.; Battino, R.; Danforth, W. F.
	<u>J. Chem</u> . <u>Thermodyn</u> . 1978, <u>10</u> , 817 - 822.
VARIABLES:	PREPARED BY:
T/K: 298.16 P/kPa: 101.325 (1 atm)	A. L. Cramer
EXPERIMENTAL VALUES:	
	Bunsen Ostwald Coefficient Coefficient
$\frac{x_1 \times 10^3}{2}$	α <u>L</u>
298.16 7.361	0.8467 0.9242
A preliminary account of this work app (C.R.) 4th 1975, <u>6</u> , 122-128. The solubility value was adjusted to a	
(1 atm) of krypton by Henry's law.	
The Bunsen coefficient was calculated	by the compiler.
See the evaluation of krypton + decane equation and smoothed solubility value	for the recommended Gibbs energy s.
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solubility apparatus is based on the design of Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus is that de-	 Krypton. The Matheson Co., Inc., or Air Products and Chemicals. Purest commercially available. Decane. Phillips Petroleum Co.
scribed by Battino, Banzhof, Bogan, and Wilhelm (3). See Krypton + n-Octane data sheet for more detail.	99 mol per cent minimum.
	ESTIMATED ERROR:
	$\delta T/K = 0.03 \delta P/mmHg = 0.5 \delta X_1/X_1 = 0.005$
	REFERENCES: 1.Morrison,T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2.Battino,R.;Evans,F.D.;Danforth,W.F. J.Am.Oil Chem.Soc. 1968, 45, 830. 3.Battino, R.; Banzhof, M.; Bogan, M.; Wilhelm, E. Anal. Chem. 1971, 43, 806.

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COMPONENTS:	Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Makranczy, J.; Megyery-Balog, K.;
		Rusz, L.; Patyi, L.
2. Undecane;	; C ₁₁ H ₂₄ ; 1120-21-4	
		Hung. J. Ind. Chem. 1976, 4, 269-280
VARIABLES:		PREPARED BY:
т/К:	298.15 101.325 (1 atm)	S.A. Johnson
P/KPa:	101.325 (I atm)	
EXPERIMENTAL VAL	UES:	L
Т/К	Mol Fraction Bunsen C	Coefficient Ostwald Coefficient
	×1 × 10 ³	α L
		756 0.825
298.15	7.10 0.	756 0.825
The mole fra	ction and Bunsen coeffici	ent were calculated by the compiler.
	AUXILIARY	INFORMATION
	AUXILIARY	INFORMATION
ME THOD:	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:
		SOURCE AND PURITY OF MATERIALS:
Volumetric m	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or
Volumetric m		SOURCE AND PURITY OF MATERIALS:
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, 1	ethod. The apparatus of	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa- tion.
Volumetric m Bodor, Bor, 1	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa-
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa- tion.
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti cal grade reagents of Hungarian or foreign origin. No further informa- tion.
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES:
Volumetric m Bodor, Bor, I used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.;
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G.
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl.
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl. 1957, 1, 55.
Volumetric m Bodor, Bor, i used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl.
Volumetric m Bodor, Bor, I used.	ethod. The apparatus of Mohai, and Sipos (1) was	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl. 1957, 1, 55.

[
	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.: Battino, R.; Saylor, J.H.; Gross, P.M.
2. Dodecane; C ₁₂ H ₂₆ ; 112-40-3	
	J. Phys. Chem. 1957, 61, 1082-1083.
VARIABLES:	PREPARED BY:
T/K: 289.25 - 313.65 P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
$\frac{T/K Mol \ Fraction}{x_1 \times 10^3} C$	Bunsen Ostwald coefficient Coefficient α L
289.25 7.92	0.788 0.834
298.35 7.65 313.65 6.91	0.754 0.824 0.672 0.772
	0.072 0.772
Smoothed data: $\Delta G^{O} = -RT \ln x_{1} = -432$	8.10 + 55.125 T
Std. Dev. $\Delta G^{\circ} = 26.6$,	
	$\Delta S^{\circ}/J K^{-1} mol^{-1} = -55.125$
T/K Mole F	$\frac{1}{10^3}$
	04 11,556
	79 11,832 57 12,107
303.15 7.	35 12,383
	96 12,934 78 13,210
Steinberg and Manowitz, and Makranczy report a krypton in dodecane solubili pages). The tentative recommendation	ty value at 298.15 K (see next two
The Bunsen coefficients were calculat were corrected to a krypton partial p	ed by the compiler. Solubility values pressure of 101.325 kPa by Henry's law.
AUXILIARY	INFORMATION
METHOD: Volumetric. The solvent is satu-	SOURCE AND PURITY OF MATERIALS; 1. Krypton. Linde Air Products Co.
rated with gas as it flows through an 8 mm x 180 cm glass helix attached to	2. Dodecane. Humphrey-Wilkinson,
a gas buret. The total pressure of solute gas plus solvent vapor is	Inc. Shaken with conc. H ₂ SO ₄ ,
maintained at 1 atm as the gas is	water washed, dried over Na.
absorbed.	
ļ	
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	$\delta T/K = 0.05$
The apparatus is a modification of	$\delta P/mmHg = 3$ $\delta x / x = 0.03$
the apparatus of Morrison and Billett (1). The modifications include the	$\delta x_1 / x_1 = 0.03$
addition of a helical storage for the	REFERENCES:
solvent, a manometer for a reference pressure, and an extra buret for	1. Morrison, T.J.; Billett, F.
highly soluble gases. The solvent is	J. <u>Chem. Soc</u> . 1948, 2033; ibid. 1952, 3819.
degassed by a modification of the method of Baldwin and Daniel (2).	
	2. Baldwin, R.R.; Daniel, S.G. J. <u>Appl</u> . <u>Chem</u> . 1952, <u>2</u> , 161.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Steinberg, M.; Manowitz, B.
2. Dodecane; C ₁₂ H ₂₆ ; 112-40-3	
12 26	
	<u>Ind</u> . <u>Eng</u> . <u>Chem</u> . 1959, <u>51</u> , 47-51.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	H.L. Clever
	A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Absorption Coefficient Coefficient
$x_1 \times 10^3$	
298.15 7.8	0.78 0.82
	0
The authors define the Absorption coe:	fficient as the volume of gas, cor-
rected to 288.15 K and 101.325 kPa, al	
of 101.325 kPa per unit volume of solv	vent at 288.15 K.
The mole fraction solubilities and Bun by the compiler.	nsen coefficients were calculated
~	
For an evaluation note on the krypton	+ dodecane system see page 44.
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Absorption coefficient determined by a modified McDaniel method (1).	 Krypton. Technical grade. The Matheson Co.
	2. Dodecane. Technically or
	chemically pure.
	ESTIMATED ERROR:
	ESTIMATED ERROR.
	$\delta\beta/\beta = 0.05 - 0.10$
	REFERENCES:
	1. Furman, N.H. "Scott's Standard
	Methods of Chemical Analysis" Van Nostrand Co., NY, 1939,
	5th ed., Vol. II, p. 2587.
	·····
1	1

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Makranczy, J.; Megyery-Balog, K.;
	Rusz, L.; Patyi, L.
2. Dodecane; C ₁₂ H ₂₆ ; 112-40-3	
	Hung. J. Ind. Chem. 1976, 4, 269-280.
	<u>nung. 5. ind. Chem</u> . 1970, 4, 209-200.
VARIABLES:	PREPARED BY:
Т/К: 298.15	S.A. Johnson
P/kPa: 101.325 (1 atm)	
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$ C	
298.15 7.01	0.693 0.756
	
The mole fraction and Bunsen coefficie	ent were calculated by the compiler.
For an evaluation note on the krypton	+ dodecane system see page 44.
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
4	
Volumetric method. The apparatus	Both the gas and liquid were
of Bodor, Bor, Mohai, and Sipos (1)	analytical grade reagents of
was used.	Hungarian or foreign origin.
	No further information.
1	
	1
	ESTIMATED ERROR:
	$\delta x_1 / x_1 = 0.03$
	1,1
	REFERENCES:
	1. Bodor, E.; Bor, Gy.; Mohai, B.;
	Sipos, G.
	Veszpremi Vegyip. Egy. Kozl.
	1957, 1, 55.
	<u>Chem</u> . <u>Abstr</u> . 1961, <u>55</u> , 3175h.
1	

COMPONENTS: 1. Krypton;	Kr; 7439-90-9	ORIGINAL MEAS	SUREMENTS: , J.; Megyery-Balog, K.;
		Rusz, 1	L.; Patyi, L.
2. Tridecane	; C ₁₃ H ₂₈ ; 629-50-5		
		Hung. J.	Ind. Chem. 1976, <u>4</u> , 269-280.
WADTADI DO .			
	298.15	PREPARED BY:	
P/kPa:	101.325 (1 atm)	S	.A. Johnson
EVER DIACING AL MAL			
EXPERIMENTAL VAL			
T/K	Mol Fraction Bunsen	Coefficient	Ostwald Coefficient
	$x_{1} \times 10^{3}$	α	L
298.15	6.96 0	.641	0.700
The mole frac	tion and Bunsen coeffic	ient were ca	lculated by the compiler.
		/ INFORMATION	
	AUXILIAR	INFORMATION	
METHOD:	AUXILIAR	SOURCE AND PI	URITY OF MATERIALS:
Volumetric me	thod. The apparatus of	SOURCE AND P Both the	gas and liquid were analyti-
Volumetric me Bodor, Bor, M		SOURCE AND P Both the cal grade	gas and liquid were analyti- reagents of Hungarian or
Volumetric me	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti-
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the cal grade	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or
Volumetric me Bodor, Bor, M	thod. The apparatus of	SOURCE AND PU Both the of cal grade foreign of tion.	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa-
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND P Both the o cal grade foreign on	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa-
Volumetric me Bodor, Bor, M	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the o cal grade foreign on tion.	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR:
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the o cal grade foreign on tion.	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa-
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the o cal grade foreign on tion.	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR:
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the o cal grade foreign on tion.	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR:
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PU Both the of cal grade foreign on tion. ESTIMATED ER REFERENCES:	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: δx ₁ /x ₁ = 0.03
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PU Both the of cal grade foreign of tion. ESTIMATED ER REFERENCES: 1. Bodor	gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: $\delta x_1/x_1 = 0.03$, E.; Bor, Gy.; Mohai, B.;
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the of cal grade foreign of tion. ESTIMATED ER REFERENCES: 1. Bodor Sig	<pre>gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: δX1/X1 = 0.03 , E.; Bor, Gy.; Mohai, B.; pos, G.</pre>
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the of cal grade foreign on tion. ESTIMATED ER REFERENCES: 1. Bodor Sin Veszpi	<pre>gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: δX1/X1 = 0.03 , E.; Bor, Gy.; Mohai, B.; pos, G. remi Vegyip. Egy. Kozl.</pre>
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the of cal grade foreign on tion. ESTIMATED ER REFERENCES: 1. Bodor Sin Veszpi 1957,	<pre>gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: δX₁/X₁ = 0.03 , E.; Bor, Gy.; Mohai, B.; pos, G. <u>remi Vegyip. Egy. Kozl</u>. 1, 55.</pre>
Volumetric me Bodor, Bor, M used.	ethod. The apparatus of Nohai, and Sipos (1) was	SOURCE AND PA Both the of cal grade foreign on tion. ESTIMATED ER REFERENCES: 1. Bodor Sin Veszpi 1957,	<pre>gas and liquid were analyti- reagents of Hungarian or rigin. No further informa- ROR: δX1/X1 = 0.03 , E.; Bor, Gy.; Mohai, B.; pos, G. remi Vegyip. Egy. Kozl.</pre>

	1
COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Clever, H.L.; Battino, R.;
1. Krypton, Kr, 7439-90-9	Saylor, J.H.; Gross, P.M.
2. Tetradecane; C ₁₄ H ₃₀ ; 629-59-4	-
	J. Phys. Chem. 1957, 61, 1078-1083
VARIABLES:	PREPARED BY:
T/K: 289.15 - 313.45	
Total P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
	oefficient Ostwald Coefficient
$x_1 \times 10^3$	α L
289.15 8.34 0.	747 0.791
298.15 7.81 0.	693 0.756
313.45 7.03 0.	614 0.705
Smoothed Data: $\Delta G^{O}/J \mod^{-1} = -RT \ln$	$X_1 = -5304.3 + 58.139 \text{ T}$
Std. Dev. $\Delta G^{\circ} = 1.2$, C	1
$\Delta H^{O}/J \text{ mol}^{-1} = -5304.3$	$\Delta s^{\circ}/J \ \kappa^{-1} \ mol^{-1} = -58.139$
T/K Mol Fracti	on $\Delta G^{O}/J \text{ mol}^{-1}$
$x_1 \times 10^3$	
288.15 8.41	11449
293.15 8.10 298.15 7.81	11739 12030
303.15 7.53	12321
308.15 7.28	12611
313.15 7.05	12902 13193
318.15 6.82	
The solubility values were adjusted to	a partial pressure of 101.325 kPa
(1 atm) by Henry's law.	
The Bunsen Coefficients were calculate	d by the compiler.
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The solvent is satu-	1. Krypton. Linde Air Products Co.
rated with gas as it flows through an	Pure grade.
8 mm x 180 cm glass spiral attached	2. Tetradecane. Humphrey-Wilkinson,
to a gas buret. The total pressure of solute gas plus solvent vapor is main-	
tained at 1 atm as the gas is	dried over Na.
absorbed.	difed over na.
ADDED NOTE: Makranczy, J.; Megyery-	
Balog, K.; Rusz,L.; Patyi,L. <u>Hung</u> . J. Ind. Chem. 1976, 4, 269 report an	
Ostwald coefficient of 0.657 at 298.15	
K for this system. The value was not	
used in the smoothed data fit above.	ESTIMATED ERROR: $\delta T/K = 0.05$
The apparatus is a modification of	$\delta P/mmHq = 3$
that of Morrison and Billett (1). The modifications include the addition of	$\delta x_1 / x_1 = 0.03$
a spiral storage for the solvent, a	
manometer for a constant reference	REFERENCES:
pressure, and an extra buret for highly soluble gases. The solvent is	1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033;
degassed by a modification of the	<u>ibid. 1952, 3819.</u>
method of Baldwin and Daniel (2).	
	 Baldwin, R.R.; Daniel, S.G. J. Appl. Chem. 1952, 2, 161.
	<u></u>

СОМРО	NENTS :		ORIGINAL MEASUR	EMENTS •
1.		Kr; 7439-90-9	Makranczy,	J.; Megyery-Balog, K.;
2.		ane; C ₁₅ H ₃₂ ; 629-62-9	Rusz, L.;	; Patyi, L.
	or Hexadecar	ne; C ₁₆ H ₃₄ ; 544-76-3	Hung, J. Ind	<u>1. Chem</u> . 1976, <u>4</u> , 269-280.
		,,,,,,,		<u>a. enem</u> . 1970, <u>4</u> , 209 200
VARIA		298.15	PREPARED BY:	
	P/kPa:	101.325 (1 atm)	S.A.	Johnson
EXPER	RIMENTAL VAL	UES:		
	T/K	Mol Fraction Bunser	Coefficient	Ostwald Coefficient
		× 10 ³	α	L
		Pentadecane; (² 15 ^H 32; ⁶²⁹⁻⁶²⁻⁹	9
	298.15	7.04	0.573	0.625
		Hexadecane; (C16 ^H 34; 544-76-3	3
	298.15	6.96	0.534	0.583
The	e mole frac	ction and Bunsen coeffic	cient were calcu	ulated by the compiler.
The	e mole frac	ction and Bunsen coeffic	cient were calc	ulated by the compiler.
The	e mole frac		cient were calcu	ulated by the compiler.
The			Y INFORMATION	ulated by the compiler.
METH	OD: .umetric mo		Y INFORMATION SOURCE AND PURI E Both the ga s cal grade r	TY OF MATERIALS: s and liquid were analyti eagents of Hungarian or
METH Vol Bod	OD: .umetric mo	AUXILIAN ethod. The apparatus o	Y INFORMATION SOURCE AND PURI Both the ga cal grade r foreign origination.	TY OF MATERIALS: s and liquid were analyti eagents of Hungarian or gin. No further informa-
METH Vol Bod use	OD: .umetric mo	AUXILIAN ethod. The apparatus o Mohai, and Sipos (1) wa	Y INFORMATION SOURCE AND PURI Both the ga cal grade re foreign origination.	TY OF MATERIALS: s and liquid were analyti eagents of Hungarian or gin. No further informa-

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IENTS:		ORIGINAL MEASUREMENTS:
		Orobinsky, N. A., Blagoy, Yu. P. and Semyannikova, E. L., Ukr. Fiz. Zhur., <u>1968</u> , 13, 372.
BLES: erature, p	ressure	PREPARED BY: C. L. Young
IMENTAL VALU	ES:	
P/bar	Mole fraction of kry in liquid, ^x Kr	pton Mole fraction of krypton T/K P/bar in liquid, ^x Kr
1.10 1.30 1.47 1.64 1.81	0.291 0.417 0.530 0.663 0.784	150 4.95 0.669 5.34 0.763 5.83 0.854 5.98 0.873 6.28 0.958
1.91 1.96 1.11 1.32 1.89 2.37 2.55 2.82	0.865 0.925 0.121 0.177 0.355 0.426 0.506 0.569	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
3.06 3.29 3.33 3.51 3.73 1.91 2.89 3.46 3.66 4.10 4.63	0.679 0.785 0.785 0.887 0.948 0.172 0.310 0.378 0.425 0.515 0.605	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
4.83		14.22 0.904
rculating ed with ma measured stance the ured with les of lig	vapor flow apparatus gnetic pump. Temper with platinum rmometer; pressure Bourdon gauge. uid phase analysed by	0.02 mole per cent nitrogen, oxygen and carbon dioxide and less than 0.5 mole per cent
		ESTIMATED ERROR: $\delta T/K = \pm 0.03; \delta P/bar = \pm 0.48;$ $\delta x_{Kr} = \pm 0.58.$ REFERENCES:
	<pre>Krypton; Propene; BLES: erature, p MENTAL VALU P/bar 1.10 1.30 1.47 1.64 1.81 1.91 1.96 1.11 1.32 1.89 2.37 2.55 2.82 3.06 3.29 3.33 3.51 3.73 1.91 2.89 3.46 3.66 4.10 4.63 4.83 D/APPARATU culating ed with ma measured stance the ared with Les of lig</pre>	Krypton; Kr; $7439-90-9$ Propene; C_3H_6 ; $74-98-6$ SLES: Prature, pressure EMENTAL VALUES: Mole fraction of kryp P/bar in liquid, x_{Kr} x_{Kr} 1.10 0.291 1.30 0.417 1.47 0.530 1.64 0.663 1.81 0.784 1.91 0.865 1.96 0.925 1.11 0.121 1.32 0.177 1.89 0.355 2.37 0.426 2.55 0.506 2.82 0.569 3.06 0.679 3.29 0.785 3.33 0.785 3.51 0.887 3.73 0.948 1.91 0.172 2.89 0.310 3.46 0.378 3.66 0.425 4.10 0.515 4.63 0.605 4.83 0.667

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Krypton; Kr; 7439-90-9	Orobinsky, N. A., Blagoy, Yu. P. and Semyarnikova, E. L., Ukr. Fiz.
(2) Propene; C ₃ H ₆ ; 74-98-6	Zhur., <u>1968</u> , 13, 372.

EXPERIMENTAL VALUES:

P/bar	Mole fraction of krypton in liquid, ^x Kr	Т/К	<i>P/</i> bar	Mole fraction of krypton in liquid, ^x Kr
2.78	0.086	190	11.13	0.307
3.66	-			0.403
6.62	0.234			0.477
9.12	0.355		17.3	0.510
10.84	0.404		21.5	0.656
12.61	0.495		22.8	0.724
14.42	0.579		23.5	0.760
14.57	0.590	200	4.90	0.097
17.46	0.744		7.97	0.160
17.7	0.769		12.32	0.255
18.3	0.799		16.5	0.333
19.3	0.865		17.8	0.351
2.78	0.063		23.3	0.503
7.33	0.189		29.4	0.693
	2.78 3.66 6.62 9.12 10.84 12.61 14.42 14.57 17.46 17.7 18.3 19.3 2.78	P/bar in liquid, xKr 2.78 0.086 3.66 0.110 6.62 0.234 9.12 0.355 10.84 0.404 12.61 0.495 14.42 0.579 14.57 0.590 17.46 0.744 17.7 0.769 18.3 0.799 19.3 0.865 2.78 0.063	P/bar in liquid, T/K xKr xKr 2.78 0.086 190 3.66 0.110 190 3.66 0.234 9.12 0.355 10.84 0.404 12.61 0.495 14.42 0.579 14.57 0.590 200 17.46 0.744 17.7 0.769 18.3 0.799 19.3 0.865 2.78 0.063 0.063 0.063	P/bar in liquid, T/K P/bar x_{Kr} 2.780.08619011.133.660.11014.426.620.23416.59.120.35517.310.840.40421.512.610.49522.814.420.57923.514.570.5902004.9017.460.7447.770.76912.3218.30.79916.519.30.86517.82.780.06323.3

COMPONENTS:		EVALUATOR:
1. Krypton; Kr; 743	9-90-9	H.L. Clever
		Chemistry Department
2. Cyclohexane; C ₆ H	12; 110-82-7	Emory University
Ũ		Atlanta, GA 30322
		U.S.A.
	181	
laboratories. Cleve between 289.15 and 3 and 309.35 K. Each temperature by the m within 1.7 per cent	r, Battino, Sayl 13.65 K. Dymond data set was fit withod of least s at 293.15 K and lues being the h	<pre>xane at 101.325 kPa was measured in two or and Gross (1) report three values (2) reports four values between 293.50 ted to a Gibbs energy equation linear in quares. The smoothed data agreed 0.5 per cent at 313.15 K, with the igher values over the temperature range. experimental error.</pre>
The seven solubility fitted to a Gibbs en least squares to obt	ergy equation li	two laboratories were combined and near in temperature by the method of ded equation.
gas at 101.325 kPa (are	1 atm) to the hy	for the transfer of krypton from the pothetical unit mole fraction solution
∆G ^O ∕J mol	$^{-1}$ = -RT ln X ₁ =	-3,576.0 + 56.557 T
Std. Dev.	$\Delta G^{O} = 15$, Coef.	Corr. = 0.9995
∆H ^O /J mol	$^{-1} = -3,576.0, \Delta$	$S^{O}/J K^{-1} mol^{-1} = -56.557$
Table 1.	solution as a lu	nction of temperature are given in
TABLE 1.	Recommended mol Gibbs energy of of temperature.	rypton in cyclohexane. e fraction solubility and solution as a function
TABLE 1.	Recommended mol Gibbs energy of of temperature.	e fraction solubility and solution as a function
TABLE 1.	Recommended mol Gibbs energy of of temperature. T/K Mol Fr	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$
TABLE 1.	Recommended mol Gibbs energy of of temperature. T/K Mol Fr	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$ 10^{3} 4 12,721 2 13,004
TABLE 1.	Recommended mol Gibbs energy of of temperature. $T/K Mol Fr$ $\frac{X_1 \times X_2}{288.15}$ $\frac{X_1 \times X_2}{4.9}$ $\frac{293.15}{298.15}$	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$ 10 ³ 4 12,721 2 13,004 0 13,286
TABLE 1.	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5	e fraction solubility and solution as a function action $\Delta G^{O}/J \mod^{-1}$ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,569
TABLE 1.	Recommended mol Gibbs energy of of temperature. $T/K Mol Fr$ $\frac{X_1 \times X_2}{288.15}$ $\frac{X_1 \times X_2}{4.9}$ $\frac{293.15}{298.15}$	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,569 9 13,852
TABLE 1.	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,569 9 13,852 9 14,135
	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo	e fraction solubility and solution as a function action $\Delta G^{O}/J \text{ mol}^{-1}$ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,569 9 13,852 9 14,135
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
1. Clever, H.L.; Ba	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.
 Clever, H.L.; Ba J. <u>Phys</u>. <u>Chem</u>. 1 	Recommended mol Gibbs energy of of temperature. T/K Mol Fr 288.15 4.9 293.15 4.8 298.15 4.7 303.15 4.5 308.15 4.4 313.15 4.3 318.15 4.2 ttino, R.; Saylo 957, <u>61</u> , 1078.	e fraction solubility and solution as a function action ΔG ^O /J mol ⁻¹ 10 ³ 4 12,721 2 13,004 0 13,286 9 13,852 9 14,135 9 14,418 r, J.H.; Gross, P.M.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.; Battino, R.;
	Saylor, J.H.; Gross, P.M.
2. Cyclohexane; C ₆ H ₁₂ ; 110-82-7	
	<u>J. Phys. Chem</u> . 1957, <u>61</u> , 1078-1083.
VARIABLES: T/K: 289.15 - 313.65	PREPARED BY:
P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$	α L
289.15 4.98	1.021 1.081
298.15 4.67	0.967 1.055
313.65 4.36	0.885 1.016
Smoothed Data: $\Delta G^{O} = -RT \ln x_{1} = -340$	55.1 + 56.239 T
Std. Dev. $\Delta G^{O} = 0.6$, (
atu. Dev. 46 - 0.6, 0	
For an evaluation of the krypton + c	vclohexane system see page 53 with
a recommendation of a Gibbs energy e	Juation and solubility values.
The solubility values were adjusted (101.325 kPa (1 atm) by Henry's law. by the compiler.	The Bunsen coefficients were calculate
101.325 kPa (1 atm) by Henry's law.	The Bunsen coefficients were calculate
101.325 kPa (1 atm) by Henry's law. ' by the compiler.	The Bunsen coefficients were calculated
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY	The Bunsen coefficients were calculated
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE:	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS:
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi-	The Bunsen coefficients were calculate
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure.
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2),	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure.
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum
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101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculated INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum
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101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR:</pre>
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR:</pre>
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR:</pre>
101.325 kPa (1 atm) by Henry's law. ' by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G.
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculated INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta x_1/x_1 = 0.03$ REFERENCES:
101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculated INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G.
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101.325 kPa (1 atm) by Henry's law. by the compiler. AUXILIARY METHOD /APPARATUS/PROCEDURE: Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was that of Morrison and Billett (2), modified to include spiral storage for the solvent, a manometer for con- stant reference pressure, and an extra buret. Solvent was saturated with gas as it flowed through an 8mm x 180 cm glass spiral attached to a	The Bunsen coefficients were calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. Pure. 2. Cyclohexane. Phillips Petroleum Co. Used as received. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta x_1/x_1 = 0.03$ REFERENCES: 1. Baldwin, R.R.; Daniel, S.G. <u>J. Appl. Chem</u> . 1952, <u>2</u> , 161. 2. Morrison, T.J.; Billett, F.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Dymond, J. H.
2. Cyclohexane; C ₆ H ₁₂ ; 110-82-7	
	<u>J. Phys. Chem</u> . 1967, <u>71</u> , 1829 - 1831.
VARIABLES:	PREPARED BY:
T/K: 293.50 - 309.35 P/kPa: 101.325 (1 atm)	M. E. Derrick
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
$x_1 \times 10^3$	Coefficient Coefficient α L
293.50 4.85	1.01 1.08
298.15 4.73 304.75 4.57	0.979 1.07 0.939 1.05
309.35 4.47	0.909 1.03
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = - RT \ln$	Х ₁ =-3893.4 + 57.572 т
Std. Dev. $\Delta G^\circ = 0.8$,	Coef. Corr. = 0.9999
AUXILIARY	INFORMATION
AUXILIARY METHOD:	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: Saturation of liquid with gas at par-	
METHOD:	SOURCE AND PURITY OF MATERIALS:
METHOD: Saturation of liquid with gas at par- tial pressure of gas equal to 1 atm.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., dried. 2. Cyclohexane. Matheson, Coleman, and Bell, chromatoquality reagent. Dried and fractionally frozen.
METHOD: Saturation of liquid with gas at par- tial pressure of gas equal to 1 atm. APPARATUS/PROCEDURE: Dymond-Hildebrand apparatus (1) using	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., dried. 2. Cyclohexane. Matheson, Coleman, and Bell, chromatoquality reagent. Dried and fractionally frozen. m.p. 6.45° C.
METHOD: Saturation of liquid with gas at par- tial pressure of gas equal to 1 atm. APPARATUS/PROCEDURE: Dymond-Hildebrand apparatus (1) using an all-glass pumping system to spray slugs of degassed solvent into the	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., dried. 2. Cyclohexane. Matheson, Coleman, and Bell, chromatoquality reagent. Dried and fractionally frozen. m.p. 6.45° C. ESTIMATED ERROR:
METHOD: Saturation of liquid with gas at par- tial pressure of gas equal to 1 atm. APPARATUS/PROCEDURE: Dymond-Hildebrand apparatus (1) using an all-glass pumping system to spray	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., dried. 2. Cyclohexane. Matheson, Coleman, and Bell, chromatoquality reagent. Dried and fractionally frozen. m.p. 6.45° C. ESTIMATED ERROR:</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.; Saylor, J.H.;
<pre>2. Methylcyclohexane; C7^H14; 108-87-2</pre>	Gross, P.M.
	J. Phys. Chem. 1958, 62, 89-91.
VARIABLES:	PREPARED BY:
T/K: 289.15 - 316.25 Total P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^3$	α L
289.15 6.14 303.15 5.56 316.25 5.02	1.086 1.15 0.971 1.078 0.863 0.999
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	
Std. Dev. $\Delta G^{\circ} = 13.5$,	Coef. Corr. = 0.9999
$\Delta H^{O}/J \text{ mol}^{-1} = -5652.1$, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -61.865$
	action $\Delta G^{O}/J \text{ mol}^{-1}$
X ₁ ×	10 ³
288.15 6.1	21 12,174
293.15 5. 298.15 5.	74 12,793
303.15 5.	
308.15 5. 313.15 5. 318.15 4	14 13,721
318.15 4.	97 14,030
The solubility values were adjusted to 101.325 kPa (1 atm) by Henry's law.	o a partial pressure of krypton of
The Bunsen coefficients were calculate	ed by the compiler.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The apparatus (1) is	1. Krypton. Matheson Co., Inc.
a modification of that used by Morrison and Billett (2). Modifica-	Both standard and research grades were used.
tions include the addition of a spiral solvent storage tubing, a	
manometer for constant reference pres-	2. Methylcyclohexane. Eastman Kodak Co., white label. Dried
sure, and an extra gas buret for	over Na and distilled; corrected b.p. 100.95 to 100.97°, lit.
highly soluble gases.	b.p. 100.93 66 100.970, 111.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	$\delta T/K = 0.05$
(a) Degassing. 700 ml of solvent is shaken and evacuated while	$\delta P/mmHg = 3$
attached to a cold trap, until no	$\delta x_1 / x_1 = 0.03$
bubbles are seen; solvent is then transferred through a 1 mm capillary	REFERENCES :
tubing, released as a fine mist into	1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
a continuously evacuated flask. (b) Solvent is saturated with gas as it	J. Phys. Chem. 1957, 61, 1078.
flows through 8 mm x 180 cm of tubing	
attached to a gas buret. Pressure is maintained at 1 atm as the gas is	J. Chem. Soc. 1948, 2033;
absorbed.	<u>ibid</u> . 1952, 3819.

covponyna .	007.073	
COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Krypton; Kr; 7439-90-9	Wilcock, R.J.; Battino, R.; Wilhelm, E.	
2. Cyclooctane; C ₈ H ₁₆ ; 292-64-8		
	<u>J. Chem</u> . <u>Thermodyn</u> . 1977, <u>9</u> , 111-115.	
VARIABLES:	PREPARED BY:	
T/K: 298.26		
P/kPa: 101.325	H.L. Clever	
EXPERIMENTAL VALUES:	I	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient	
$x_{1} \times 10^{3}$	a L	
298.26 3.442	0.5727 0.6254	
The solubility values were adjusted to	a partial pressure of krypton of	
101.325 kPa (1 atm) by Henry's law. T calculated by the compiler.	The Bunsen coefficients were	
carculated by the compiler.		
	•	
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
The apparatus is based on the de- sign by Morrison and Billett (1) and	 Krypton. Matheson Co., Inc. Minimum purity 99.995 mol per 	
the version used is described by	cent.	
Battino, Evans, and Danforth (2). Degassing. Up to 500 cm ³ of sol-	2. Cyclooctane. Chemical Samples	
vent is placed in a flask of such size		
that the liquid is about 4 cm deep. The liquid is rapidly stirred and	distilled, n(Na D, 298.15 K) = 1.4562.	
vacuum is applied intermittently	1.4502.	
through a liquid N ₂ trap until the permanent gas residual pressure drops		
to 5 microns.		
Solubility Determination. The de- gassed solvent passes in a thin film	ESTIMATED ERROR:	
down a glass spiral containing the	$\delta T/K = 0.03$ $\delta P/mmHg = 0.5$	
solute gas and solvent vapor at a total pressure of one atm. The volume	$\delta x / x = 0.03$	
of gas absorbed is measured in the		
attached gas buret, and the solvent is collected in a tared flask and	REFERENCES: 1. Morrison, T.J.; Billett, F.	
weighed.	<u>J. Chem. Soc</u> . 1948, 2033.	
	2. Battino, R.; Evans, F.D.;	
	Danforth, W.F.	
	<u>J. Am.Oil Chem. Soc</u> . 1968, <u>45</u> , <u>8</u> 30.	

COMPONENTS: 1. Krypton; Kr	; 7439-90-9	ORIGINAL MEASUREMENTS: Geller, E.B.; Battino, R.;
		Wilhelm, E.
2. <u>cis</u> -1,2-Dim C ₈ H ₁₆ ; 2207	methylcyclohexane; 7-01-4	
		J. <u>Chem</u> . <u>Thermodyn</u> . 1976, <u>8</u> , 197-202.
VARIABLES:	<u></u>	PREPARED BY:
	297.92	H.L. Clever
P/kPa:	101.325 (1 atm)	
EXPERIMENTAL VALU	ES:	
	T/K Mol Fraction	Bunsen Ostwald
		Coefficient Coefficient
		α L
	297.92 5.447	0.8684 0.9472
The solubility 101.325 kPa (1	y values were adjusted to atm) by Henry's law.	o a partial pressure of krypton of
The Bunsen coe	efficients were calculate	ed by the compiler.
		• •
	AUXILIARY	INFORMATION
METHOD/APPARATU		INFORMATION SOURCE AND PURITY OF MATERIALS:
The apparatu	JS/PROCEDURE: 1s is based on the de-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products &
The apparatu sign by Morris	JS/PROCEDURE: Is is based on the de- Son and Billett (1) and	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co.,
The apparatu sign by Morris the version us Battino, Evans	US/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2).	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better.
The apparatu sign by Morris the version us Battino, Evans Degassing.	US/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. <u>cis</u>-1,2-Dimethylcyclohexane.
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed	US/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction-
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size d is about 4 cm deep. rapidly stirred, and	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction-
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size d is about 4 cm deep. rapidly stirred, and lied intermittently	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size d is about 4 cm deep. rapidly stirred, and	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n_D(298.15 K) 1.4337.</pre>
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns.	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by a, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently hid N ₂ trap until the residual pressure drops	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n_D(298.15 K) 1.4337.</pre>
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by a, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and hed intermittently did N ₂ trap until the residual pressure drops Determination. The de-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n_D(298.15 K) 1.4337.</pre>
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and hed intermittently hid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n_D(298.15 K) 1.4337. ESTIMATED ERROR:</pre>
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so	JS/PROCEDURE: as is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size a sabout 4 cm deep. rapidly stirred, and hed intermittently hid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- plute gas plus the	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n_D(298.15 K) 1.4337. ESTIMATED ERROR:</pre>
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and hed intermittently hid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- blute gas plus the at a total pressure of	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. <u>cis-1,2-Dimethylcyclohexane</u> . Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.2$
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor one atm. The is found by di	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently bid N ₂ trap until the residual pressure drops Determination. The de- ts passed in a thin ass spiral tube con- blute gas plus the at a total pressure of volume of gas absorbed Ifference between the	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta x_1/x_1 = 0.2$ REFERENCES:
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor one atm. The is found by di	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently bid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- blute gas plus the at a total pressure of volume of gas absorbed ifference between the inal gas volume in the	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.2$ REFERENCES: 1. Morrison, T.J.; Billett, F.
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor one atm. The is found by di initial and fi buret system.	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently bid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- blute gas plus the at a total pressure of volume of gas absorbed ifference between the inal gas volume in the	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.2$ REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033.
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor one atm. The is found by di initial and fi buret system.	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently hid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- blute gas plus the at a total pressure of volume of gas absorbed ifference between the thal gas volume in the The solvent is col-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.2$ REFERENCES: 1. Morrison, T.J.; Billett, F.
The apparatu sign by Morris the version us Battino, Evans Degassing. vent is placed that the liqui The liquid is vacuum is appl through a liqu permanent gas to 5 microns. Solubility D gassed solvent film down a gl taining the so solvent vapor one atm. The is found by di initial and fi buret system.	JS/PROCEDURE: Is is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). Up to 500 cm ³ of sol- in a flask of such size id is about 4 cm deep. rapidly stirred, and lied intermittently hid N ₂ trap until the residual pressure drops Determination. The de- t is passed in a thin ass spiral tube con- blute gas plus the at a total pressure of volume of gas absorbed ifference between the thal gas volume in the The solvent is col-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc., 99 mol % or better. 2. cis-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark n _D (298.15 K) 1.4337. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.2$ REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033. 2. Battino, R.; Evans, F.D.;

COMPONENTS :		ORIGINAL MEASUREMENTS:
1. Krypton; K	Kr; 7439-90-9	Geller, E.B.; Battino, R.;
2. $\frac{\text{trans}-1, 2}{C_8H_{16}}$; 687	Dimethylcyclohexane; 6-23-9	Wilhelm, E.
		J. Chem. Thermodyn. 1976, 8, 197-202
VARIABLES:		PREPARED BY:
	297.91 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALU	ES:	
	T/K Mol Fraction	Bunsen Ostwald
	-,	Coefficient Coefficient
	$\qquad \qquad $	α L
	297.91 5.972	0.9270 1.011
The solubility 101.325 kPa (1	v values were adjusted t . atm) by Henry's law.	o a partial pressure of krypton of
The Bunsen cos	efficients were calculat	ed by the compiler.
	AUXILIARY	INFORMATION
METHOD / APPARATU		INFORMATION SOURCE AND PURITY OF MATERIALS:
The apparat sign by Morris the version us Battino, Evans See kryptor		 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals Inc., or Matheson Co., Inc., 99 mol % or better. 2. trans-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction-
The apparat sign by Morris the version us Battino, Evans See kryptor	US/PROCEDURE: tus is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). a + 1,2 dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals Inc., or Matheson Co., Inc., 99 mol % or better. 2. trans-1,2-Dimethylcyclohexane.</pre>
The apparat sign by Morris the version us Battino, Evans See kryptor	US/PROCEDURE: tus is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). a + 1,2 dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals Inc., or Matheson Co., Inc., 99 mol % or better. 2. trans-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in
The apparat sign by Morris the version us Battino, Evans See kryptor	US/PROCEDURE: tus is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). a + 1,2 dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals Inc., or Matheson Co., Inc., 99 mol % or better. 2. trans-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark. n_D(298.15) 1.4248.</pre>
The apparat sign by Morris the version us Battino, Evans See kryptor	US/PROCEDURE: tus is based on the de- son and Billett (1) and sed is described by s, and Danforth (2). a + 1,2 dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals Inc., or Matheson Co., Inc., 99 mol % or better. 2. trans-1,2-Dimethylcyclohexane. Chemical Samples Co., fraction- ally distilled and stored in dark. n_D(298.15) 1.4248. ESTIMATED ERROR:</pre>

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COMPONENTS: 1. Krypton; Kr; 7439	-90-9	ORIGINAL MEASUREMENTS: Geller, E.B.; Battino, R.;
2. <u>cis</u> -1,3-Dimethylc mol %; C ₈ H ₁₆ ; 638	yclohexane, 59	Wilhelm, E.
3. <u>trans</u> -1,3-Dimethy mol %; C _H ; 220 8 16	lcyclohexane,41	J. <u>Chem</u> . <u>Thermodyn</u> . 1976, <u>8</u> , 197-202
VARIABLES:		PREPARED BY:
T/K: 298.21 P/kPa: 101.32	5 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	<u></u>	
T/K	Mol Fraction	Bunsen Ostwald
-,		Coefficient Coefficient
	$\frac{x_1 \times 10^3}{1}$	α L
298.21	5.883	0.9094 0.9928
The solubility values 101.325 kPa (1 atm) k	were adjusted t y Henry's law.	o a partial pressure of krypton of
The Bunsen coefficier	ts were calculat	ed by the compiler.
	AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCE The apparatus is h	DURE: based on the	INFORMATION SOURCE AND PURITY OF MATERIALS; 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co.
The apparatus is h design by Morrison ar and the version used	DURE: pased on the d Billett (1) is described by	SOURCE AND PURITY OF MATERIALS; 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better.
The apparatus is h design by Morrison ar	DURE: ased on the d Billett (1) is described by anforth (2). Dimethylcyclo-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co.
The apparatus is h design by Morrison ar and the version used Battino, Evans, and I See krypton + 1,2-	DURE: ased on the d Billett (1) is described by anforth (2). Dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. <u>cis-1,3-Dimethylcyclohexane.</u> Chemical Samples Co., binary mix ture, analysed by R. I. by auth-
The apparatus is h design by Morrison ar and the version used Battino, Evans, and I See krypton + 1,2-	DURE: ased on the d Billett (1) is described by anforth (2). Dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS; 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. <u>cis</u>-1,3-Dimethylcyclohexane. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received. 3. <u>trans</u>-1,3-Dimethylcyclohexane. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received. ESTIMATED ERROR:
The apparatus is h design by Morrison ar and the version used Battino, Evans, and I See krypton + 1,2-	DURE: ased on the d Billett (1) is described by anforth (2). Dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS; 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. <u>cis-1,3-Dimethylcyclohexane</u>. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received. 3. <u>trans-1,3-Dimethylcyclohexane</u>. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received.
The apparatus is h design by Morrison ar and the version used Battino, Evans, and I See krypton + 1,2-	DURE: ased on the d Billett (1) is described by anforth (2). Dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS; 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. cis-1,3-Dimethylcyclohexane. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received. 3. trans-1,3-Dimethylcyclohexane. Chemical Samples Co., binary mix ture, analysed by R. I. by auth- ors, used as received. ESTIMATED ERROR:</pre>

CONDONENTS	
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Geller, E.B.; Battino, R.; Wilhelm, E.
<pre>2. cis-1,4-Dimethylcyclohexane, 70 mol %; C H ; 624-29-3</pre>	
<pre>3. trans-1,4-Dimethylcyclohexane, 30 mol %; C₈H₁₆; 2207-04-7</pre>	<u>J. Chem</u> . <u>Thermodyn</u> . 1976, <u>8</u> , 197-202.
VARIABLES:	PREPARED BY:
T/K: 298.35 P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
-	Coefficient Coefficient
$x_1 \times 10^3$	α L
298.35 6.005	0.9320 1.018
The solubility value was adjusted to 101.325 kPa (1 atm) by Henry's law.	a partial pressure of krypton of
The Bunsen coefficient was calculate	ed by the compiler.
	•
AUXILIARY	
METHOD/APPARATUS/PROCEDURE:	INFORMATION
	SOURCE AND PURITY OF MATERIALS:
The apparatus is based on the design by Morrison and Billett (1) and the version used is described by	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products &
design by Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co.,
design by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). See krypton + 1,2 dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc. 99 mol % or better. 2. <u>cis-1,4-Dimethylcyclohexane.</u> Chemical Samples Co., binary mix- ture, analysed by R. I. by auth-
design by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). See krypton + 1,2 dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc. 99 mol % or better. 2. cis-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. 3. trans-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth-
design by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). See krypton + 1,2 dimethylcyclo-	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc. 99 mol % or better. 2. <u>cis-1,4-Dimethylcyclohexane</u>. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. 3. <u>trans-1,4-Dimethylcyclohexane</u>. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received.
design by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). See krypton + 1,2 dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc. 99 mol % or better. 2. cis-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. 3. trans-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. ESTIMATED ERROR:</pre>
design by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). See krypton + 1,2 dimethylcyclo-	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co., Inc. 99 mol % or better. 2. cis-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. 3. trans-1,4-Dimethylcyclohexane. Chemical Samples Co., binary mix- ture, analysed by R. I. by auth- ors, used as received. ESTIMATED ERROR:</pre>

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Körösy, F.
	KOLOSY, T.
2. 1,2,3,4-Tetrahydronaphthalene (Tetralin); C ₁₀ H ₁₂ ; 119-64-2	
	Trans. Faraday Soc. 1937, 33, 416-425.
VARIABLES:	PREPARED BY:
т/к: 297.15	
P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	, 1 ,
T/K Mol Fraction	Bunsen Ostwald
3	Coefficient Coefficient
$x_1 \times 10^3$	α L
297.15 2.7	0.45 0.49
The mole fraction solubility and the the compiler. It was assumed that ga coefficient is independent of pressur	Bunsen coefficient were calculated by s behavior is ideal, the Ostwald e, and that Henry's law is obeyed.
AUXILIAR	Y INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
The apparatus and method of Winkle (1) were used. However, the apparatu was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	r l. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases.
APPARATUS/PROCEDURE :	ESTIMATED ERROR: $\delta x_1 / x_1 = 0.05$
	REFERENCES: 1. Winkler, L.W.

I

COMPONENTS: 0RIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 0RIGINAL MEASUREMENTS: 2. Benzene; C_6H_6 ; 71-43-2 Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. J. Phys. Chem. 1957, 61, 1078-1 VARIABLES: J. Phys. Chem. 1957, 61, 1078-1 PKPa: 101.325 (1 atm) PREPARED BY: P.L. Long EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Costwald Coefficient $\frac{1}{289.35}$ 2.81 0.714 298.35 2.73 0.685 0.748	083.
2. Benzene; C_6H_6 ; 71-43-2 VARIABLES: T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $X_1 \times 10^3$ α L	083.
2. Benzene; C_6H_6 ; 71-43-2 J. Phys. Chem. 1957, 61, 1078-1 VARIABLES: T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $X_1 \times 10^3$ α L	083.
VARIABLES: T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm) T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_1 \times 10^3$ α L	083.
VARIABLES: T/K: 289.35 - 313.45 PREPARED BY: P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Coefficient Coefficient $x_1 \times 10^3$ α L	083.
VARIABLES: T/K: 289.35 - 313.45 PREPARED BY: P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Coefficient Coefficient $x_1 \times 10^3$ α L	
T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_1 \times 10^3$ α L	
T/K: 289.35 - 313.45 P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_1 \times 10^3$ α L	
EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_1 \times 10^3$ α L	
T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $X_1 \times 10^3$ α L	
T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $X_1 \times 10^3$ α L	
$\frac{x_1 \times 10^3}{\alpha} \frac{\alpha}{L}$	
$\qquad \qquad $	
289.35 2.81 0.714 0.756 298.35 2.73 0.685 0.748	
1 298,35 2.73 0.685 0.748	
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln X_{1} = -1926.5 + 55.517 T$	
Std. Dev. $\Delta G^{\circ} = 6.2$, Coef. Corr. = .9999	
$\Delta H^{O}/J \text{ mol}^{-1} = -1926.5, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -55.517$	
T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$	
$x_1 \times 10^3$	
288.15 2.81 14071	
293.15 2.78 14348	
298.15 2.74 14626	
303.15 2.70 14903 308.15 2.67 15181	
308.15 2.67 15181 313.15 2.64 15458	
318.15 2.61 15736	
The solubility values were adjusted to a partial pressure of krypton o 101.325 kPa (1 atm) by Henry's law.	f
The Bunsen coefficients were calculated by the compiler.	
AUXILIARY INFORMATION	
METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS:	
Solvent was degassed by a modifi- cation of the method of Baldwin and Daniel (1). Saturation apparatus was	Co.
that of Morrison and Billett (2), modified to include spiral storage Co. Shaken with H ₂ SO ₄ , wate	
for the solvent, a manometer for washed, dried over Na, disti	
extra buret. Solvent was saturated	
with gas as it flowed through an	
8 mm x 180 cm glass spiral attached to a buret.	
NOTE: F. KÖRÖSY Trans. Faraday Soc. ESTIMATED ERROR:	
1937, 33, 416 reports an Ostwald $\delta T/K = 0.05$ coefficient of 0.97 (mole fraction $\delta P/mmHg = 3$	
3.55×10^{-3}) at 295.15 K. Van Liempt $\delta x / x = 0.03$	
and van Wijk Recl. trav. Chim. Pays- 1'1	
Bas 1937, 56, 632 report a Bunsen REFERENCES:	
coefficient of 0.67 (mole flaction	
the solubility of krypton in benzene J Appl. Chem. 1952. 2. 161.	
values were considered in the smooth-	
1 or a = 117 or a = 1217 or a = 1217	
2. Morrison, T.J.; Billett, F. J. <u>Chem. Soc.</u> 1948, 2033; ibid. 1952, 3819.	

1. Krypton; Kr; 7439-90-9 2. Methylbenzene (Toluene); C ₇ H _g ; 108-88-3 VARIABLES: T/K: 288.15 - 328.15 F/KPa: 101.325 (1 atm) EXTERIMENTAL VALUES: T/K Mol Fraction 298.15 298.15 313.15 313.15 313.15 313.15 313.15 313.15 313.15 313.15 2.91 $\frac{X_1 \times 10^3}{2}$ $\frac{x_1 \times 10^3}{2}$ $\frac{x_2 \times 10^3}{2}$ $\frac{x_2 \times 10^3}{2}$ $\frac{x_2 \times 10^3}{2}$ $\frac{x_2 \times 10^3}{2}$ $\frac{x_1 \times 10^3}{2}$ $\frac{x_2 \times 10^3}{2}$ $x_$	COMPONENTS:	ORIGINAL MEASUREMENTS:
2. Methylbenzene (Toluene); C_7H_6 ; 108-88-3 J. Phys. Chem. 1958, 62, 1334-1337. VARIABLES: T/K: 288.15 - 328.15 P/KPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction $\frac{x_1 \times 10^3}{288.15}$ $\frac{x_1 \times 10^3}{3.32}$ $\frac{x_1 \times 10^3}{1.328.15}$ $\frac{x_2}{3.37}$ $\frac{x_1 \times 10^3}{0.744}$ $\frac{x_1 \times 10^3}{0.745}$ Smoothed Data: $\Delta G^{\circ}/J$ mol ⁻¹ = - RT ln X ₁ = 3,686.3 + 59.752 T $\Delta H^{\circ}/J$ mol ⁻¹ = 3,686.3, $\Delta S^{\circ}/J$ K ⁻¹ mol ⁻¹ = -59.752 $\frac{T/K}{313.15}$ $\frac{3.52}{3.52}$ $\frac{13,531}{13,630}$ 298.15 $\frac{3.52}{298.15}$ $\frac{13,531}{293.15}$ 298.15 $\frac{3.52}{298.15}$ $\frac{13,531}{293.15}$ 298.15 $\frac{3.52}{298.15}$ $\frac{13,531}{293.15}$ 298.15 $\frac{3.52}{298.15}$ $\frac{13,531}{293.15}$ 298.15 $\frac{3.52}{298.15}$ $\frac{13,531}{293.15}$ T/K Mol Fraction $\Delta G^{\circ}/J$ mol ⁻¹ $\frac{x_1 \times 10^3}{288.15}$ $\frac{13,531}{293.15}$ 298.15 $\frac{3.52}{298}$ $\frac{13,531}{13,630}$ 298.15 $\frac{3.52}{298}$ $\frac{13,532}{15,523}$ The solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. The bunsen coefficients were calculated by the compiler. MULLIARY INFORMATION METHOD /APPARATUS/PROCEDURE: The solvent was degaased by evacu- sit passed as a thin film inside a glass helix which contained the sol- solpt and then optime tand van diageneric of 1 atm (1,2). The volume of liquid and the volume of gas ab- sorbed are determined in a system of burets. Evaluator's Note: Van Liempt and van MiX Reg1. Trav. Chin. Pays-Bas.1937 56, 637 Report a Bunsen coefficient Evaluator's Note: Van Liempt and van MiX Reg2. Trav. Chin. Pays-Bas.1937 57, 637 Report a Bunsen coefficient Evaluator's Note: Van Liempt and van MiX Reg2. Trav. Chin. Pays-Bas.1937 56, 637 Report a Bunsen coefficient Evaluator's Note: Van Liempt and van Set find the recommended for use. Evaluator's Note: Van Liempt and van Set find the recommended for use. Evaluator's Note: Van Liempt and van Set find the recommended for use. Evaluator's Note: Van Liempt and van Set find the recommended for use. Evaluator's Note: Van		
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$\begin{array}{c} 318.15 & 3.05 & 15,324 \\ 323.15 & 2.98 & 15,623 \\ 328.15 & 2.92 & 15,922 \\ \end{array}$ The solubility values were ajdusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calculated by the compiler. $\begin{array}{c} AUXILIARY \text{ INFORMATION} \\ \hline \\ \text{METHOD /APPARATUS/PROCEDURE:} \\ \hline \\ \text{The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of liquid and the volume of gas absorbed are determined in a system of burets. \\ \hline \\ \text{Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937 56, 632 report a Bunsen coefficient of 0.084 (mole fraction 4.0 x 10^{-3}) at 291.15 K for this system. The value is not recommended for use. \\ \hline \\ \begin{array}{c} 318.15 & 2.92 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,922 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,92 \\ 15,$		
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METHOD /APPARATUS/PROCEDURE:SOURCE AND PURITY OF MATERIALS:The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of liquid and the volume of gas ab- sorbed are determined in a system of burets.1. Krypton. Matheson Co., Inc. Research grade.Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10^{-3}) at 291.15 K for this system. The value is not recommended for use.SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., Inc. Research grade.Source AND PURITY OF MATERIALS: SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co., Inc. Research grade.Source AND PURITY OF MATERIALS: Lawing, and then passing it as a fine mist grade. Shaken over conc. H2SO4 water washed, dried over Drierite, distilled b.p. 110.40 110.60° C.Evaluator's Note: Source And Purity OF MATERIALS: Drierite, distilled b.p. 110.40 Source And Purity OF MATERIALS: Lawing, and the sol- Drierite, distilled b.p. 110.40 Source And Purity OF MATERIALS: Lawing, Source And Purity OF MATERIALS: Lawing, Source And Purity OF MATERIALS: Lawing, Source And Purity OF MATERIALS: Lawing, Matheson Co., Inc. Research grade.Source And Purity OF MATERIALS: Lawing, Alter And Purity OF MATERIALS: Source And Purity OF MATERIALS: Lawing Alter And Purity OF MATERIALS: Lawing Alter Antonia Alter Antonia Alter Antonia Alter Antonia Alter Alter Alter Alter Alter Alter Alter Alter Alter Alt		
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<pre>into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the sol- ute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of liquid and the volume of gas ab- sorbed are determined in a system of burets.</pre> 2. Toluene. Mallinckrodt. Reagent grade. Shaken over conc. H ₂ SO ₄ , water washed, dried over Drierite, distilled b.p. 110.40 110.60° C. Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use. 2. Toluene. Mallinckrodt. Reagent grade. Shaken over conc. H ₂ SO ₄ , water washed, dried over Drierite, distilled b.p. 110.40 110.60° C. ESTIMATED ERROR: ESTIMATED ERROR: ESTIMATED ERROR: 8. ESTIMATED ERROR: ESTIMATED ERROR: 8. ESTIMATED ERROR: 8. 8. 8. 8. 8. 8. 8. 8. 9. 9. 9. 9. 9. 9. 9. 9. 9. 9		Research grade.
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glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of liquid and the volume of gas ab- sorbed are determined in a system of burets.Drierite, distilled b.p. 110.40 110.60° C.Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use.Drierite, distilled b.p. 110.40 110.60° C.Drierite, distilled b.p. 110.40 110.60° C.Drierite, distilled b.p. 110.40 110.60° C.Sorbed are determined in a system of burets.ESTIMATED ERROR:ESTIMATED ERROR:ISTIMATED ERROR:		
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of liquid and the volume of gas ab- sorbed are determined in a system of burets. Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937, 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/torr = 3$ $\delta X_1/X_1 = 0.005$ REFERENCES: 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;	ute gas plus solvent vapor at a total	110.60° C.
sorbed are determined in a system of burets. Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937, 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/torr = 3$ $\delta X_1/X_1 = 0.005$ REFERENCES: 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;	of liquid and the volume of gas ab-	
Evaluator's Note: Van Liempt and van Wijk Recl. Trav. Chim. Pays-Bas, 1937, 56, 632 report a Bunsen coefficient of 0.84 (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/torr = 3$ $\delta X_1/X_1 = 0.005$ REFERENCES: 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;	sorbed are determined in a system of	
Wijk Recl. Trav. Chim. Pays-Bas, 1937 $\delta P/torr = 3$ 56, 632 report a Bunsen coefficient $\delta X_1/X_1 = 0.005$ \overline{of} 0.84 (mole fraction 4.0 x 10 ⁻³) atREFERENCES:291.15 K for this system. The value1. Morrison, T. J.; Billett, F. $J.$ Chem. Soc. 1948, 2033;	burets.	ESTIMATED ERROR:
Wijk Recl. Trav. Chim. Pays-Bas, 1937, 56, 632 report a Bunsen coefficient $\overline{of} 0.84$ (mole fraction 4.0 x 10 ⁻³) at 291.15 K for this system. The value is not recommended for use. 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;		$\delta m/\nu = 0.03$
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is not recommended for use. J. Chem. Soc. 1948, 2033;	or 0.84 (mole fraction 4.0 x 10^{-3}) at 291.15 K for this system. The value	REFERENCES:
<u>ibid</u> , 1952, 3819.	is not recommended for use.	J. Chem. Soc. 1948, 2033;
2. Baldwin, R. R.; Daniel, S. G. J. <u>Appl. Chem</u> . 1952, <u>2</u> , 161.		2. Baldwin, R. R.; Daniel, S. G.

COMPONENTS: 1. Krypton; Kr; 7439	9-90-9	ORIGINAL MEAS Byrne, J.E. Wilhelm	; Battino, R.;
<pre>2. 1,2-Dimethylbenze C₈H₁₀; 95-47-6</pre>	ene (<u>o</u> -Xylene);	WIINEIM	,
		J. Chem. Th	<u>ermodyn</u> . 1975, <u>7</u> , 515-52
VARIABLES: T/K: 298.12 P/kPa: 101.32	2 - 298.15 25 (1 atm)	PREPARED BY:	H.L. Clever
EXPERIMENTAL VALUES:			
T/K	Mol Fraction	Bunsen	Ostwald
	$\frac{x_1 \times 10^3}{2}$	Coefficient a	Coefficient L
298.12 298.12 298.13 298.15	2 3.379 3 3.368	0.6257 0.6270 0.6248 0.6266	0.6829 0.6843 0.6819 0.6840
	AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCH The apparatus is h design by Morrison ar and the version used Battino, Evans, and H Degassing. Up to vent is placed in a d size that the liquid deep. The liquid is and vacuum is applied through a liquid N ₂ t permanent gas residua	EDURE: based on the bd Billett (1) is described by Danforth (2). 500 cm ³ of sol- flask of such is about 4 cm rapidly stirred, d intermittently trap until the	SOURCE AND PU 1. Krypton Chemica Inc. 99 2. 1,2-Dim Petrole	RITY OF MATERIALS: . Either Air Products & ls, Inc., or Matheson Co- mol % or better. Methylbenzene. Phillips Num Co. Pure grade.
The apparatus is h design by Morrison ar and the version used Battino, Evans, and H Degassing. Up to vent is placed in a size that the liquid deep. The liquid is and vacuum is applied through a liquid N ₂ to	EDURE: based on the hd Billett (1) is described by Danforth (2). 500 cm ³ of sol- flask of such is about 4 cm rapidly stirred, d intermittently trap until the al pressure drops ination. The de- s in a thin film tube containing the solvent vapor of one atm. The ed is found by he initial and the buret system.	SOURCE AND PU 1. Krypton Chemica Inc. 99 2. 1,2-Dim Petrole ESTIMATED ERF δ REFERENCES: 1. Morrisc <u>J. Chem</u>	. Either Air Products & ls, Inc., or Matheson Co. mol % or better. methylbenzene. Phillips um Co. Pure grade.

1. Krypton; K			ORIGINAL MEAS	UREMENTS:
	1. Krypton; Kr; 7439-90-9		Byrne, J.E.; Battino, R.;	
2. 1,3-Dimeth C ₈ H ₁₀ ; 108	nylbenzene (<u>m</u> 1-38-3	<u>1</u> -Xylene);	Wilhelm	, E.
			<u>J</u> . <u>Chem</u> . <u>Th</u>	<u>ermodyn</u> . 1975, <u>7</u> , 515-522.
VARIABLES:			PREPARED BY:	n 2
T/K: P/kPa:	298.18 - 29 101.325 (1			H.L. Clever
EXPERIMENTAL VALU	ES:			•••••••••••••••••••••••••••••••••••••••
	T/K Mol	Fraction	Bunsen	Ostwald
			Coefficient	Coefficient
	X	$x_1 \times 10^3$	α	L
	298.18	3.624	0.6598	0.7203
	298.20	3.629	0.6609	0.7215
	298.21 298.21	3.629 3.632	0.6608 0.6614	0.7214 0.7221
		AUXILIARY	INFORMATION	
METHOD		AUXILIARY		
METHOD The apparatu design by Morr and the versic Battino, Evans	on used is de	on the lett (1) escribed by	SOURCE AND PL 1. Krypto Chemic Inc. 9	WRITY OF MATERIALS: n. Either Air Products & als, Inc., or Matheson Co. 9 mol % or better. methylbenzene. Phillips
The apparatu design by Morr and the versic Battino, Evans	rison and Bil on used is de s, and Danfor EDURE: Up to 500 cm a flask of su about 4 cm d dly stirred, cermittently	on the lett (1) escribed by th (2). a ³ of solven the size tha leep. The and vacuum through a	SOURCE AND PL 1. Krypto Chemic Inc. 9 2. 1,3-Di Petrol t	n. Either Air Products & als, Inc., or Matheson Co. 9 mol % or better. methylbenzene. Phillips eum Co., pure grade.
The apparatu design by Morr and the versic Battino, Evans APPARATUS/PROCE Degassing. is placed in a the liquid is liquid is rapi is applied int liquid N ₂ trap gas residual p 5 microns. Solubility E	cison and Bil on used is de s, and Danfor EDURE: Up to 500 cm a flask of su about 4 cm d dly stirred, cermittently o until the p pressure drop Determination	on the lett (1) escribed by th (2). a ³ of solven ich size tha leep. The and vacuum through a bermanent os to a. The de-	SOURCE AND PL 1. Krypto Chemic Inc. 9 2. 1,3-Di Petrol t t ESTIMATED ERI 6	<pre>n. Either Air Products & als, Inc., or Matheson Co. 9 mol % or better. methylbenzene. Phillips eum Co., pure grade. ROR:</pre>
The apparatu design by Morr and the versic Battino, Evans APPARATUS/PROCE Degassing. is placed in a the liquid is liquid is rapi is applied int liquid N ₂ trap gas residual p 5 microns.	cison and Bil on used is de s, and Danfor DURE: Up to 500 cm a flask of su about 4 cm d dly stirred, cermittently o until the p oressure drop Determination c passes in a spiral tube of essure of one absorbed is cween the ini mm in the bu	on the lett (1) escribed by th (2). a ³ of solven ich size tha leep. The and vacuum through a bermanent os to a. The de- thin film containing olvent vapor e atm. The found by tial and iret system.	SOURCE AND PL 1. Krypto Chemic Inc. 9 2. 1,3-Di Petrol t t ESTIMATED ERI 6 REFERENCES: 1. Morris J. Che	n. Either Air Products & als, Inc., or Matheson Co. 9 mol % or better. methylbenzene. Phillips eum Co., pure grade.

	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.
<pre>2. l,4-Dimethylbenzene (p-Xylene); C₈H₁₀; 106-42-3</pre>	<u>J. Phys</u> . <u>Chem</u> . 1957, <u>61</u> , 1082-1083.
VARIABLES: T/K: 303.15 P/kPa: 101.325 (1 atm)	PREPARED BY: C.E. Edelman A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction $x_1 \times 10^3$	Bunsen Ostwald Coefficient Coefficient α L
303.15 3.81	0.687 0.762
The solubility value was adjusted to 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficient was calculate	
ΔΙΙΧΤΙΤΔΡΥ	INFORMATION
ME THOD:	
Volumetric. The solvent is satu- rated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. 2. 1,4-Dimethylbenzene. Eastman Kodak white label. Fractionally crystalized twice, dried over Na, distilled, b.p. 138.0-138.2°C.
rated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. 2. 1,4-Dimethylbenzene. Eastman Kodak white label. Fractionally crystalized twice, dried over Na,

	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	Byrne, J.E.; Battino, R.; Wilhelm, E.		
<pre>2. 1,4-Dimethylbenzene (p-Xylene); C₈H₁₀; 106-42-3</pre>	WIINELU, E.		
	J. Chem. Thermodyn. 1975, 7, 515-522.		
VARIABLES:	PREPARED BY:		
T/K: 298.14 - 298.27 P/kPa: 101.325 (1 atm)	H.L. Clever		
EXPERIMENTAL VALUES:	I		
T/K Mol Fraction	Bunsen Ostwald		
	Coefficient Coefficient		
$x_1 \times 10^3$	α L		
298.14 3.779	0.6860 0.7488		
298.17 3.816	0.6927 0.7562		
298.19 3.810 298.19 3.844	0.6916 0.7550 0.6978 0.7618		
298.21 3.806 298.27 3.796	0.6847 0.7574 0.6889 0.7523		
	0.0009 0.7525		
AUXILIARY	INFORMATION		
METHOD:	SOURCE AND PURITY OF MATERIALS:		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by			
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips 		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2).	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better.		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred,	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips 		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips 		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips Petroleum Co., pure grade. ESTIMATED ERROR:</pre>		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent passes in a thin film	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips Petroleum Co., pure grade. ESTIMATED ERROR:</pre>		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent passes in a thin film down a glass spiral tube containing the solute gas plus the solvent vapor at a total pressure of one atm. The	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips Petroleum Co., pure grade. ESTIMATED ERROR:</pre>		
METHOD: The apparatus is based on the de- sign by Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). APPARATUS/PROCEDURE: Degassing. Up to 500 cm ³ of solvent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent passes in a thin film down a glass spiral tube containing the solute gas plus the solvent vapor	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals, Inc., or Matheson Co. Inc. 99 mol % or better. 2. 1,4-Dimethylbenzene. Phillips Petroleum Co., pure grade. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta x_1/x_1 = 0.02$ REFERENCES: 1. Morrison, T.J.; Billett, F.		

COMPONENTS:		ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 743	9-90-9	van Liempt, J.A.M.; van Wijk, W.
2. Industrial Hydro	carbons	
		Rec.Trav.Chim.Pays-Bas 1937, <u>56</u> , 632 - 634.
VARIABLES:		PREPARED BY:
	65 - 293.15 325 (1 atm)	H. L. Clever
EXPERIMENTAL VALUES:		
	T/K Buns Coeffi	en Ostwald cient Coefficient
	Gasoline	
	292.15 0.8	9 0.95
	Paraffin oil	
	291.65 0.6	0 0.64
	Petroleum 293.15 1.0	0 1.07
	AUXILIARY	INFORMATION
ME THOD :	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:
The apparatus app	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given.
	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given.
The apparatus app to the Winkler type	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon.
The apparatus app to the Winkler type	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon.
The apparatus app to the Winkler type	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon.
The apparatus app to the Winkler type	ears to be similar	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon. 2. Solvents. No information given.</pre>
The apparatus app to the Winkler type	ears to be similar	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon.
The apparatus app to the Winkler type Körösy (1).	ears to be similar	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon. 2. Solvents. No information given. ESTIMATED ERROR:</pre>
The apparatus app to the Winkler type Körösy (1).	ears to be similar	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon. 2. Solvents. No information given. ESTIMATED ERROR:</pre>
The apparatus app to the Winkler type Körösy (1).	ears to be similar	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon. 2. Solvents. No information given. ESTIMATED ERROR:</pre>
The apparatus app to the Winkler type Körösy (1).	ears to be similar	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Contained 5 % xenon. 2. Solvents. No information given. ESTIMATED ERROR:</pre>

			ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9		-90-9	Steinberg, M.; Manowitz, B.
2. Hydroca	2. Hydrocarbons		
			Ind. and Eng. Chem., 1959, 51, 47-50
VARIABLES:	/K: 296.15	- 200 65	PREPARED BY:
	Pa: 101.32		H.L. Clever, P.L. Long, A.L. Crame
EXPERIMENTAL V	VALUES:	······································	1
	т/к	Absor	ption Coefficient*
	296.15	"Ultrasene" (pa	raffins 80 wt %, napthenes
			0.58
	298.65	1,3,5-Trimethyl C ₉ H ₁₂ ; 108-67-8	benzene (Mesitylene);
		5 12	0.63
	298.15	Diphenylbenzene 26140-60-3	e (Terphenyl); C ₁₈ H ₁₄ ;
			0.30
*Volume of system pres 288.15 K).	gas (corre sure of l	cted to 288.15 K atm, per unit vol	and 1 atm) absorbed under a total .ume of solvent (corrected to
system pres	gas (corre sure of 1	cted to 288.15 K atm, per unit vol	and 1 atm) absorbed under a total .ume of solvent (corrected to
system pres	gas (corre sure of 1	atm, per unit vol	and 1 atm) absorbed under a total .ume of solvent (corrected to INFORMATION
system pres 288.15 K).	sure of 1	atm, per unit vol	ume of solvent (corrected to INFORMATION
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol	ume of solvent (corrected to
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co.
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technically pure. 2. Ultrasene. Atlantic Refining Co Mesitylene. No source. Technical grade. Terphenyl. No source.
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technically pure. 2. Ultrasene. Atlantic Refining Co Mesitylene. No source. Technical grade. Terphenyl. No source.
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technically pure. 2. Ultrasene. Atlantic Refining Co Mesitylene. No source. Technical grade. Terphenyl. No source. Technical grade.
system pres 288.15 K). METHOD/APPAI	sure of 1 RATUS/PROCI	atm, per unit vol AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Matheson Co. Technically pure. 2. Ultrasene. Atlantic Refining Co Mesitylene. No source. Technical grade. Terphenyl. No source. Technical grade. ESTIMATED ERROR:

1

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COMPONENTS:		ORIGIN	AL MEASUREMEN	TS:	
l. Krypton; Kr; 7439-90-9			Steinberg, M.; Manowitz, B.		
. Amsco 123-15					
		Ind	Eng. Chem.	1959 51	47-50
		<u></u> .	<u>ung</u> . <u>enem</u> .	1999, <u>91</u> ,	47-30.
VARIABLES:		PREPAI	RED BY:		
T/K: 218.15 - 42 P/kPa: 101.325 (1)			H.L. C	10000	
I) XLU: 101.525 (1)			n.u. C	lever	
EXPERIMENTAL VALUES:					
Kry	pton at on	e atm	Krypton at ln	low conc ^N 2	
		enry's	Krypton	Henry's	
Coef:		onstant K/atm	Initial ppm in N ₂	Constant K/atm	
	1.50	70	41.6	71	
	0.56 0.44	190 238	48 92	173 251	
373.15	0.30	-	-	_	
	0.34 0.19	313 544	92 92	290 497	
	AUXILIA	ARY INFORM	ATION		
METHOD/APPARATUS/PROCEDUPP)F MATERIALS	
METHOD/APPARATUS/PROCEDURE: The absorption coeffici		SOURC	E AND PURITY C		
The absorption coeffici atm krypton was measured b	ent at on	SOURCI		atheson Co.	
The absorption coeffici atm krypton was measured h McDaniel method (1). The Henry's constant	ient at on by modified	e 1. d 2.	E AND PURITY C Krypton. M Technical g Amsco 123-1	atheson Co rade. 5. America	., Inc. an Mineral
The absorption coefficient atm krypton was measured by McDaniel method (1). The Henry's constant (K = (P/atm)/X ₁) at low co	ient at on by modified oncentratio	e 1. d 2.	E AND PURITY C Krypton. M Technical g Amsco 123-1 Spirits Co.	atheson Co rade. 5. America No. 140.	., Inc. An Mineral Paraffin
The absorption coeffici atm krypton was measured h McDaniel method (1). The Henry's constant	ient at on by modified oncentratio y static an log (Abson s linear	e 1. d 2. on nd rp-	E AND PURITY C Krypton. M Technical g Amsco 123-1	atheson Co rade. 5. America No. 140. naphthene 2	., Inc. An Mineral Paraffin
The absorption coefficient atm krypton was measured by McDaniel method (1). The Henry's constant (K = (P/atm)/X ₁) at low constant of krypton was measured by dynamic tracer techniques. The authors state that tion Coefficient) vs 1/T is and gives an enthalpy of states	ient at on by modified oncentratio y static an log (Abson s linear	source d 1. on nd rp- f	E AND PURITY C Krypton. M Technical g Amsco 123-1 Spirits Co. 59.6 wt %,	atheson Co rade. 5. America No. 140. naphthene 2	., Inc. An Mineral Paraffin
The absorption coefficient atm krypton was measured by McDaniel method (1). The Henry's constant (K = (P/atm)/X ₁) at low constant of krypton was measured by dynamic tracer techniques. The authors state that tion Coefficient) vs 1/T is and gives an enthalpy of states	ient at on by modified oncentratio y static an log (Abson s linear	source e 1. d 2. on nd rp- f ESTIM δK/	E AND PURITY C Krypton. M Technical g Amsco 123-1 Spirits Co. 59.6 wt %, s aromatics 1.	atheson Co rade. 5. America No. 140. naphthene 2 3.2 wt %. 0.10 (McDar	., Inc. an Mineral Paraffin 27.3 wt %,
The absorption coefficient atm krypton was measured by McDaniel method (1). The Henry's constant (K = (P/atm)/X ₁) at low constant of krypton was measured by dynamic tracer techniques. The authors state that tion Coefficient) vs 1/T is and gives an enthalpy of states	ient at on by modified oncentratio y static an log (Abson s linear	e 1. d 2. on nd rp- f ESTIM δK/	E AND PURITY C Krypton. M Technical g Amsco 123-1 Spirits Co. 59.6 wt %, s aromatics 1. ATED ERROR: K = 0.05 - 0	atheson Co rade. 5. America No. 140. naphthene 2 3.2 wt %. 0.10 (McDar	., Inc. an Mineral Paraffin 27.3 wt %,
The absorption coefficient atm krypton was measured by McDaniel method (1). The Henry's constant (K = (P/atm)/X ₁) at low constant of krypton was measured by dynamic tracer techniques. The authors state that tion Coefficient) vs 1/T is and gives an enthalpy of states	ient at on by modified oncentratio y static an log (Abson s linear	$\begin{array}{c} \text{SOURC}\\ \text{e} & 1.\\ \text{d} & 2.\\ \text{on} & \\ \text{nd} & \\ \text{rp-} & \\ \text{f} & \\ \hline & \\ \hline & \\ \text{ESTIM} & \\ \delta \text{K} / \\ \delta \text{K} / \\ \hline & \\ \text{REFER} \\ 1. & \\ \end{array}$	E AND PURITY C Krypton. M Technical g Amsco 123-1 Spirits Co. 59.6 wt %, : aromatics 1 ATED ERROR: K = 0.05 - K K = 0.18 (Tr	atheson Co rade. 5. America No. 140. naphthene 2 3.2 wt %. 0.10 (McDar racer metho . "Scott's Chemical Ar d Co., NY 1	., Inc. an Mineral Paraffin 27.3 wt %, niel method ods) Standard alysis" .939,

COMPONENTS :	EVALUATOR:	
1. Krtypton; Kr; 7439-90-9	H. L. Clever Chemistry Department	
2. Methanol; CH ₄ O; 64-56-1	Emory University Atlanta, GA 30322 USA	
	May 1978	

CRITICAL EVALUATION:

The solubility of krypton in methanol was measured in several laboratories. Only one laboratory reports krypton in methanol solubility values at more than one temperature. Thus, it is not possible to intercompare data from the different laboratories and recommend a set of solubility values and thermodynamic parameters for the system.

Van Liempt and van Wijk (1) report a Bunsen coefficient of 0.52 (mole fraction 0.94 x 10^{-3}) at 291.15 K. Steinberg and Manowitz (2) report an absorption coefficient (volume of gas corrected to 288.15 K and 101.325 kPa absorbed under a total system pressure of 101.325 kPa per unit volume of solvent calculated at 288.15 K) of 1.06 at 144.15 to 153.15 K in the methanol + water eutectic (83 weight percent methanol). Komarenko and Manzhelii (3) report five solubility values between 176.15 and 213.15 K measured at a krypton pressure of 26.664 kPa (200 mmHg). The compiler has recalculated these at 101.325 kPa assuming Henry's law is obeyed.

It is not possible to judge the reliability of the single solubility values of van Liempt and van Wijk and of Steinberg and Manowitz. Data sheets on them are not included. Both the methanol and the krypton used by Komarenko and Manzhelii are of exceptional purity. Their degassing technique is thorough. The solubility method appears reliable, and their data should be of good quality. The Komarenko and Manzhelii solubility values were fitted to a three constant equation by the method of least squares. The smoothed solubility values at 101.325 kPa and the values of the thermodynamic changes for the transfer of krypton from the gas at 101.325 kPa to the hypothetical unit mole fraction solution for the temperature interval of 173.15 to 213.15 K are given on the data sheet which follows.

Although recommended solubility of krypton in methanol values are not given, a tentative set of values based on the five low temperature values of Komarenko and Manzhelii and the single room temperature value of von Liempt and van Wijk is given. This set of values should be used with extreme caution until more work is done on the system. The solubility equation is

 $\ln X_1 = -12.625 + 11.868/(T/100) + 1.4776 \ln (T/100)$

Solubility values and values of thermodynamic parameters are given in Tables 1 and 2.

TABLE 1. Tentative values of the solubility of krypton in methanol at 101.325 kPa.

т/к	Mol Fraction $X_1 \times 10^3$	т/к	Mol Fraction X ₁ × 10 ³
173.15	7.01	243.15	1.61
183.15	5.24	253.15	1.41
193.15	4.05	263.15	1.25
203.15	3.23	273.15	1.12
213.15	2.63	283.15	1.01
223.15	2.20	293.15	0,92
233.15	1.87		

Tentative values for the transfer of one mole of TABLE 2. krypton from the gas at 101.325 kPa to the hypothetical unit mole fraction solution.

Т/К	$\Delta G^{O}/J \text{ mol}^{-1}$	ΔH ^O /J mol ⁻¹	$\Delta S^{O}/JK^{-1}mol^{-1}$	ΔCp/JK ⁻¹ mol ⁻¹
193.15	8,845	-7,494	-84.60	12.29
293.15	17,031	-6,266	-79.47	12.29

van Liempt, J.A.M.; von Wijk, W. 1.

Rec. Trav. Chim. Pays-Bas 1937, <u>56</u>, 632. Steinberg, M.; Manowitz, B. Ind. Eng. Chem. 1959, <u>51</u>, 47. Komarenko, V.G.; Manzhelii, V.G. Ukr. Fiz. Zh. (Ukr. Ed.) 1968, <u>13</u>, 387. 2.

3.

1. Kry	IS:		ORIGINAL MEASUREMENTS:	
1. NI Y	pton; Kr; 7439	-90-9	Komarenko, V.G.; Manzhelii, V.G.	
2. Met	hanol; CH ₄ O; 6	4-56-1		
			<u>Ukr.Fiz.Zh.(Ukr.Ed.)</u> 1968, <u>13</u> ,387-3 <u>Ukr. Phys. J.</u> 1968, <u>13</u> , 273-276.	391
VARIABLE	S: T/K: 176.15 P/kPa: 26.664		PREPARED BY: T.D. Kittredge	<u> </u>
EXPERIME	NTAL VALUES:			
		T/K Mol Frac P/mmHg X ₁ X	$\begin{array}{ccc} \text{Mol Fraction} \\ 200 \text{P/mmHg} & 760 \\ 10^3 & X_1 \times 10^3 \end{array}$	
		176.151.76183.151.30193.151.04203.150.84213.150.71	7 4.967 5 3.971 5 3.21	
Smoothe	d Data: lnX ₁	= -40.0423 + 43.	7246/(T/100) + 18.0139 ln (T/100)	
T/K	Mol Fraction $x_1 \times 10^3$	ΔG ^O /kJmol ⁻¹ ΔH	$P/kJmol^{-1} \Delta S^{O}/JK^{-1}mol^{-1} \Delta C_{p}^{O}/JK^{-1}r$	mol
173.15 183.15 193.15 203.15 213.15	7.44 5.15 3.90 3.18 2.75		-10.42 -100.9 149.8 -8.923 -92.5 " -7.425 -84.5 " -5.928 -77.00 " -4.430 -69.80 "	
	e mole fractio y's law by the		101.325 kPa (760 mmHg) was calculate	ed
		compiler.	l0l.325 kPa (760 mmHg) was calculate	ed
by Henr	y's law by the	compiler.	lol.325 kPa (760 mmHg) was calculate	ed
METHOD / The A thin 125-175	y's law by the APPARATUS/PROC solvent was de layer of alcoh K, was kept f	AUXILIARY EDURE: gassed by vacuum ol, cooled to or 20 hours in a	<pre>IO1.325 kPa (760 mmHg) was calculate INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Purity by chromatographic meth was 99.89 per cent.</pre>	hod
METHOD / The A thin 125-175 Vacuum The under v placed tus con cury co cell di gas pre tempera	APPARATUS/PROC solvent was de layer of alcoh K, was kept f maintained at degassed liqui acuum in an am in the apparat sisted of a ma mpensator, and vided by a mer ssure of 200 m ture were esta	AUXILIARY EDURE: gassed by vacuum ol, cooled to or 20 hours in a 10 ⁻³ mmHg. d was sealed poule which was us. The appara- nostat, a mer- a solubility cury seal. A mHg and the blished. The	 IOI.325 kPa (760 mmHg) was calculate INFORMATION SOURCE AND PURITY OF MATERIALS: Krypton. Source not given. Purity by chromatographic methwas 99.89 per cent. Methanol. Purified and analy: in the All-Union Sci. Res. In: for Single Crystals & High-Pur Substances. Purity 99.97 weig per cent. 	hod zed st.
METHOD / The A thin 125-175 Vacuum The under v placed tus con cury co cell di gas pre tempera foil en The gas through amount by the compens Some	APPARATUS/PROC solvent was de layer of alcoh K, was kept f maintained at degassed liqui acuum in an am in the apparat sisted of a ma vided by a mer ssure of 200 m ture were esta ds of the ampo dissolved as a series of s of gas dissolv rise in mercur ator. measurements	AUXILIARY EDURE: gassed by vacuum ol, cooled to or 20 hours in a 10 ⁻³ mmHg. d was sealed poule which was us. The appara- nostat, a mer- a solubility cury seal. A mHg and the blished. The ule were pierced the liquid flowe	101.325 kPa (760 mmHg) was calculated INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Purity by chromatographic methwas 99.89 per cent. 2. Methanol. Purified and analysin the All-Union Sci. Res. Instormation Sci. Res. Instormation Substances. Purity 99.97 weighted per cent. Bestimated ERROR: a $\delta T/K = 0.05$ $\delta P/mmHg = 0.01$ $\delta X_1/X_1 = 0.005$	hod zed st.

COMPONENTS:	EVALUATOR:
<pre>1. Krypton; Kr; 7439-90-9 2. Ethanol; C₂H₆O; 64-17-5</pre>	H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 USA
	May 1978

CRITICAL EVALUATION:

Komarenko and Manzhelii (1) report eight values of the solubility of krypton in ethanol at 26.664 kPa (200 mmHg) between 159.15 and 223.15 K. We are not aware of any other measurements of the solubility of krypton in pure ethanol. However, van Liempt and van Wijk (2) report a Bunsen coefficient of 0.51 at 292.15 K in 96 per cent ethanol and 0.67 in 97½ per cent ethanol. Krestov and Nedelko (4) have calculated the solubility and the themodynamic properties of krypton in ethanol + water mixtures over the 303 to 343 K temperature range by a comparative method using argon data as the reference. We have not been able to obtain a copy of their paper.

Komarenko and Manzhelii used krypton and ethanol of exceptional purity. Their degassing technique is thorough, the solubility method appears reliable, and their data should be of good quality. The Komarenko and Manzhelii values were fitted to a three constant equation by the method of least squares. The equation, the smoothed solubility values at 101.325 kPa, and the values of the Thermodynamic parameters for the transfer of one mole of krypton from the gas at 101.325 kPa to the hypothetical unit mole fraction solution are given on the Komarenko and Manzhelii data sheet which follows.

- Komarenko, V.G.; Manzhelii, V.G. <u>Ukr</u>. <u>Fiz</u>. <u>Zh</u>. (<u>Ukr</u>. <u>Ed</u>.) 1968, <u>13</u>, 387.
- van Liempt, J.A.M.; van Wijk, W. <u>Rec. Trav. Chim. Pays-Bas</u> 1937, <u>56</u>, 632.
- 3. Körösy, F. Trans. Faraday Soc. 1937, 33, 416.
- Krestov, G.A.; Nedelko, B.E. <u>Tr. Ivanov. Khim. Tekhnol. Inst.</u> 1970, No. 12, 38. <u>Chem. Abstr. 1972, 77, 93469n; 1974, 80, 7706v.</u>

COMPONENT	·····		
1			ORIGINAL MEASUREMENTS:
1. Kry	pton; Kr; 7439-	-90-9	Komarenko, V.G.; Manzhelii, V.G.
2. Eth	anol; C ₂ H ₆ O; 64	4-17-5	
			<u>Ukr.Fiz.Zh. (Ukr.Ed.)</u> 1968, <u>13</u> ,387-391. <u>Ukr. Phys. J.</u> 1968, <u>13</u> , 273-276.
VARIABLES	S:		PREPARED BY:
	T/K: 159.15		T D Kittrodgo
	P/kPa: 26.664	(200 mmHg)	T.D. Kittredge
EXPERIMEN	NTAL VALUES:		
			tion Mol Fraction
ļ		P/mmHg	200 P/mmHg 760
		X ₁ × 1	$x_1 \times 10^3$
		159.15 4.23	16.1
		163.153.72173.152.80	
		183.15 2.15	5 8.189
		193.15 1.68 203.15 1.35	
		213.15 1.13	0 4.294
		223.15 0.96	0 3.648
Smoothe	+		054/(T/100) + 0.291181 ln(T/100)
Т/К	Mol Fraction	ΔG ^O /kJmol ⁻¹ ΔH ^C	/kJmol ⁻¹ $\Delta s^{o}/JK^{-1}mol^{-1} \Delta cp^{o}/JK^{-1}mol^{-1}$
	$x_1 \times 10^3$		
163.15	14.2	5.775 -	6.939 -77.92 2.42
173.15	10.6 8.12	6.553 - 7.330 -	6.914 -77.78 " 6.890 -77.64 "
193.15	6.43	8.105 -	-6.866 -77.52 "
203.15	5.21	8.880 -	6.842 -77.39
213.15	4.31 3.63		6.818 -77.28 " 6.793 -77.17 "
Th by Henr	ne mole fractio cy's law by the	n solubility at l compiler.	.01.325 kPa (760 mmHg) was calculated
	<u></u>	AUXILIARY	INFORMATION
METHOD /A	APPARATUS/PROCE		SOURCE AND PURITY OF MATERIALS:
		gassed by vacuum.	
A thin	layer of alcoh	ol, cooled to	Purity by chromatographic method
125-175	5 K, was kept f maintained at	or 20 hours in a 10^{-3} mmWg	was 99.89 per cent.
	degassed liqui		2. Ethanol. Purified and analyzed
		poule which was	in the All-Union Sci. Res. Inst. for Single Crystals & High-
	in the apparat consisted of a		Purity Substances. Purity 99.97
		and a solubility	weight per cent.
	lvided by a mer essure of 200 m		
tempera	ature were esta	blished. The	
foil er	nds of the ampo s dissolved as	ule were pierced. the liquid	
flowed	through a seri	es of small cups.	$\delta T/K = 0.05$ $\delta P/mmHg = 0.01$
The amo	ount of gas dis	solved was deter- mercury level in	$\delta x_1 / x_1 = 0.005$
the con	mpensator.		
		were made at 400 The results con-	REFERENCES :
	that Henry's 1		
L			

COMPONENT	гс.		ORIGINAL MEASUREMENTS:		
1. Kry	pton; Kr; 7439-	90-9	Komarenko, V.G.; Manzhe	111, V.G.	
2. 1-Propanol; C ₃ H ₈ O; 71-23-8					
			<u>Ukr.Fiz.Zh.(Ukr.Ed.)</u> 19 <u>Ukr.Phys.J.</u> 1968, <u>13</u> ,	68, <u>13</u> ,387-391. 273-276.	
VARIABLE	S:		PREPARED BY:		
	T/K: 163.15				
	P/kPa: 26.664	(200 mmHg)	T.D. Kittredge		
EXPERIME	NTAL VALUES:		hion Mal Buachian		
Į		T/K Mol Frac P/mmHg	tion Mol Fraction 200 P/mmHg 760		
			$x_1 \times 10^3$		
		163.15 4.84	18.4		
		173.15 3.64			
		183.152.79193.152.18			
		203.15 1.77			
		213.151.47223.151.24	3 5.597 0 4.712		
		233.15 1.24			
		243.15 0.98			
Smoothe	ed Data: ln X ₁	= 17.3988 - 30.7 + 10.8454 (T/1	777/(T/100) - 41.3191 ln 00)	(T/100)	
		· · · ·	/kJmol ⁻¹ $\Delta s^{\circ}/J \kappa^{-1}$ mol ⁻¹	Acr ⁰ /1,-1	
Т/К	MOL Fraction	AG /KJMOI - AH	/KJMOI $\Delta S^{-}/JK^{-}mol^{-}$	∆CD \]K _wol	
	$x_1 \times 10^3$				
163.15	18.4	5.422 -	6.457 -72.81	-49.31	
173.15	13.8	6.163 -	6.859 -75.21	-31.27	
183.15	10.6 8.33		7.083 -76.47 7.125 -76.70	-13.24 +4.79	
203.15	6.705		6.987 -76.00	22.83	
213.15	5.544		6.668 -74.48	40.86	
223.15	4.711 4.115		$\begin{array}{rrrr} 6.169 & -72.19 \\ 5.490 & -69.22 \end{array}$	58.90 76.93	
243.15	3.695		4.631 -65.61	94.97	
		AUXILIARY	INFORMATION		
METHOD/F	APPARATUS/PROCE	DURE:	SOURCE AND PURITY OF MATERIA	LS:	
		gassed by vacuum.			
125-175		or 20 hours in a	Purity by chromatog was 99.89 per cent.	raphic method	
	maintained at 1		2. 1-Propanol. Purifi	ed and analvzed	
	degassed liquid	d was sealed puole which was	in the All-Union Sc	i. Res. Inst.	
		us. The appara-	for Single Crystals Substances. Purity		
	nsisted of a man		per cent.	JJ.J/ Weight	
cell di	mpensator, and vided by a mero	a solubility curv seal. A			
	essure of 200 m				
tempera	ture were estal	olished. The			
	nds of the ampoints dissolved as	ale were pierced.	ESTIMATED ERROR: $\delta T/K = 0.05$		
flowed	through a serie	es of small cups.	$\delta P/mmHg = 0.01$		
The amo	ount of gas dis	solved was deter-	$\delta x_1 / x_1 = 0.00$	5	
	by the rise in m Mpensator.	mercury level in	DEDEDENOVC		
Some	e measurements w	were made at 400	REFERENCES:		
mmHg ga	as pressure. Th	he results con-			
Tirmed	that Henry's la	aw was obeyed.			
	le fraction solution kPa (760 mmHg	ubility at) was calculated			
	ry's law by the				
		<u> </u>	1		

COMPONENTS :		OBTOTNAL WEACH			
	00.0	ORIGINAL MEASUREMENTS:			
1. Krypton; Kr; 7439	- 20- 2	Nomarenko, V	Komarenko, V.G.; Manzhelii, V.G.		
2. 1-Butanol; $C_4H_{10}O$; 71-36-3				
		Ukr. Fiz. Zh. (Ukr. Phys. J	<u>Ukr.Ed</u> .) 1968, 1968, <u>13</u> , 27	<u>13</u> ,387-391. 3-276.	
VARIABLES:	······································	PREPARED BY:			
T/K: 184.15 P/kPa: 26.664		- т	.D. Kittredge		
17814. 20.004	(200 hamig)		L.Clever		
EXPERIMENTAL VALUES:					
	T/K Mol Fra	tion Mol Fra	Iction		
1	P/mmHg	200 P/mmHg			
	X ₁ ×	$x_1 x_1 x_2$	103		
	184.15 3.2	12.	5		
	193.15 2.6	3 10.	2	1	
	203.15 2.1 213.15 1.8		. 28		
	223.15 1.5	22 5.	784		
l	233.15 1.2		921		
	243.15 1.1		290		
±	= -8.98016 + 8.3				
T/K Mol Fraction	ΔG ^O /kJmol ⁻¹ ΔH	$^{\prime}$ kJmol ⁻¹ Δs^{c}	$JK^{-1}mol^{-1}$ ΔCl	o ^o /JK ⁻¹ mol ⁻¹	
$x_1 \times 10^3$					
183.15 12.8	6.633	•6.794	-73.32	0.839	
193.15 10.2	7.367		-73.27	n	
203.15 8.27		-6.778	-73.23	17 14	
213.15 6.85 223.15 5.77		-6.769 -6.761	-73.19 -73.15		
233.15 4.939			-73.12	11	
243.15 4.281		-6.744	-73.08		
The mole fraction by Henry's law by the	n solubility at compiler.	.01.325 kPa (7	60 mmHg) was ca	alculated .	
	AUXILIAR	INFORMATION			
METHOL /APPARATUS /PROC	EDURE:	SOURCE AND PUE	RITY OF MATERIALS:		
The solvent was do				ziven.	
A thin layer of alcol 125-175 K, was kept	hol, cooled to	Purity	by chromatograp 89 per cent.		
vacuum maintained at	10^{-3} mmHg.	2. l-Butan	ol. Purified a	and analyzed	
The degassed liqu	id was sealed		All-Union Sci.	-	
under vacuum in an an an placed in the appara		for Sin	gle Crystals &	High-Purity	
tus consisted of a ma		Substan per cen	nces. Purity 99	9.97 weight	
cury compensator, and		per cen			
gas pressure of 200 m					
temperature were esta	ablished. The	FOTIMATED PDD	<u></u>		
foil ends of the amp	· · · · · · · · · · · · · · · · · · ·	ESTIMATED ERRO			
The gas dissolved as flowed through a ser			$\delta T/K = 0.05$ $\delta P/mmHg = 0.01$		
The amount of gas di	ssolved was		$\delta X_1 / X_1 = 0.003$	5	
determined by the rus		DUDDDDDD			
level in the compensation Some measurements		REFERENCES:			
mmHg gas pressure.	The results con-				
firmed that Henry's	law was obeyed.				
1					
L		1			

COMPONENTS:	ORIGINAL MEASUREMENTS:			
1. Krypton; Kr; 7439-90-9	Battino, R.; Evans, F. D.;			
	Danforth, W. F.; Wilhelm, E.			
2. 2-Methyl-1-propanol; C ₄ H ₁₀ O; 78-83-1				
	J. Chem. Thermodyn. 1971, 3, 743-751.			
VARIABLES:	PREPARED BY:			
T/K: 282.93 - 308.44 P/kPa: 101.325 (1 atm)	H. L. Clever			
EXPERIMENTAL VALUES:				
T/K Mol Fraction	Bunsen Ostwald			
$x_1 \times 10^3$	Coefficient Coefficient			
282.93 2.90	0.711 0.737			
297.89 2.57	0.622 0.678			
308.44 2.34	0.559 0.632			
$\Delta H^{\circ}/J \text{ mol}^{-1} = -6078$ $T/K \text{ Mol Frace}$	0, Coef. Corr. = 0.9999 .0, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -70.039$.0, $\Delta G^{\circ}/J mol^{-1}$			
X ₁ x 3				
278.15 3.04 283.15 2.90				
283.15 2.90 288.15 2.78				
293.15 2.66 298.15 2.55	•			
303.15 2.45	15,154			
308.15 2.35 313.15 2.27				
The solubility values were adjusted	to a partial pressure of krypton of			
101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula	ated by the compiler.			
	INFORMATION			
ME THOD:				
A. Degasser (1). B. Absorption	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Air Products & Chemi-			
of gas in a thin film of liquid (2,3)	cals. Research grade. Greater than 99 mol %.			
APPARATUS/PROCEDURE:	2. 2-Methyl-l-propanol. Fisher Scientific Co. Certified (99 mol %).			
Degassing. The solvent is sprayed into an evacuated chamber of an all glass apparatus; it is stirred and heated until the pressure drops to the vapor pressure of the liquid.	a			
Solubility Determination. The de gassed liquid passes in a thin film	ESTIMATED ERROR:			
down a glass spiral tube at a total	$\delta T/K = 0.03$			
pressure of one atm of solute gas plus solvent vapor. The gas absor-	$\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.015$			
bed is measured in the attached	REFERENCES:			
buret system, and the solvent is collected in a tared flask and weighed.	 Andress Battino, R.; Evans, F.D. Anal. Chem. 1966, 38, 1627. Morrison, T. J.; Billet, F. J. Chem. Soc. 1948, 2033. Clever, H. L.; Battino, R.; Saylor, J. H.; Gross, P. M. J. Phys. Chem. 1957, 61, 1078. 			

COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	van Liempt, J. A. M.; van Wijk, W.		
<pre>2. 1-Pentanol (Amyl Alcohol); C₅H₁₂O; 71-41-0</pre>	Rec. <u>Trav.</u> Chim. Pays- <u>Bas</u> 1937, <u>56</u>		
	632-634.		
VARIABLES:	PREPARED BY:		
T/K: 296.15 P/kPa: 101.325 (1 atm)	H. L. Clever		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald		
$X_1 \times 10^3$	Coefficient Coefficient		
296.15 3.18	0.66 0.72		
The Ostwald coefficient was calculat	ed by the compiler		
	······································		
AUXILIARY	INFORMATION		
METHOD:	SOURCE AND PURITY OF MATERIALS:		
The apparatus appears to be simi- lar to the Winkler type apparatus	1. Krypton. Source not given. Contained 5 % xenon.		
used by Körösy (1).	2. Amyl Alcohol. No information.		
	2. Amyr Alcohol. No information.		
	ESTIMATED ERROR:		
APPARATUS/PROCEDURE:	$\delta x_1 / x_1 = 0.10$ (Compiler)		
[
	REFERENCES:		
	REFERENCES:		
	REFERENCES:		
	REFERENCES:		

1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS:		
2. 1-Octanol; C ₈ H ₁₈ O; 111-87-5	Wilcock, R. J.; Battino, R.; Danforth, W. F.; Wilhelm, E.		
	J. Chem. Thermodyn. 1978, 10, 817 -		
	822.		
VARIABLES:	PREPARED BY:		
T/K: 298.06 P/kPa: 101.325 (1 atm)	A.L. Cramer		
EXPERIMENTAL VALUES:	L e anno 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 1977 - 197		
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient		
$x_1 \times 10^3$			
298.06 3.773	0.5349 0.5837		
A preliminary account of this work app (C.R.) 4th 1975, <u>6</u> , 122-128.	peared in <u>Conf. Int. Thermodyn</u> . Chim.		
The solubility value was adjusted to a kPa (l atm) by Henry's law.	krypton partial pressure of 101.325		
The Bunsen coefficient was calculated	by the compiler		
AUXILIARY	INFORMATION		
······	INFORMATION SOURCE AND PURITY OF MATERIALS:		
METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Billett (1) and the version used is described			
METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Billett	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. The Matheson Co., Inc., or Air Products and Chemicals. Purest commercially available. 2. 1-Octanol. Eastman Organic Chemicals. Distilled until refractive index equals the value recommended by Wilhoit, R.C.; Zwolinski, B. J. J. Phys. Chem. 		
METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus is that de- scribed by Battino, Banzhof, Bogan, and Wilhelm (3). See Krypton + Octane data sheet	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. The Matheson Co., Inc., or Air Products and Chemicals. Purest commercially available. 2. 1-Octanol. Eastman Organic Chemicals. Distilled until refractive index equals the value recommended by Wilhoit, R.C.; Zwolinski,B. J. J. Phys. Chem. Ref. Data 1973, 2 (Suppl. No. 1), 		

······································			
COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	<pre>Wilcock, R. J.; Battino, R.; Danforth, W. F.; Wilhelm, E. <u>J. Chem. Thermodyn</u>. 1978, <u>10</u>, 817 - 822.</pre>		
2. 1-Decanol; C ₁₀ H ₂₂ O; 112-30-1			
VARIABLES:	PREPARED BY:		
T/K: 298.06 P/kPa: 101.325 (1 atm)	A.L. Cramer		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient		
$x_{1} \times 10^{3}$			
298.06 4.250	0.4984 0.5439		
	0		
A preliminary account of this work app (C.R.) 4th 1975, <u>6</u> , 122-128.	peared in <u>Conf</u> . <u>Int</u> . <u>Thermodyn</u> . <u>Chim</u> .		
The solubility value was adjusted to a kPa by Henry's law.	krypton partial pressure of 101.325		
The Bunsen coefficient was calculated	by the compiler		
	-, the complicit		
AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS;		
The solubility apparatus is based on the design of Morrison and Billett (1) and the version used is described by Battino, Evans, and Danforth (2).	 Krypton. The Matheson Co., Inc., or Air Products and Chemicals. Purest commercially available. 		
The degassing apparatus is that de- scribed by Battino, Banzhof, Bogan,	2. l-Decanol. Eastman Organic Chemicals. Distilled until		
and Wilhelm (3).	refractive index value equals the		
See Krypton + Octane data sheet for more detail.	value recommended by Wilhoit, R.C. Zwolinski, B. J. <u>J</u> . <u>Phys</u> . <u>Chem</u> .		
	Ref. Data 1973, 2 (Suppl. No. 1), 1-212 and 1-278.		
	ESTIMATED ERROR:		
	$\delta T/K = 0.03$ $\delta P/mmHq = 0.5$		
	$\delta x_1 / x_1 = 0.005$		
	REFERENCES :		
	1.Morrison, T.J.; Billett, F.		
	J. Chem. Soc. 1948, 2033. 2.Battino, R.; Evans, F.D.; Danforth, W.F.		
	J.Am.Oil Chem.Soc. 1968, 45, 830.		
	3.Battino, R.; Banzhof, M.; Bogan, M.;		
	Anal. Chem. 1971, 43, 806.		

COMPONENTS:			<u></u>	ORIGINAL MEASUREMENTS:		
1. K	. Krypton; Kr; 7439-90-9			Körösy, F.		
2. 1	1,2,3-Propanetriol (Glycerol);					
C	3 ^H 8 ^O 3; 56	-81-5		Trans. Fara	<u>aday Soc</u> . 1937, <u>33</u> , 416-42	
				·		
VARIAE		293.15		PREPARED BY:		
		101.325	(l atm)		H.L. Clever	
		- <u></u>			······	
EXPERI	MENTAL VALU	ES:				
		T/K	Mol Fraction	Bunsen	Ostwald Coefficient	
			$x_{1} \times 10^{3}$	a	L	
			<u>1 * 10</u>			
		293.15	0.2	0.06	0.06	
			<u></u>	,		
van I	liempt and	van Wijk	(2) report a B	Bunsen coeffi	cient of 0.01 for this	
syste	em at 295.	15 K and	101.325 kPa. H	Both the Körö	isy and the van Liempt	
	an wijk s ficance.	olubility	values appear	to be of 11t	tle more than qualitative	
,						
			AUXILIARY	INFORMATION		
METHO	D:		AUXILIARY		RITY OF MATERIALS:	
Tł	ne apparat		thod of Winkler	SOURCE AND PU	n. Source not given. The	
Th (1) v	ne apparat vere used.	However	thod of Winkles, the apparatus	SOURCE AND PU r 1. Kryptor gas cor	n. Source not given. The ntained 5% xenon and 1%	
Tł (1) v was u gassi	ne apparat vere used. Isually no ing was by	However t thermos evacuati	thod of Winkles , the apparatus tated, and de- ng and shaking	SOURCE AND PU r 1. Krypton gas cor non-ine	n. Source not given. The	
Th (1) w was u gassi the s	ne apparat vere used. usually no ing was by solvent, n	However t thermos evacuati ot by eva	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1%	
Th (1) v was u gassi the s boili	ne apparat vere used. usually no ing was by solvent, n ing the so	However t thermos evacuati ot by eva	thod of Winkles , the apparatus tated, and de- ng and shaking	SOURCE AND PU r 1. Krypton gas cor non-ine	n. Source not given. The ntained 5% xenon and 1% ert gases.	
Th (1) v was u gassi the s boili	ne apparat vere used. usually no ing was by solvent, n ing the so	However t thermos evacuati ot by eva	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1% ert gases.	
Th (1) v was u gassi the s boili	ne apparat vere used. usually no ing was by solvent, n ing the so	However t thermos evacuati ot by eva	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1% ert gases.	
Th (1) v was u gassi the s boili	ne apparat vere used. usually no ing was by solvent, n ing the so	However t thermos evacuati ot by eva	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1% ert gases.	
Th (1) w was u gassi the s	ne apparat vere used. usually no ing was by solvent, n ing the so	However t thermos evacuati ot by eva	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1% ert gases.	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Kryptor gas cor non-ine 2. 1,2,3-F	n. Source not given. The ntained 5% xenon and 1% ert gases. Propantriol. No informa-	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. usually no ing was by solvent, n ing the so	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion.	n. Source not given. The ntained 5% xenon and 1% ert gases. Propantriol. No informa-	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion.	n. Source not given. The ntained 5% xenon and 1% ert gases. Propantriol. No informa-	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion.	n. Source not given. The ntained 5% xenon and 1% ert gases. Propantriol. No informa-	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion.	n. Source not given. The ntained 5% xenon and 1% ert gases. Propantriol. No informa-	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion. ESTIMATED ERR REFERENCES: 1. Winkler	h. Source not given. The htained 5% xenon and 1% ert gases. Propantriol. No informa- ROR: $\delta X_1/X_1 = 0.05$ r, L.W.	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion. ESTIMATED ERR REFERENCES: 1. Winkler	h. Source not given. The htained 5% xenon and 1% ert gases. Propantriol. No informa- ROR: δX ₁ /X ₁ = 0.05	
Th (1) v was u gassi the s boili Wink	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion. ESTIMATED ERR REFERENCES: 1. Winkler <u>Ber</u> . 18 2. van Lie	h. Source not given. The htained 5% xenon and 1% ert gases. Propantriol. No informa- ROR: $\delta X_1/X_1 = 0.05$ r, L.W. B91, <u>24</u> , 89. empt, J.A.M.; van Wijk, W.	
Th (1) v was u gassi the s boili Winkl	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion. ESTIMATED ERR REFERENCES: 1. Winkler <u>Ber</u> . 18 2. van Lie <u>Rec</u> . Tr	h. Source not given. The htained 5% xenon and 1% ert gases. Propantriol. No informa- $\delta X_1/X_1 = 0.05$ r, L.W. B91, <u>24</u> , 89. empt, J.A.M.; van Wijk, W. rav. Chim. Pays-Bas 1937,	
Th (1) v was u gassi the s boili Winkl	ne apparat vere used. isually no ing was by solvent, n ing the so ler.	However of thermos vevacuati of by eva lvent as	thod of Winkley , the apparatus tated, and de- ng and shaking cuating and	SOURCE AND PU 1. Krypton gas cor non-ine 2. 1,2,3-F tion. ESTIMATED ERR REFERENCES: 1. Winkler <u>Ber</u> . 18 2. van Lie	h. Source not given. The htained 5% xenon and 1% ert gases. Propantriol. No informa- $\delta X_1/X_1 = 0.05$ r, L.W. B91, <u>24</u> , 89. empt, J.A.M.; van Wijk, W. rav. Chim. Pays-Bas 1937,	

20170177177				
COMPONENTS :	ORIGINAL MEASUREMENTS:			
1. Krypton; Kr; 7439-90-9	Körösy, F.			
2. Cyclohexanol; C ₆ H ₁₂ O; 108-93-0				
0 12				
	<u>Trans</u> . <u>Faraday</u> <u>Soc</u> . 1937, <u>33</u> , 416-425.			
WARTARI DO				
VARIABLES: T/K: 295.15	PREPARED BY:			
P/kPa: 101.325 (1 atm)	H.L. Clever			
EXPERIMENTAL VALUES:				
T/K Mol Fraction	Bunsen Ostwald			
	Coefficient Coefficient			
$x_{1} \times 10^{3}$	a L			
295.15 1.68	0.37 0.40			
The mole fraction solubility and the B	unsen coefficient were calculated by			
the compiler. It was assumed that gas	behavior is ideal, the Ostwald			
coefficient is independent of pressure	, and that Henry's law is obeyed.			
AUXILIARY	INFORMATION			
METHOD:	SOURCE AND PURITY OF MATERIALS:			
The apparatus and method of Winkler	1. Krypton. Source not given. The			
(1) were used. However, the apparatus	gas contained 5% xenon and 1%			
was usually not thermostated, and	non-inert gases.			
degassing was by evacuating and shaking the solvent, not by evacuating	2. Cyclohexanol. No information.			
and boiling the solvent as was done	2. Cyclonexanol. No information.			
by Winkler.				
-				
	ESTIMATED ERROR:			
APPARATUS/PROCEDURE:				
	$\delta x / x = 0.05$			
	$\delta x_1 / x_1 = 0.05$			
	REFERENCES :			
	1. Winkler, L.W.			
	Ber. 1891, 24, 89.			
	l			

COMPONENTS :	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	Körösy, F.		
2. 2-Propanone (Acetone); C ₃ H ₆ O;			
67-64-1	Trans. Faraday Soc. 1937, 33,416-425.		
VARIABLES:	PREPARED BY:		
T/K: 292.15 - 293.15 P/kPa: 101.325 (1 atm)	H.L. Clever		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient		
$x_{1} \times 10^{3}$	a L		
Technical Acetone			
292.15 -	- 0.83		
Dried Acetone			
293.15 3.20	0.98 1.05		
	0.98 1.05		
AUXILIARY	INFORMATION		
METHOD: The apparatus and method of Winkler	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de-	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried tech- 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the tech- 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the tech- 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the tech- 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the technical grade. 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the technical grade. ESTIMATED ERROR: 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried technical grade. No indication of the amount of water in the technical grade. ESTIMATED ERROR: 		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried tech- nical grade. No indication of the amount of water in the tech- nical grade. ESTIMATED ERROR:</pre>		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried tech- nical grade. No indication of the amount of water in the tech- nical grade.</pre>		
METHOD: The apparatus and method of Winkler (1) were used. However, the apparatus was usually not thermostated, and de- gassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. The gas contained 5% xenon and 1% non-inert gases. 2. 2-Propanone. Source not given. Technical grade and dried tech- nical grade. No indication of the amount of water in the tech- nical grade. ESTIMATED ERROR:</pre>		

OMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	Körösy, F.		
2. Acetic Acid, Glacial; C ₂ H ₄ O ₂ ;	Trans. Faraday Soc. 1937, 33, 416-425		
64-19-7			
VARIABLES :			
T/K: 295.15	PREPARED BY:		
P/kPa: 101.325 (1 atm)	H.L. Clever		
XPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald		
3	Coefficient Coefficient		
$x_1 \times 10^3$	L		
295.15 1.11	0.44 0.47		
	ARY INFORMATION		
METHOD: The apparatus and method of Wink	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th		
METHOD: The apparatus and method of Wink (1) were used. However, the appara	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1%		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki	SOURCE AND PURITY OF MATERIALS; cler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and of gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases. ing 2. Acetic acid. Source not given.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and of gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases. ing 2. Acetic acid. Source not given.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and of gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases. ing 2. Acetic acid. Source not given.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and of gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by	SOURCE AND PURITY OF MATERIALS: tler tus de- ing 2. Acetic acid. Source not given. Glacial acetic acid.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and of gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by	SOURCE AND PURITY OF MATERIALS; tler 1. Krypton. Source not given. Th atus gas contained 5% xenon and 1% de- non-inert gases. ing 2. Acetic acid. Source not given.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by Winkler.	SOURCE AND PURITY OF MATERIALS: tler tus de- ing 2. Acetic acid. Source not given. Glacial acetic acid.		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>SOURCE AND PURITY OF MATERIALS: ler itus de- ing 2. Acetic acid. Source not given. Glacial acetic acid.</pre>		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by Winkler.	SOURCE AND PURITY OF MATERIALS: tler atus de- ing 2. Acetic acid. Source not given. Glacial acetic acid. ESTIMATED ERROR:		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>SOURCE AND PURITY OF MATERIALS: ler itus de- ing 2. Acetic acid. Source not given. Glacial acetic acid.</pre>		
METHOD: The apparatus and method of Wink (1) were used. However, the appara was usually not thermostated, and d gassing was by evacuating and shaki the solvent, not by evacuating and boiling the solvent as was done by Winkler.	SOURCE AND PURITY OF MATERIALS: 1. Krypton. Source not given. Th gas contained 5% xenon and 1% non-inert gases. 2. Acetic acid. Source not given. Glacial acetic acid. ESTIMATED ERROR: $\delta X_1/X_1 = 0.05$ REFERENCES: 1. Winkler, L. W.		

COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	Körösy, F.		
2. Esters			
	Trans. Faraday Soc. 1937, 33, 416-425.		
VARIABLES: T/K: 293.15	PREPARED BY:		
P/kPa: 101.325 (1 atm)	H.L. Clever		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald		
	Coefficient Coefficient		
$x_{1} \times 10^{3}$	α L		
Butyl Acetate; C ₆ H ₁₂ O ₂	; 123-86-4		
293.15 4.6	0.79 0.85		
Dibutyl Ester of 1,2 I (Dibutyl phthalate); C	Benzene Dicarboxylic Acid		
	16-22-4/ 01 /1 2		
293.15 5.2	0.44 0.47		
	······································		
The mole fraction solubility and the	Bunsen coefficient were calculated by		
the compiler. It was assumed that gas	s behavior is ideal, the Ostwald		
coefficient is independent of pressure	e, and that Henry's law is obeyed.		
AUXILIARY	INFORMATION		
ME THOD:	SOURCE AND PURITY OF MATERIALS:		
The apparatus and method of	1. Krypton. Source not given. The		
Winkler (1) were used. However, the	gas contained 5% xenon and 1%		
apparatus was usually not thermo-	non-inert gases.		
stated, and degassing was by evacu- ating and shaking the solvent, not by	2. Esters. Source not given.		
evacuating and boiling the solvent as	-		
was done by Winkler.	-		
	ESTIMATED ERROR:		
APPARATUS/PROCEDURE:			
	$\delta x_1 / x_1 = 0.05$		
	REFERENCES:		
	l Winklow I W		
	1. Winkler, L. W. Ber. 1891, <u>24</u> , 89.		
l l l l l l l l l l l l l l l l l l l			

COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Krypton; Kr; 7439-90-9	Clever, H.L.; Saylor, J.H.;		
	Gross, P.M.		
 Undecafluoro (trifluoromethyl) - 			
cyclohexane (Perfluoromethyl-			
cyclohexane); C ₇ F ₁₄ ; 355-02-2			
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 89-91.		
VARIABLES:			
	PREPARED BY:		
T/K: 289.15 - 316.25	P. L. Long		
Total P/kPa: 101.325 (1 atm)	P.L. Long		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Ostwald		
	Coefficient Coefficient		
$x_1 \times 10^3$	α L		
<u> </u>			
289.15 9.06	1.058 1.12		
303.15 8.08	0.925 1.027		
316.25 7.77	0.872 1.01		
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -4302.3 + 54.078 \text{ T}$		
Std. Dev. $\Delta G^{O} = 46.1$,			
$\Delta H^{O}/J \text{ mol}^{-1} = -4302.3$, $\Delta S^{O}/J \ \kappa^{-1} \ mol^{-1} = -54.078$		
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$		
x, x			
	10		
288.15 9.	02 11,280		
293.15 8.			
298.15 8.	49 11,821		
303.15 8.1	25 12,091		
	03 12,362		
313.15 7.1			
318.15 7.	61 12,903		
The solubility values were adjusted to	a a partial program of krypton of		
101.325 kPa (1 atm) by Henry's law.	o a partial pressure of krypton of		
The Bunsen coefficients were calculate	ed by the compiler.		
	•		
	INFORMATION		
	INFORMATION		
METHOD:	SOURCE AND PURITY OF MATERIALS;		
Volumetric. The apparatus (1) is a	1. Krypton. Matheson Co., Inc. Both		
modification of that used by Morrison	standard and research grades were		
and Billett (2). Modifications in-	used.		
clude the addition of a spiral			
solvent storage tubing, a manometer	2. Perfluoromethylcyclohexane.		
for constant reference pressure, and	du Pont FCS-326, shaken with con-		
an extra gas buret for highly	centrated H ₂ SO ₄ , washed, dried		
soluble gases.	over Drierite and distilled.		
	b.p. 75.95 to 76.05° at 753 mm.,		
	lit. b.p. 76.14 at 760 mm.		
	110. D.P. /0.14 de /00 hait.		
APPARATUS/PROCEDURE:	ESTIMATED ERROR:		
	$\delta T/K = 0.05$		
(a) Degassing. 700 ml of solvent is shaken and evacuated while attached	$\delta P/mmHg = 3$		
to a cold trap, until no bubbles are	$\delta x_1 / x_1 = 0.03$		
seen; solvent is then transferred			
through a 1 mm capillary tubing, re-	REFERENCES:		
leased as a fine mist into a con-	1. Clever, H.L.; Battino, R.;		
tinuously evacuated flask. (b) Sol-	Saylor, J.H.; Gross, P.M.		
vent is saturated with gas as it flows	<u>J. Phys. Chem</u> . 1957, <u>61</u> , 1078.		
through 8 mm x 180 cm of tubing at-	2 Monnigon T. T. Dillett D		
tached to a gas buret. Pressure is	2. Morrison, T.J.; Billett, F.		
maintained at 1 atm as the gas is	J. Chem. Soc. 1948, 2033;		
absorbed.	<u>ibid</u> . 1952, 3819.		

DMPONENTS:			ORIC	ORIGINAL MEASUREMENTS:			
L. Krypton; Kr; 7439-90-9				Steinberg, M.; Manowitz, B.;			
. Dichlorodifluoromethane				Pruzansky, J.			
(Freon-12); CCl ₂ F ₂ ; 75-71-8		US	US AEC BNL-542 (T-140).				
$(1201-12), 0012^{2}, 0012^{2}, 0012^{2}$				<u>Chem. Abstr. 1959, 53, 21242g.</u>			
VARIABLES:			PREI	PREPARED BY:			
T/K	: 190.15 - 2	273.15		H.L. Clever			
EXPERIMENTAL V	ALUES:						
т/к	Absorption	Henry's	Mol Fra	ction	Bunsen	Ostwald	
-/	Coefficient	Constant	X, X			Coefficient	
		K/atm	^1 ×	TO	α	L	
190.15	13.9		4.3	2	13.2	9.2	
193.15	12.6		3.7	6	11.9	8.4	
197.65	11.3		3.4		10.7	7.7 ₅	
203.15 244.15	 5.1	32.5	3.0		 4.8	4.3	
260.85	J.T 	86	1.1		4.0	4.5	
273.15	2.4	108	f 0.9	25	2.3	2.3	
			٥.٤				
Smoothed Dat	ta: ∆G ^O /J mo	$1^{-1} = - RT$	$ln X_1 =$	-7772	.6 + 67.346 I	!	
		_					
		$\wedge \Delta G^{O} = 69$					
	∆H ^O /J mc	$p1^{-1} = -7,7$	72.6, Δ	^о /ј к ⁻	$^{1} mol^{-1} = 0.9$	9997	
	-	Mol	Encetic	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\frac{1}{1}$		
	-			on ∆G ^C	/J mol ⁻¹		
	-		Fractic 1 × 10 ²	on ∆G ^C	/J mol ⁻¹		
	- - 1				/J mol ⁻¹		
	2	X	$\frac{1 \times 10^2}{3.84}$	5 5	,235.4 ,908.8		
	2 2	x .93.15 :03.15 :13.15	$ \begin{array}{r} x \ 10^2 \\ 3.84 \\ 3.02 \\ 2.44 \end{array} $	5 5 6	,235.4 ,908.8 ,582.3		
	2 2 2	X	$\frac{1 \times 10^2}{3.84}$,235.4 ,908.8 ,582.3 ,225.8		
	2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 43.15	1		,235.4 ,908.8 ,582.3 ,225.8 ,929.2 ,602.7		
	2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 43.15 53.15	$\begin{array}{r} 1 \times 10^2 \\ \hline 3.84 \\ 3.02 \\ 2.44 \\ 2.00 \\ 1.67 \\ 1.41 \\ 1.22 \end{array}$		5,235.4 908.8 582.3 ,225.8 929.2 602.7 ,276.2		
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 43.15 53.15 263.15	$\begin{array}{c} 1 \\ 1 \\ \hline \\ 3.84 \\ 3.02 \\ 2.44 \\ 2.00 \\ 1.67 \\ 1.41 \\ 1.22 \\ 1.06 \end{array}$	55 56 77 78 99	5,235.4 908.8 582.3 225.8 929.2 602.7 ,276.2 949.7		
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 43.15 53.15	$\begin{array}{r} 1 \times 10^2 \\ \hline 3.84 \\ 3.02 \\ 2.44 \\ 2.00 \\ 1.67 \\ 1.41 \\ 1.22 \end{array}$	55 56 77 78 99	5,235.4 908.8 582.3 ,225.8 929.2 602.7 ,276.2		
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 43.15 53.15 63.15 73.15	$\begin{array}{c} 1 \\ 1 \\ 3.84 \\ 3.02 \\ 2.44 \\ 2.00 \\ 1.67 \\ 1.41 \\ 1.22 \\ 1.06 \\ 0.93 \end{array}$	5 5 6 7 7 8 9 9 10	235.4 908.8 582.3 225.8 929.2 602.7 276.2 949.7 623		
METHOD/APPAT	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	X 93.15 03.15 13.15 23.15 33.15 43.15 53.15 63.15 73.15 AUXILI	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFO	5 5 6 7 7 8 9 9 9 9 10	, 235.4 , 908.8 , 582.3 , 225.8 , 929.2 , 602.7 , 276.2 , 949.7 , 623	IATERIALS:	
·	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	X 93.15 03.15 13.15 23.15 33.15 43.15 53.15 53.15 63.15 73.15 AUXILI	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFO	5 5 6 7 7 8 9 9 10 0 RMATIO	,235.4 ,908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 ,949.7 ,623	ATERIALS:	
Dynamic trac	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	X 93.15 03.15 13.15 23.15 33.15 43.15 53.15 53.15 63.15 73.15 AUXILI	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFO	5 5 6 7 7 8 9 9 10 0 RMATIO	,235.4 ,908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 ,949.7 ,623	IATERIALS:	
Dynamic trac	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	X 93.15 03.15 13.15 23.15 33.15 43.15 53.15 53.15 63.15 73.15 AUXILI	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFO SOL 1.	5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt	,235.4 ,908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 ,949.7 ,623		
Dynamic trac Henry's cons	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	X 93.15 03.15 13.15 23.15 33.15 43.15 53.15 53.15 63.15 73.15 AUXILI	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFO SOL 1.	5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt	5,235.4 908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 9,49.7 ,623		
Dynamic trac Henry's cons K = The Henry's	RATUS/PROCEDU cer technique stant is (P/atm)/X ₁ . constants ar	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 73.15 AUXILL RE: (1). The	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFC 1. 2.	5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt	5,235.4 908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 9,49.7 ,623		
Dynamic trac Henry's cons K = The Henry's	RATUS/PROCEDU cer technique stant is (P/atm)/X ₁ .	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 73.15 AUXILL RE: (1). The	1 × 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 ARY INFC 1. 2.	5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt	5,235.4 908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 9,49.7 ,623		
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a a 10 ² 1 x 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 SOL 1. 2.	5 5 6 7 7 8 9 9 10 0 RMATIO 0 RCE AN Krypt Dichl	235.4 908.8 582.3 225.8 929.2 602.7 276.2 949.7 623		
Dynamic trac Henry's cons K = The Henry's from data sn	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a a 10 ² 1 x 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 SOL 1. 2.	5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt	235.4 908.8 582.3 225.8 929.2 602.7 276.2 949.7 623		
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a a 10 ² 1 x 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 SOL 1. 2.	5 5 6 7 7 8 9 9 10 0 RMATIO 0 RCE AN Krypt Dichl	5,235.4 908.8 ,582.3 ,225.8 ,929.2 ,602.7 ,276.2 949.7 ,623 N D PURITY OF M on. orodifluorome	ethane.	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a a 10 ² 1 x 10 ² 3.84 3.02 2.44 2.00 1.67 1.41 1.22 1.06 0.93 SOL 1. 2.	5 5 6 7 7 8 9 9 10 0 RMATIO 0 RCE AN Krypt Dichl	235.4 908.8 582.3 225.8 929.2 602.7 276.2 949.7 623	93 - 0.05	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a EST	5 5 6 7 7 8 9 9 10 0 RMATIO 0 RCE AN Krypt Dichl	<pre>5,235.4 908.8 582.3 929.2 602.7 ,276.2 949.7 623 D PURITY OF M con. corodifluorome SRROR: δX/X = 0.0</pre>	ethane.	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a EST	5 5 6 7 7 8 9 9 10 0 RMATIO RCE AN Krypt Dichl	<pre>5,235.4 908.8 582.3 225.8 929.2 602.7 276.2 949.7 623 N D PURITY OF M con. corodifluorome SRROR: δX/X = 0.0</pre>	othane. 03 - 0.05 (Compiler)	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a EST	5 5 6 7 7 8 9 9 10 0 RMATIC 0 RCE AN Krypt Dichl Unchl ERENCES: Stein	<pre>5,235.4 908.8 582.3 929.2 602.7 ,276.2 949.7 623 D PURITY OF M con. corodifluorome SRROR: δX/X = 0.0</pre>	othane. 03 - 0.05 (Compiler) nowitz, B.	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a EST	5 5 6 7 7 8 9 9 10 0 RMATIC 0 RCE AN Krypt Dichl Unchl ERENCES: Stein Ind.	$\delta_{x} = 0.0$ $\delta_{x} = 0.0$ $\delta_{x} = 0.0$ $\delta_{x} = 0.0$ $\delta_{x} = 0.0$ $\delta_{x} = 0.0$ $\delta_{x} = 0.0$	othane. 03 - 0.05 (Compiler) nowitz, B.	
Dynamic trac Henry's cons K = The Henry's from data sn The report i	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	x 93.15 03.15 13.15 23.15 33.15 53.15 53.15 63.15 73.15 AUXILI RE: (1). The re probably ie authors.	a REF	5 5 6 7 7 8 9 9 10 0 0 RMATIO 0 RCE AN Krypt Dichl Dichl IMATED E Stein Ind. Stein US AE	$\delta_{x}/x = 0.0$	ethane. 03 - 0.05 (Compiler) 100witz, B. 059, <u>51</u> , 47. 1959, 217-218.	

COMPONENTS :			ORIGINAL MEA	SUREMENTS:	
l. Krypton; Kr; 7439-90-9			Körösy, F.		
2. Halogenat					
			Trans. Faraday Soc. 1937, 33, 416-425.		
				<u>aaaj</u> <u>500</u> , 1997, <u>50</u> , 110 (29)	
VARIABLES:		<u> </u>	DDEDADED DV.		
T/K:	273.15 - 2		PREPARED BY: H.L. Clever		
P/kPa:	101.325 (1	atm)			
EXPERIMENTAL VA	LUES:				
	T/K M	ol Fraction	Bunsen	Ostwald Coefficient	
		$x_1 \times 10^3$	a	L	
:	Trichloro	 methane (Chlo	roform) · CH	$c_1 \cdot 6_{7-66-3}$	
				5	
	273.15 294.15	3.4 3.35	0.97 0.938	0.97 1.01	
	Tetrachlo	romethane (Ca	rbon Tetrac	hloride);	
	CC1 ₄ ; 56-				
	273.15	5.02 5.22	1.20	1.20 1.31	
	Tribromom	ethane (Bromo	form); CHBr	3; 75-25-2	
	295.15	3.01	0.43	0.46	
		AUXILIARY	INFORMATION	· · · ·	
METHOD:		······································	SOURCE AND H	PURITY OF MATERIALS:	
The appar		hod of Winkle the apparatu	r 1. Krypt	on. Source not given. The ontained 5% xenon and 1%	
was usually	not thermost	ated, and de-	non-i:	nert gases.	
the solvent,	not by evac			nts. No information.	
boiling the Winkler.	solvent as w	as done by			
APPARATUS (PROC	POUDE .		ESTIMATED E	RROR:	
	APPARATUS/PROCEDURE:			$\delta x_1 / x_1 = 0.05$	
				1' 1	
			REFERENCES:		
				er, L.W.	
			Ber.	1891, <u>24</u> , 89.	
1					
			1		

	OBICINAL MEASUREMENTES.
COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS:
	Saylor, J.H.; Battino, R.
2. Fluorobenzene; C ₆ H ₅ F; 462-06-6	
	J. Phys. Chem. 1958, 62, 1334-1337.
VARIABLES: T/K: 288.15 - 328.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^3$	a L
$\frac{1}{288.15}$ $\frac{1}{3.47}$	0.834 0.880
298.15 3.36	0.798 0.871
313.15 3.13 328.15 2.96	0.731 0.838 0.678 0.814
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln X$	
Std. Dev. $\Delta G^{\circ} = 13.2$, Co	1 = 0.10.0 + 0.100 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 + 0.000 +
$\Delta H^{0}/J mol^{-1} = -3210 3$	$\Delta S^{O}/J K^{-1} mol^{-1} = -58.186$
	$\Delta G^{O}/J \text{ mol}^{-1}$
$X_1 \times 10^{-1}$	
$\frac{1}{288.15}$ $\frac{1}{3.49}$	
293.15 3.41	13,847
298.15 3.33 303.15 3.26	14,138
308.15 3.20	
313.15 3.13 318.15 3.07	15,011
318.15 3.07 323.15 3.02	15,302 15,593
<u>328.15</u> 2.96	15,884
Solubility values were adjusted to a pa 101.325 kPa (1 atm) by Henry's law. Bu	insen coefficients were calculated
by the compiler.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
	1. Krypton. Linde Air Products Co.
ating the space above it, shaking, and	
then passing it as a fine mist into another evacuated container. The de-	2. Fluorobenzene. Eastman Kodak Co., white label. Dried over P ₄ O ₁₀ ,
gassed liquid was saturated as it	distilled, b.p. 84.28 - 84.68°C.
passed as a thin film inside a glass helix which contained the solute gas	
plus solvent vapor at a total pres-	
sure of 1 atm (1,2). The volume of liquid and the volume of gas absorbed	
are determined in a system of burets.	
	ESTIMATED ERROR:
	$\delta T/K = 0.03$
	$\frac{\delta P/mmHg}{\delta X_1/X_1} = 0.005 \text{ (authors)}$
	REFERENCES:
	1. Morrison, T.J.; Billett, F.
	<u>J. Chem. Soc</u> . 1948, 2033.
	<u>J. Chem</u> . <u>Soc</u> . 1948, 2033. 2. Clever, H.L.; Battino, R.;

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Evans, F. D.; Battino, R.
	,,,,
<pre>2. Hexafluorobenzene; C₆F₆; 392-56-3</pre>	
392-30-3	J. Chem. Thermodyn. 1971, 3, 753-760.
VARIABLES:	PREPARED BY:
T/K: 282.91 - 297.92 P/kPa: 101.325 (l atm)	H. L. Clever
F/RFd. 101.525 (1 dtm)	
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^3$	a L
	1.286 1.332
282.91 6.45 283.09 6.42	1.279 1.326
297.76 5.92	1.155 1.259
297.92 5.89	1.148 1.252
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT 1$	$n X_1 = -4,063.6 + 56.302 T$
Std. Dev. $\Delta G^\circ = 4.9$.	Coef. Corr. = 0.9999
$\Delta H^{\circ}/J \text{ mol}^{-1} = -4063.$	6, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -56.302$
T/K Mol Frac	tion AG°/J mol ⁻¹
x ₁ x 1	03
278.15 6.64	
283.15 6.44	11 070
288.15 6.25	12,160
	12,160 12,441
288.15 6.25 293.15 6.07 298.15 5.90	12,160 12,441 12,723
288.15 6.25 293.15 6.07	12,160 12,441 12,723
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law.	12,160 12,441 12,723 to a partial pressure of krypton of
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted	12,160 12,441 12,723 to a partial pressure of krypton of
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula	12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler.
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY	12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE:	12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS;
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil-	12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals or Matheson. Better
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil- lett (1) and the version used is	12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products &
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil- lett (1) and the version used is described by Battino, Evans, and	<pre>12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals or Matheson. Better than 99 mol % (usually 99.9+) 2. Hexafluorobenzene. Imperial</pre>
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil- lett (1) and the version used is described by Battino, Evans, and Danforth (2). The degassing appara- tus is that described by Battino,	<pre>12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals or Matheson. Better than 99 mol % (usually 99.9+) 2. Hexafluorobenzene. Imperial Smelting Co., Avonmouth, U.K.</pre>
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil- lett (1) and the version used is described by Battino, Evans, and Danforth (2). The degassing appara- tus is that described by Battino, Banzhof, Bogan, and Wilhelm (3).	<pre>12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals or Matheson. Better than 99 mol % (usually 99.9+) 2. Hexafluorobenzene. Imperial Smelting Co., Avonmouth, U.K. GC purity 99.7%, density at 25° C</pre>
288.15 6.25 293.15 6.07 298.15 5.90 The solubility values were adjusted 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcula AUXILIARY METHOD /APPARATUS/PROCEDURE: The solubility apparatus is based on the design of Morrison and Bil- lett (1) and the version used is described by Battino, Evans, and Danforth (2). The degassing appara- tus is that described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such	<pre>12,160 12,441 12,723 to a partial pressure of krypton of ted by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Krypton. Either Air Products & Chemicals or Matheson. Better than 99 mol % (usually 99.9+) 2. Hexafluorobenzene. Imperial Smelting Co., Avonmouth, U.K.</pre>
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$\frac{(2470-2813)}{1. \ KryPton; Kr; 7439-90-9}$ 2. Chlorobenzene; C ₆ H ₃ Cl; 109-90-7 2. Chlorobenzene; C ₆ H ₃ Cl; 109-90-7 3. Chromoson (1990) EXPERIMENTAL VALUES: T/K Mol Fraction (2667) EXPERIMENTAL VALUES: EXPERIMENTAL VALUES: T/K Mol Fraction (2667) Bunson (2684) Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient		
2. Chlorobenzene; $C_{6}H_{5}C1$; 108-90-7 2. Chlorobenzene; $C_{6}H_{5}C1$; 108-90-7 J. Phys. Chem. 1958, 62, 1334-1337. UARIABLES: T/K 288.15 - 328.15 P/KPA: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Mol Fraction Dumsen Ostwald Coefficient Coefficient $\frac{x_1 \times 10^3}{288.15} \frac{a}{2.84}$ 0.629 $\frac{1}{0.629} \frac{b}{0.664}$ 0.653 $\frac{1}{0.631} \frac{b}{0.631}$ 0.623 $\frac{1}{0.631} \frac{b}{0.631}$ 0.623 $\frac{1}{0.631} \frac{b}{0.631}$ 0.623 $\frac{1}{0.631} \frac{b}{0.631}$ 0.623 $\frac{1}{0.631} \frac{b}{0.631}$ 0.623 $\frac{1}{0.632} \frac{b}{0.631}$ 0.623 $\frac{1}{0.631} \frac{b}{0.631}$ 0.625 $\frac{1}{0.631} \frac{b}{0.731}$ 0.737 $\frac{1}{0.631} \frac{b}{0.731}$ 0.737 $\frac{1}{0.631} \frac{b}{0.731}$ 0.737 $\frac{b}{0.631} \frac{b}{0.731}$ 0.737 $\frac{b}{0.631} \frac{b}{0.731}$ 0.737 $\frac{b}{0.631} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$ 0.035 $\frac{b}{0.731} \frac{b}{0.731}$	COMPONENTS:	ORIGINAL MEASUREMENTS:
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	1. Krypton; Kr; /439-90-9	Saytor, U.M., Battino, K.
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	2. Chlorobenzene; C ₆ H ₅ Cl; 108-90-7	
VARIABLES: T/K: 288.15 - 328.15 P/KPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K MOI Fraction $\frac{x_1 \times 10^3}{288.15} - \frac{a}{2.64}$ $\frac{x_1 \times 10^3}{0.629} - \frac{0.644}{0.659}$ $\frac{313.15}{2.85} - 2.64$ $\frac{328.15}{2.95} - 2.64$ $\frac{328.15}{2.95} - 2.64$ $\frac{328.15}{2.95} - 2.64$ $\frac{328.15}{2.264} - \frac{2.64}{0.629} - \frac{0.644}{0.659}$ $\frac{328.15}{2.264} - \frac{2.64}{0.520} - \frac{0.624}{0.622}$ Smoothed Data: $\frac{1}{26} \frac{G^{0}}{J} \text{ mol}^{-1} = -87 \ln x_1 = -3079.8 + 59.412 \text{ T}}{5 \text{ std. Dev. } \Delta G^{0} = 13.8, \text{ Coef. Corr.} = .9999}$ $\Delta H^{0}/J \text{ mol}^{-1} = -3079.9, \Delta S^{0}/J \text{ K}^{-1} \text{ mol}^{-1} = -59.412$ $\frac{x_1 \times 10^3}{228.15} - \frac{2.72}{2.72} - 14.631}$ $\frac{288.15}{2.27} - \frac{2.64}{14.040} - \frac{10}{228.15} - \frac{2.72}{2.72} - 14.631}$ $\frac{288.15}{2.27} - \frac{2.72}{14.634} - \frac{14.040}{239.15} - \frac{2.72}{2.72} - 14.631}$ $\frac{288.15}{2.27} - \frac{2.72}{14.634} - \frac{14.040}{239.15} - \frac{2.72}{338.15} - \frac{15.822}{2.48} - \frac{15.228}{15.22.3} - \frac{15.822}{313.15} - \frac{2.48}{2.48} - \frac{16.119}{16.19} - \frac{101.325 \text{ kPa} (1 atm) \text{ by Henry's law.}}$ Bunsen coefficients were calculated by the compiler. Distribution was degaased by evacu- tinto another ovacuted constaind the graph of a subsorbed were at distribution and a subsorbed were determined at a single at a singl	0.5	T Phys. Chom. 1958 62 $1334-1337$
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$\frac{1}{7/K} \text{ Mol Fraction Bunsen Ostuald Coefficient Coefficient} \\ \frac{x_1 \times 10^3}{288.15 2.75} \frac{a}{0.629} \frac{L}{0.664} \\ \frac{298.15}{298.15 2.75} 0.653 0.653 \\ \frac{1}{312.15} 2.44 0.520 0.625 \\ \frac{1}{328.15} 2.73 0.667 Corr. = .9999 \\ \frac{1}{44^{0}/J} \text{ mol}^{-1} = -3079.8, \frac{\Delta S^{0}}{J} K^{-1} \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{7/K} \text{ Mol Fraction } \Delta S^{0}/J \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{7/K} \text{ Mol Fraction } \Delta S^{0}/J \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{288.15} 2.79 144,634 \\ \frac{1}{303.15} 2.67 144,634 \\ \frac{1}{303.15} 2.57 15,222 \\ \frac{1}{313.15} 2.57 15,222 \\ \frac{1}{323.15} 2.48 16,119 \\ \frac{1}{328.15} 2.53 15,222 \\ \frac{1}{323.15} 2.48 16,416 \\ \frac{1}{50100} \text{ Jack and by Henry's law. Bunsen coefficients were calculated by the compiler. \\ \hline \text{AUXILIARY INFORMATION} \\ \hline METROD /APPARATUS/PROCEDURE: The solvent was degassed by evacutating the space above 1t, shking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gap blus solven vapor at a total pressure of 1 atm (1,2) . The volume of the liquid and the volume of a subsorbed were determined in a system of burets. \\ \hline \text{EFFRENCES: 1. Morrison, T.J., Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L., Battino, R.; Savior, J.H., Gross, P.M. \\ \hline \$		H.L. Clever, A.L. Cramer
$\frac{1}{7/K} \text{ Mol Fraction Bunsen Ostuald Coefficient Coefficient} \\ \frac{x_1 \times 10^3}{288.15 2.75} \frac{a}{0.629} \frac{L}{0.664} \\ \frac{298.15}{298.15 2.75} 0.653 0.653 \\ \frac{1}{312.15} 2.44 0.520 0.625 \\ \frac{1}{328.15} 2.73 0.667 Corr. = .9999 \\ \frac{1}{44^{0}/J} \text{ mol}^{-1} = -3079.8, \frac{\Delta S^{0}}{J} K^{-1} \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{7/K} \text{ Mol Fraction } \Delta S^{0}/J \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{7/K} \text{ Mol Fraction } \Delta S^{0}/J \text{ mol}^{-1} = -59.412 \\ \hline \frac{1}{288.15} 2.79 144,634 \\ \frac{1}{303.15} 2.67 144,634 \\ \frac{1}{303.15} 2.57 15,222 \\ \frac{1}{313.15} 2.57 15,222 \\ \frac{1}{323.15} 2.48 16,119 \\ \frac{1}{328.15} 2.53 15,222 \\ \frac{1}{323.15} 2.48 16,416 \\ \frac{1}{50100} \text{ Jack and by Henry's law. Bunsen coefficients were calculated by the compiler. \\ \hline \text{AUXILIARY INFORMATION} \\ \hline METROD /APPARATUS/PROCEDURE: The solvent was degassed by evacutating the space above 1t, shking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gap blus solven vapor at a total pressure of 1 atm (1,2) . The volume of the liquid and the volume of a subsorbed were determined in a system of burets. \\ \hline \text{EFFRENCES: 1. Morrison, T.J., Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L., Battino, R.; Savior, J.H., Gross, P.M. \\ \hline \$		
$\frac{1}{7/K} \text{ Mol Fraction Bunsen Ostuald Coefficient Coefficient } \frac{x_1 \times 10^3}{288.15} \frac{a}{2.64} \frac{L}{0.629} \frac{a}{0.664} \frac{L}{0.653} \frac{a}{0.625} \frac{L}{0.631} \frac{1}{2.86.15} \frac{2.75}{2.75} \frac{0.663}{0.632} \frac{0.664}{0.625} \frac{1}{2.81} \frac{1}{2.2.64} \frac{0.629}{0.520} \frac{0.625}{0.625} \frac{1}{2.62} \frac{1}{2.62} \frac{1}{2.64} \frac{1}{0.520} \frac{1}{0.625} \frac{1}{0.$	EXPERIMENTAL VALUES:	L _{and}
$\frac{X_1 \times 10^3}{288,15} \frac{\alpha}{2.84} \frac{L}{0.629} \frac{L}{0.664}$ $\frac{288,15}{298,15} \frac{2.75}{2.75} \frac{0.604}{0.653} \frac{0.664}{0.659}$ $\frac{1313,15}{22.86} \frac{2.56}{0.553} \frac{0.634}{0.624}$ Smoothed Data: $\frac{\Delta G^O/J \ mol^{-1} = - \ RT \ ln \ X_1 = -3079.8 + 59.412 \ T$ Std. Dev. $\Delta G^O = 13.8$, Coef. Corr. = .9999 $\Delta H^O/J \ mol^{-1} = -3079.0, \ LS^O/J \ mol^{-1} = -59.412$ $\frac{X_1 \times 10^3}{298.15} \frac{2.85}{2.75} \frac{14.040}{14.337}$ $\frac{X_1 \times 10^3}{298.15} \frac{2.85}{2.77} \frac{14.634}{4.634}$ $\frac{303.15}{2.022} \frac{2.62}{15.223}$ $\frac{13.15}{2.262} \frac{2.63}{15.223}$ $\frac{13.15}{2.2.62} \frac{15.228}{15.223}$ $\frac{313.15}{2.3.5} \frac{2.62}{2.63} \frac{15.228}{15.223}$ $\frac{13.15}{2.2.63} \frac{15.46}{15.46}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 \ KP \ (1 \ atm) \ by \ Henry's \ law. Bunsen coefficients \ were calculated by the compiler. $\frac{40100}{APPARATUS/PROCEDURE:}$ The solvent was degassed by evacu- ating the space above 1.4, shaking, and then passing it as a fine mist into another evacuated container. The degased liquid was aturated as glass helix which contained the solute gas plus solvent vapor at a total pressure of the 11quid and the volume of gas absorbed were determined in a system of burets. $\frac{67/K = 0.03}{67/mmHg = 1.0}$ $\frac{67/K = 0.03}{67/mHg = 0.005}$ $\frac{67/K = 0.03}{67$	T/K Mol Fraction	
$\frac{288.15}{298.15} = \frac{2.84}{2.75} = 0.629 = 0.664} = 0.653$ $\frac{288.15}{313.15} = 2.56 = 0.553 = 0.634$ $\frac{288.15}{22.81} = 2.44 = 0.520 = 0.625$ Smoothed Data: $\frac{\Delta G^{O}/J \ mol^{-1} = -RT \ ln \ X_1 = -3079.8 + 59.412 \ T$ Std. Dev. $\Delta G^{O} = 13.6, \ Coef. \ Corr. = .9999$ $\Delta H^{O}/J \ mol^{-1} = -3079.8, \ \Delta S^{O}/J \ mol^{-1} = -59.412$ $\frac{1}{7/K} \ Mol \ Fraction \ \Delta G^{O}/J \ mol^{-1} = -59.412$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.75 = 14.437$ $\frac{X_1 \ X \ 10^3}{298.15} = 2.62 = 15.228$ $\frac{X_1 \ X \ 10^3}{303.15} = 2.62 = 15.228$ $\frac{X_1 \ X \ 10^3}{313.15} = 2.67 = 14.6419$ Solubility values were adjusted to a partial pressure of krypton of 101.325 \ KP \ (1 \ atm) \ by \ Henry's \ 1aw. Bunsen \ coefficients \ were \ calculated by the compiler. $\frac{AUXILLARY \ INFORMATION}{APPARATUS/PROCEDURE: The solvent was degassed by evacu- ating the space above at, shaking, and then passing it as a fine mist into another evacuated container. The degassed ling wide soluted as a thin film inside a glass helix which contained the solute gas plus solvend vapor at a colute gas plus solvend vapor at a colute gas plus solvend vapor at a system of bureds. \frac{\delta T/K = 0.03}{\delta P/mmHg = 1.0} \frac{\delta T/K = 0.005}{\delta P/mHg = 1.0} \delta T$		Coefficient Coefficient
$\frac{298.15}{328.15} 2.75 0.604 0.653 0.634 0.634 0.625 0.625 0.653 0.634 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625 0.625$	$X_1 \times 10^3$	α L
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$\frac{328.15}{46^{\circ}/3 \text{ mol}^{-1}} = . \text{ RT In } X_1 = .3079.8 + 59.412 \text{ T}}{\text{Std. Dev. } 46^{\circ} = 13.8, \text{ Coef. Corr. } = .9999}$ $\frac{4H^{\circ}/3 \text{ mol}^{-1} = .3079.8, \frac{45^{\circ}/3 \text{ K}^{-1} \text{ mol}^{-1} = .59.412 \text{ T}}{\text{Std. Dev. } 46^{\circ} = 13.8, \text{ Coef. Corr. } = .9999}$ $\frac{4H^{\circ}/3 \text{ mol}^{-1} = .3079.8, \frac{45^{\circ}/3 \text{ K}^{-1} \text{ mol}^{-1} = .59.412 \text{ T}}{(\text{K Mol Fraction } 46^{\circ}/3 \text{ mol}^{-1} = .59.412 \text{ T}/K}$ $\frac{X_1 \times 10^3}{288.15} = 2.73 \text{ Id}, 337}{298.15} = 2.73 \text{ Id}, 634}$ $\frac{303.15}{303.15} = 2.62 \text{ If}, 228}{313.15} = 2.62 \text{ If}, 228}$ $\frac{313.15}{316.15} = 2.62 \text{ If}, 228}{313.15} = 2.48 \text{ If}, 419}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\frac{\text{AUXILLARY INFORMATION}}{\text{METHOD /APPARATUS/PROCEDURE:}$ The solvent was degassed by evacuating the space above 1r, shaking, and then passing it as a fine mist into another evacuated container. The degased liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of the liquid and the volume of a subsorbed were determined in a system of burets. $REFERENCES:$ RE		
Smoothed Data: $\Delta G^{O}/J \mod^{-1} = -RT \ln x_1 = -3079.8 + 59.412 T$ Std. Dev. $\Delta G^{O} = 13.8$, Coef. Corr. = .9999 $\Delta H^{O}/J \mod^{-1} = -3079.8$, $\Delta S^{O}/J \ x^{-1} \mod^{-1} = -59.412$ T/K Mol Fraction $\Delta G^{O}/J \mod^{-1}$ $x_1 \times 10^3$ 288.15 2.95 14.040 293.15 2.73 14.634 303.15 2.67 14.931 308.15 2.62 15.228 313.15 2.57 15.525 316.15 2.53 15.822 323.15 2.44 16.416 Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's Jaw. Bunsen coefficients were calculated by the compiler. METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacu- ting the space above it, shaking, and then passing it as a fine mist into another evacuated contained. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1/2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
Std. Dev. $\Delta G^{\circ} = 13.8$, Coef. Corr. = .9999 $\Delta H^{\circ}/J \mod^{-1} = -3079.8$, $\Delta S^{\circ}/J \ltimes^{-1} \mod^{-1} = -59.412$ T/K Mol Fraction $\Delta G^{\circ}/J \mod^{-1}$ $\frac{x_1 \times 10^3}{288.15}$ 2.85 14,040 293.15 2.73 14,634 303.15 2.67 14,337 298.15 2.67 14,337 298.15 2.62 313.15 2.67 14,931 308.15 2.62 323.15 2.64 16,119 328.15 2.44 16,416 Solubility values were adjusted to a partial pressure of krypton of $101.325 \ kPa$ (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacu- ating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\ell T/K = 0.03$ $\ell T/K = 0.005$ (authors) REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
Std. Dev. $\Delta G^{\circ} = 13.8$, Coef. Corr. = .9999 $\Delta H^{\circ}/J \mod^{-1} = -3079.8, \Delta S^{\circ}/J \ltimes^{-1} \mod^{-1} = -59.412$ $\hline T/K Mol Fraction \Delta G^{\circ}/J \mod^{-1} = -59.412$ $\hline T/K Mol Fraction \Delta G^{\circ}/J \mod^{-1}$ $\hline \chi_1 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_2 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_2 \times 10^3$ $\hline \chi_1 \times 10^3$ $\hline \chi_2 \times$	Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -3079.8 + 59.412 \text{ T}$
$\Delta H^{O}/J \mod^{-1} = -3079.8, \ \Delta S^{O}/J \ \kappa^{-1} \mod^{-1} = -59.412$ $\overline{T/K} Mol \ Fraction \ \Delta G^{O}/J \ mol^{-1}$ $\frac{x_1 \times 10^3}{268.15 2.85 14,040}$ $293.15 2.79 14,337$ $298.15 2.73 14,634$ $303.15 2.62 15,228$ $313.15 2.62 15,228$ $313.15 2.62 15,228$ $313.15 2.64 16,416$ Solubility values were adjusted to a partial pressure of krypton of 101,325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $MUTHAPY INFORMATION$ METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as file solvent evacuated container. The degassed liquid was saturated as foot the liquid and the volume of a system of burets. $ESTIMATED ERROR:$ $ESTIMATED ERROR: \frac{\delta T/K = 0.03}{\delta T_1/X_1} = 0.005 (authors)$ $REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1949, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.$	Std. Dev. $\Delta G^{\circ} = 13.8$,	Coef. Corr. = .9999
$\frac{1}{T/K} \text{ Mol Fraction } \Delta G^{O}/J \text{ mol}^{-1}$ $\frac{X_1 \times 10^3}{288.15} 2.85 14,040$ $293.15 2.79 14,337$ $298.15 2.73 14,634$ $303.15 2.67 14,931$ $308.15 2.62 15,228$ $313.15 2.57 15,525$ $318.15 2.53 15,822$ $323.15 2.44 16,416$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\frac{AUXILIARY \text{ INFORMATION}}{\text{METHOD /APPARATUS/PROCEDURE:}}$ The solvent was degassed by evacuating the space above 1t, shaking. and then passing it as a fine mist into another evacuated container. The degased liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. $\frac{1}{REFERENCES:}$ $\frac{1}{Norrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033.}{2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.}$	$AH^{O}/T mol^{-1} = -3079 \Omega$	$AS^{0}/J K^{-1} mol^{-1} = -59.412$
$\frac{x_1 \times 10^3}{288.15 2.85 14,040}$ $\frac{288.15 2.79 14,337}{298.15 2.79 14,337}$ $\frac{298.15 2.79 14,634}{303.15 2.67 14,931}$ $\frac{308.15 2.62 15,228}{313.15 2.57 15,525}$ $\frac{318.15 2.53 15,822}{322.32}$ $\frac{322.15 2.44 16,416}{328.15 2.44 16,416}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacu- ating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: <i>ESTIMATED ERROR:</i> <i>ESTIMATED ERROR:</i> <i>ESTIMATED ERROR:</i> <i>Solute Soc.</i> 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
$\frac{288.15}{2.93.15} = \frac{2.85}{2.79} = \frac{14,040}{1,337}$ $\frac{298.15}{2.99.15} = \frac{2.73}{2.73} = \frac{14,634}{4,634}$ $\frac{303.15}{308.15} = \frac{2.62}{2.62} = \frac{15,228}{313.15} = \frac{2.62}{2.62} = \frac{15,228}{313.15} = \frac{2.62}{2.62} = \frac{15,228}{323.15} = \frac{2.48}{2.48} = \frac{16,119}{328.15} = \frac{2.48}{2.44} = \frac{16,119}{328.15} = \frac{2.48}{2.44} = \frac{16,416}{16,416}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION $\frac{\text{METHOD /APPARATUS/PROCEDURE:}}{\text{The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist in onother evacuated container. The degassed liquid was saturated as glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. $ $\frac{\text{ESTIMATED ERROR:}}{\text{Solvert K}} = 0.03 \text{ SoP/mmHg} = 1.0 \text{ So}_{1}/X_1 = 0.005 \text{ (authors)}}$ $\frac{\text{REFERENCES:}}{1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033.} 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.$	T/K Mol Fra	action $\Delta G^{\prime}/J$ mol ⁺
$\frac{288.15}{2.93.15} = \frac{2.85}{2.79} = \frac{14,040}{1,337}$ $\frac{298.15}{2.99.15} = \frac{2.73}{2.73} = \frac{14,634}{303.15}$ $\frac{208.15}{2.62} = \frac{2.73}{14,931}$ $\frac{308.15}{308.15} = \frac{2.62}{2.62} = \frac{15,228}{313.15}$ $\frac{313.15}{2.2.62} = \frac{15,525}{316.15}$ $\frac{328.15}{2.248} = \frac{16,119}{328.15}$ $\frac{328.15}{2.44} = \frac{16,416}{16,416}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\frac{AUXILIARY INFORMATION}{METHOD / APPARATUS/PROCEDURE:}$ The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist in on other evacuated container. The degassed liquid was saturated as glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. $ESTIMATED ERROR:$ $\frac{67/K = 0.03}{6P/mmHg = 1.0}$ $\frac{67/K_1 = 0.005 (authors)}{6X_1/X_1 = 0.005 (authors)}$ $1000000000000000000000000000000000000$	X, X	10'
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	······································	
$\begin{array}{c} 298.15 & 2.73 & 14,634 \\ 303.15 & 2.67 & 14,931 \\ 308.15 & 2.62 & 15,228 \\ 313.15 & 2.57 & 15,525 \\ 318.15 & 2.53 & 15,822 \\ 323.15 & 2.48 & 16,119 \\ 328.15 & 2.44 & 16,416 \\ \end{array}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\begin{array}{c} \text{AUXILIARY INFORMATION} \\ \end{array}$ METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. \\ \end{array} $\begin{array}{c} \text{ESTIMATED ERROR:} \\ \text{OT (K = 0.03 \\ SP/mmHg = 1.0 \\ \delta X_1/X_1 = 0.005 (authors) \\ \text{EFFERENCES:} \\ 1. Morrison, T.J.; Billett, F. \\ \underline{J}. Chem. Soc. 1948, 2033. \\ 2. Clever, H.L.; Battino, R.; \\ Saylor, J.H.; Gross, P.M. \\ \end{array}$	280.15 2.	79 14,337
$\begin{array}{c} 308.15 & 2.62 & 15,528 \\ 313.15 & 2.57 & 15,525 \\ 318.15 & 2.53 & 15,822 \\ 323.15 & 2.48 & 16,119 \\ 328.15 & 2.44 & 16,416 \\ \end{array}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION $\begin{array}{c} \text{METHOD / APPARATUS/PROCEDURE:} \\ \text{The solvent was degassed by evacuating the space above 1t, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. \\ \end{array}$ $\begin{array}{c} \text{ESTIMATED ERROR:} \\ \delta T/K = 0.03 \\ \delta P/\text{mmHg} = 1.0 \\ \delta X_1/X_1 = 0.005 \text{ (authors)} \end{array}$ $\begin{array}{c} \text{REFERENCES:} \\ 1. & \text{Morrison, T.J.; Billett, F.} \\ \underline{J. Chem. Soc. 1948, 2033.} \\ 2. & \text{Clever, H.L.; Battino, R.;} \\ \text{Saylor, J.H.; Gross, P.M.} \end{array}$	298.15 2.	73 14,634
$\begin{array}{c} 13.15 & 2.57 & 15,525 \\ 318.15 & 2.33 & 15,822 \\ 323.15 & 2.48 & 16,119 \\ 328.15 & 2.48 & 16,119 \\ 328.15 & 2.48 & 16,119 \\ 328.15 & 2.48 & 16,416 \\ \end{array}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\begin{array}{c} \text{AUXILIARY INFORMATION} \\ \hline \end{array}$ METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacuating the space above 1t, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. \\ \hline ESTIMATED ERROR: \\ & \delta T/K = 0.03 \\ \delta P/mmHg = 1.0 \\ \delta X_1/X_1 = 0.005 (authors) \\ \hline \end{array}		
$\frac{318.15}{323.15} 2.53 15,822$ $\frac{323.15}{323.15} 2.44 16,119$ $\frac{328.15}{328.15} 2.44 16,416$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. $\frac{AUXILIARY \text{ INFORMATION}}{METHOD / APPARATUS/PROCEDURE:}$ The solvent was degassed by evacuating the space above 1t, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. $ESTIMATED ERROR:$ $ESTIMATED ERROR:$ $\frac{\delta T/K = 0.03}{\delta P/mmHig = 1.0} \delta x_1/x_1 = 0.005 (authors)$ $REFERENCES:$ $\frac{\delta T/K = 0.03}{\delta P/mmHig = 1.0} \delta x_1/x_1 = 0.005 (authors)$ $REFERENCES:$ $\frac{\delta T/K = 0.03}{\delta P/mmHig = 1.0} \delta x_1/x_1 = 0.005 (authors)$		
$\frac{328.15}{2.44} \frac{16,416}{101,325 \text{ kPa} (1 \text{ atm}) \text{ by Henry's law.}} Bunsen coefficients were calculated}$ Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD / APPARATUS/PROCEDURE: The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: ESTIMATED ERROR: REFERENCES: Merrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	318.15 2.	53 15,822
Solubility values were adjusted to a partial pressure of krypton of 101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacu- ating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors) REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	323.15 2.	
101.325 kPa (1 atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: The solvent was degassed by evacu- ating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors) REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
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AUXILIARY INFORMATIONMETHOD /APPARATUS/PROCEDURE:SOURCE AND PURITY OF MATERIALS:The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets.SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. 2. Chlorobenzene. Eastman Kodak Co., white label. Dried over P_4O_{10} , distilled, b.p. 131.67 - 131.71°C.ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors)REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	by the compiler.	
METHOD /APPARATUS/PROCEDURE:SOURCE AND PURITY OF MATERIALS:The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets.SOURCE AND PURITY OF MATERIALS: 1. Krypton. Linde Air Products Co. 2. Chlorobenzene. Eastman Kodak Co., white label. Dried over P_4O_{10} , distilled, b.p. 131.67 - 131.71°C.ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors)REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
 The solvent was degassed by evacuating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: The degassed by evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: The degassed by evacuated container. The degassed liquid was saturated as a fine mist in the degassed by evacuated container. The degassed liquid was saturated as the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of burets. ESTIMATED ERROR: ESTIMATED ERROR: The degassed were determined in a system of burets. ESTIMATED ERROR: The degassed were determined in a system of burets. ESTIMATED ERROR: Bestimate the solute the		
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<pre>and then passing it as a fine mist into another evacuated container. The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets.</pre> 2. Chlorobenzene. Eastman Kodak Co., white label. Dried over P ₄ O ₁₀ , distilled, b.p. 131.67 - 131.71°C. ESTIMATED ERROR:		1. Krypton. Linde Air Products Co.
The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors) REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	ating the space above it, shaking, and then passing it as a fine mist	2. Chlorobenzene. Eastman Kodak
The degassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. $ESTIMATED ERROR: \qquad \delta T/K = 0.03 \\ \delta P/mmHg = 1.0 \\ \delta X_1/X_1 = 0.005 (authors)$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	into another evacuated container.	Co., white label. Dried over
glass helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005 (authors)$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	The degassed liquid was saturated as	P ₄ O ₁₀ , distilled, b.p. 131.67 -
solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets.	it passed as a thin tilm inside a	131.71 [°] C.
total pressure of 1 atm (1,2). The volume of the liquid and the volume of gas absorbed were determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005 (authors)$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	solute gas plus solvent vapor at a	
of gas absorbed were determined in a system of burets.	total pressure of 1 atm (1,2). The	
a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors) REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	volume of the liquid and the volume	
ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005 \text{ (authors)}$ REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.	a system of burets.	
$\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005 \text{ (authors)}$ REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc.</u> 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		ESTIMATED ERROR:
$\delta X_1 / X_1 = 0.005 \text{ (authors)}$ REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem. Soc</u> . 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		$\delta T/K = 0.03$
REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		$\delta P/mmHg = 1.0$
 Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. 		$0^{1/1} = 0.005 (authors)$
 Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. 		REFERENCES :
<u>J. Chem. Soc.</u> 1948, 2033. 2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		
2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.		J. Chem. Soc. 1948. 2033.
Saylor, J.H.; Gross, P.M.		
J. Phys. Chem. 1957, 61, 1078.		
		J. Phys. Chem. 1957. 61, 1078.
1 I		

1 Karatan Kas 7420		ORIGINAL ME	ASUREMENTS :	
1. Krypton; Kr; 7439	Clever, H	. L.		
2. 1,4-Dimethylbenzer C ₈ H ₁₀ ; 106-42-3	J. Phys.	Chem. 1957, 6	<u>1</u> , 1082 - 1083.	
3. 1,4-Dichlorobenze: 106-46-7	ne; C ₆ H ₄ Cl ₂ ;			
VARIABLES: T/K: 303. P/kPa: 101. 1,4-Dichlorobenzene/	PREPARED BY	C. E. Eddel A. L. Crame		
EXPERIMENTAL VALUES:		1		
1	benzene	Fraction 1×10^3	Bunsen Coefficient a	Ostwald Coefficient L
303.15	0.170 0.310	3.81 3.56 3.32 3.10	0.687 0.652 0.566 0.583	0.762 0.724 0.628 0.647
	raction solubility ion with the mole lvent.			
krypton of l	lity values were a 01.325 kPa (l atm) coefficients were	by Henry'	s law.	
	AUXILIARY	INFORMATION		
METHOD: Volumetric. The rated with gas as it 8 mm x 180 cm glass a gas buret. The to solute gas plus solv tained at 1 atm as t	solvent is satu- flows through an helix attached to tal pressure of ent vapor is main-	SOURCE AND 1. Krypt 2. 1,4-E Kodak 3. 1,4-E Kodak	PURITY OF MATER con. Linde Ain Dimethylbenzer white label Dichlorobenzer white label	Products Co. ne. Eastman . Distilled.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Saylor, J.H.; Battino, R.
2. Bromobenzene; C ₆ H ₅ Br; 108-86-1	
6.5	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 1334-1337.
VARIABLES:	PREPARED BY:
T/K: 288.15 - 328.15 P/kPa: 101.325 (1 atm)	U.I. Clover J.I. Cremen
17K1d. 101.525 (1 dcm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^3$	α L
288.15 2.38	0.510 0.538
298.15 2.29 313.15 2.14	0.487 0.532 0.448 0.514
328.15 2.04	0.423 0.508
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln In$	V = _2005 7 ± 60 024 m
Smootned Data: $\Delta G / J \mod = - RT \ln Q$	$n_1 = -3005.7 \pm 00.924 \text{ T}$
Std. Dev. $\Delta G^{\circ} = 9.1, C$	
	$\Delta s^{\circ}/J K^{-1} mol^{-1} = -60.924$
T/K Mol Fra	iction $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ ×	103
$ \begin{array}{c cccccccccccccccccccccccccccccccccc$	8 14,470 3 14,774
298.15 2.2	8 15,079
303.15 2.2	4 15,383
308.15 2.1	
313.15 2.1 318.15 2.1	
323.15 2.0	
328.15 2.0	4 16,907
Solubility values were adjusted to a p	artial pressure of krypton of
101.325 kPa (1 atm) by Henry's law. E by the compiler.	Bunsen coefficients were calculated
by the complete.	
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evacu-	1. Krypton. Linde Air Products Co.
ating the space above it, shaking, and then passing it as a fine mist into	2. Bromobenzene. Eastman Kodak Co.,
another evacuated container. The de-	white label. Dried over P_4O_{10} ,
gassed liquid was saturated as it	distilled, b.p. 155.86 -
passed as a thin film inside a glass	155.90°C.
helix which contained the solute gas	155.90 C.
plus solvent vapor at a totalpres- sure of 1 atm (1,2). The volume of	
liquid and the volume of gas absorbed	
are determined in a system of burets.	
l	ESTIMATED ERROR:
	$\delta T/K = 0.03$
	$\delta P/mmHg = 1.0$
	$\delta X_1 / X_1 = 0.005$ (authors)
1	REFERENCES:
1	1. Morrison, T.J.; Billett, F.
	<u>J. Chem. Soc</u> . 1948, 2033.
	2. Clever, H.L.; Battino, R.;
	Saylor, J.H.; Gross, P. M.
)	<u>J. Phys. Chem</u> . 1957, <u>61</u> , 1078.

OMPONENTS :				AL MEASUREMENT	S:	
	r; 7439-90-9		CIEV	er, H.L.		
$C_8H_{10}; 106$	ylbenzene (p-Xyl -42-3	lene);				
3. 1,4-Dibrom	obenzene; C ₆ H ₄ Br	: ₂ ;	<u>j.</u>	<u>hys</u> . <u>Chem</u> . 1	957, <u>61</u> , 1082-	1083.
106-37-6	0 4	2				
ARIABLES: T/K.	303.15		PREPA	RED BY:		
P/kPa: 101.325 (1 atm)			C.E. Eddleman A.L. Cramer			
1,4-Dibromoben	zene/X ₃ : 0-0.25	5				
XPERIMENTAL VALU	ES:				<u></u>	·
T/K		Iol Fract	ion	Bunsen	Ostwald	
	benzene Mol Fraction v	X ₁ × 10	3	Coefficient a	Coefficient L	
	X					
303.15	0.0 0.130	3.81 3.41		0.687 0.618	0.762 0.686	
	0.255	3.13		0.569	0.631	
		AUXILIARY	INFORM	IATION		
			SOURC	E AND PURITY OF		
Volumetric.	The solvent is as it flows thr	is satu-		E AND PURITY OF	MATERIALS; nde Air Produc	ts Co
Volumetric. rated with gas 3 mm x 180 cm	The solvent is as it flows thr glass helix atta	is satu- rough an ached to	SOURC	E AND PURITY OF Krypton. Li 1,4-Dimtheyl	nde Air Produc	man
Volumetric. cated with gas 3 mm x 180 cm a gas buret. solute gas plu	The solvent i as it flows thr glass helix atta The total pressu is solvent vapor	is satu- rough an ached to ure of	SOURC 1. 2.	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white	nde Air Produc benzene. East label. Distil	man led.
Volumetric. rated with gas 3 mm x 180 cm a gas buret. solute gas plu tained at 1 at	The solvent is as it flows thr glass helix atta The total pressu	is satu- rough an ached to ure of	SOURC	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white	nde Air Produc benzene. East label. Distil	man led. an tal-
Volumetric. rated with gas 3 mm x 180 cm a gas buret. solute gas plu tained at 1 at	The solvent i as it flows thr glass helix atta The total pressu is solvent vapor	is satu- rough an ached to ure of	SOURC 1. 2. 3.	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice	nde Air Produc benzene. East label. Distil penzene. Eastm label. Recrys	man led. an tal-
Volumetric. rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed.	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is IRE:	is satu- rough an ached to ure of is main-	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice	nde Air Produc benzene. East label. Distil penzene. East label. Recrys and dried in a	man led. an tal-
Volumetric. rated with gas a mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparatus	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is URE: tus is a modification of Morrison and	is satu- rough an ached to ure of is main- is main- ation of Billett	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice	nde Air Produc benzene. East label. Distil penzene. Eastm label. Recrys and dried in a	man led. an tal-
rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparat the apparatus (1). The modi	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is TRE: cus is a modification and fications include	is satu- rough an ached to ure of is main- is main- Billett de the	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice ATED ERROR: $\delta T/$ $\delta P/mmH$ $\delta X_1/2$	nde Air Produc benzene. East label. Distil penzene. East label. Recrys and dried in a /K = 0.05 ig = 3	man led. an tal-
Volumetric. rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparatus (1). The modi addition of a solvent, a man	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is WRE: cus is a modificat of Morrison and ifications includ helical storage nometer for a ref	is satu- rough an ached to ure of is main- ation of Billett de the for the ference	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice ATED ERROR: $\delta T/$ $\delta P/mmH$ $\delta X_1/Y$ EENCES:	nde Air Produc benzene. East label. Distil penzene. East label. Recrys and dried in a (K = 0.05 Ig = 3 (1 = 0.03	man led. an tal- ir.
Volumetric. rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparatus (1). The modi addition of a solvent, a man pressure, and highly soluble	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is URE: us is a modificat of Morrison and ifications includ helical storage nometer for a ref an extra buret for a gases. The sol	is satu- rough an ached to ure of is main- is main- de the for the ference for lvent is	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice WATED ERROR: $\delta T/$ $\delta P/mmH$ $\delta X_1/2$ EENCES: Morrison, T. J. Chem. Soc	nde Air Production benzene. Eastril label. Distil penzene. Eastril label. Recrys and dried in a (K = 0.05 Ig = 3 (1 = 0.03) J.; Billett, F 2. 1948, 2033;	man led. an tal- ir.
Volumetric. rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparatus (1). The modi addition of a solvent, a man pressure, and highly soluble degassed by a	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor im as the gas is URE: tus is a modificat of Morrison and difications includ helical storage nometer for a ref an extra buret f	is satu- rough an ached to ure of is main- is main- Billett de the for the ference for lvent is the	SOURC 1. 2. 3. ESTIM REFER 1.	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice ATED ERROR: $\delta T/$ $\delta P/mmH$ $\delta X_1/2$ EENCES: Morrison, T. J. Chem. Soc <u>ibid</u> . 1952,	nde Air Produc benzene. East label. Distil penzene. East label. Recrys and dried in a (K = 0.05 Ig = 3 (1 = 0.03 J.; Billett, F 2. 1948, 2033; 3819.	man led. an tal- ir.
Volumetric. rated with gas 8 mm x 180 cm a gas buret. solute gas plu tained at 1 at absorbed. PPARATUS/PROCEDU The apparatus (1). The modi addition of a solvent, a man pressure, and highly soluble degassed by a	The solvent is as it flows thr glass helix atta The total pressu is solvent vapor of as the gas is TRE: us is a modificat of Morrison and fications includ helical storage nometer for a ref an extra buret f e gases. The sol modification of	is satu- rough an ached to ure of is main- is main- Billett de the for the ference for lvent is the	SOURC 1. 2. 3. ESTIM	E AND PURITY OF Krypton. Li 1,4-Dimtheyl Kodak white 1,4-Dibromok Kodak white lized twice ATED ERROR: $\delta T/$ $\delta P/mmF$ $\delta X_1/2$ EENCES: Morrison, T. J. Chem. Soc <u>ibid</u> . 1952, Baldwin, R.F	nde Air Production benzene. Eastril label. Distil penzene. Eastril label. Recrys and dried in a (K = 0.05 Ig = 3 (1 = 0.03) J.; Billett, F 2. 1948, 2033;	man led. an tal- ir.

<u>,</u>	
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Saylor, J.H.; Battino, R.
2. Iodobenzene; C ₆ H ₅ I; 591-50-4	
2. 10000000000, 0 ₆ .5-7, 052 50 4	
	J. Phys. Chem. 1958, 62, 1334-1337.
VARIABLES:	
T/K: 288.15 - 328.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$	α L
	0.349 0.368
298.15 1.70 313.15 1.63	0.339 0.370 0.322 0.369
328.15 1.58	0.309 0.371
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -1841.9 + 59.241 T$
Std. Dev. $\Delta G^{O} = 8.3$,	Coef. Corr. = .9999
$\Delta H^{O} / J \text{ mol}^{-1} = -1841.9,$	$\Delta s^{0}/J K^{-1} mol^{-1} = -59.241$
T/K Mol Fra	$\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ x	10 ³
288.15 1.7 293.15 1.7	74 15,228 71 15,525
	59 15,821
	57 16,117
308.15 1.6	•
	· · ·
318.15 1.6 323.15 1.6	•
328.15 1.5	
Solubility values were adjusted to a p	partial pressure of krypton of 101.325
kPa (1 atm) by Henry's law. Bunsen co	efficients were calculated by the
compiler.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evacu-	1. Krypton. Linde Air Products Co.
ating the space above it, shaking, and then passing it as a fine mist into	2. Iodobenzene. Eastman Kodak white
another evacuated container. The de-	label. Shaken with aq. Na ₂ S ₂ O ₃ ,
gassed liquid was saturated as it	dried over P_4O_{10} , distilled.
passed as a thin film inside a glass	
helix which contained the solute gas	b.p. 77.40 - 77.60 ⁰ C (20 mmHg).
plus solvent vapor at a total pres- sure of 1 atm (1,2). The volume of	
liquid and the volume of gas absorbed	
are determined in a system of burets.	
	ESTIMATED ERROR:
	$\delta T/K = 0.03$
	$\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005 \text{ (authors)}$
	REFERENCES:
	1. Morrison, T.J.; Billett, F.
	J. Chem. Soc. 1948, 2033.
	2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
1	Saylor, J.H.; Gross, P.M. J. Phys. <u>Chem</u> . 1957, <u>61</u> , 1078.
1	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Clever, H.L.
<pre>2. 1,4-Dimethylbenzene (p-Xylene); C₈H₁₀; 106-42-3</pre>	
3. 1,4-Diiodobenzene; C ₆ H ₄ I ₂ ; 624-38-4	<u>J</u> . <u>Phys</u> . <u>Chem</u> . 1957, <u>61</u> , 1082-1083.
VARIABLES: T/K: 303.15	PREPARED BY:
P/kPa: 101.325 (1 atm) 1,4-Diiodobenzene/X ₃ : 0-0.078	C.E. Eddleman A.L. Cramer
EXPERIMENTAL VALUES:	L
T/K 1,4-Diiodo- Mol Fract benzene Mol Fraction X ₁ x 10 X ₃	Coefficient Coefficient
303.15 0.0 3.81 0.078 3.48	0.687 0.762 0.626 0.695
The solubility values were adjusted to 101.325 kPa (1 atm) by Henry's law.	a partial pressure of krypton of
The Bunsen coefficients were calculate	d by the compiler
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The solvent is satu-	1. Krypton. Linde Air Products Co.
rated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is main-	2. 1,4-Dimethylbenzene. Eastman Kodak white label. Distilled.
tained at 1 atm as the gas is ab- sorbed.	3. 1,4-Diiodobenzene. Eastman Kodak white label. Recrystal- lized twice and dried in air.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE: The apparatus is a modification of the apparatus of Morrison and Billett	$\delta T/K = 0.05$
(1). The modifications include the addition of a helical storage for the	$\delta x_1 / x_1 = 0.03$
(1). The modifications include the addition of a helical storage for the solvent, a manometer for a reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification of the method of Baldwin and Daniel (2).	$\delta x_1 / x_1 = 0.03$
addition of a helical storage for the solvent, a manometer for a reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification of the	$\delta X_1 / X_1 = 0.03$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033;

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 Powell, R.J. 2. 1,1,2,2,3,3,4,4,4-nonafluoro-N, N-bis (nonafluorobutyl)-1butanamine (Perfluorotributyl-amine); $(C_4F_9)_3N$; 311-89-7 J. Chem. Eng. Data 1972, 17, 302-304. VARIABLES: PREPARED BY: т/к: 298.15 P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Mol Fraction $R\frac{\Delta \log x_1}{\Delta \log T} = N$ Bunsen Ostwald Coefficient Coefficient $x_{1} \times 10^{3}$ α L 0.708 0.773 298.15 11.15 -3.30 The author implies that solubility measurements were made between 288.15 and 318.15 K, but only the solubility at 298.15 was given in the paper. The slope $R(\Delta \log x_1/\Delta \log T)$ was given. The smoothed data below were calculated by the compiler from the slope in the form: $\log x_1 = \log(11.15 \times 10^{-3}) + (-3.30/R) \log(T/298.15)$ with R = 1.9872 cal K^{-1} mol⁻¹. Smoothed Data: T/K Mol Fraction $X_1 \times 10^3$ 288.15 11.81 293.15 11.47 298.15 11.15 303.15 10.85 10.55 308.15 313.15 10.28 318.15 10.01 The Bunsen and Ostwald Coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Solvent is degassed by freezing and 1. Krypton. No source. Manupumping, then boiling under reduced pressure. The Dymond and Hildebrand facturer's research grade, dried over CaCl₂ before use. (1) apparatus, with all glass pumping system, is used to spray slugs of de-Perfluorotributylamine. 2. gassed solvent into the krypton. Minnesota Mining & Mfg. Co. Amount of gas dissolved is calculated Column distilled, used portion from the initial and final gas with b.p. = 447.85 - 448.64K, pressure. & single peak GC. ESTIMATED ERROR: δ N /cal $K^{-1} \mod^{-1} = 0.1$ δ $X_1/X_1 = 0.002$ **REFERENCES:** 1. Dymond, J.; Hildebrand, J.H. Ind. Eng. Chem. Fundam. 1967, 6, 130.

COMPONENTS:	ORIGIN	AL MEASURE	MENTS:		
1. Krypton; Kr; 7439-90-9	Notz	, K. J.;	Meservey, A	А. В.	
⁸⁵ Kr; 13983-27-2					
2. Carbon Dioxide; CO ₂ ; 124-38-9		ORNL-5121, June 1976 <u>Chem</u> . <u>Abstr</u> . 1977, <u>86</u> , 61170c, 79549t			
VARIABLES:	PREPAR	PREPARED BY:			
T/K: 223.15 - 301.15		A. L. Cramer H. L. Clever			
EXPERIMENTAL VALUES:			0		
$x_1 \times z_1$	Coef	nsen ficient ¤	Ostwald Coefficient L	:	
223.15 5.72	2 3.3	370	2.75	-	
233.15 5.48	3.3	126	2.67		
243.15 5.26		894	2.57		
253.15 5.26		771	2.57		
263.15 5.38 273.15 5.61		701 655	2.60 2.66		
273.15 5.61		542	2.66		
293.15 6.51		564	2.75		
297.15 6.93	7 2.	567	2.79		
301.15 8.46	5 2.	808	3.10		
at 301.15 K was not included in t Another report (1) on this system The results are thought to be in	the smoothed	d data f	r by a facto	or of 2.	
Another report (1) on this system	the smoothed	d data f	it. r by a facto	or of 2.	
Another report (1) on this system The results are thought to be in error.	the smoothed	d data f ues lowe use of a	it. r by a facto	or of 2.	
Another report (1) on this system The results are thought to be in error.	the smoothed n gives val error beca	d data f ues lowe: use of a ATION	it. r by a facto	or of 2. sampling	
Another report (1) on this system The results are thought to be in error. METHOD: Tracer technique. Collimated counter with equilibrated gas-lic samples. Krypton gas was 5 per o	the smoothed n gives valuerror beca LLIARY INFORM SOURCE 1. quid cent	d data f ues lowe use of a ATION AND PURIT Krypton. Labs. U	it. r by a facto systematic TY OF MATERIAL Cryogenic ltra high pu	or of 2. sampling S: Rare Gas arity grade.	
Another report (1) on this system The results are thought to be in error. METHOD: Tracer technique. Collimated counter with equilibrated gas-lice	LLIARY INFORM Guid cent Kr. 2.	d data f ues lowe use of a ATION AND PURIT Krypton. Labs. U Krypton- Carbon d	it. r by a facto systematic TY OF MATERIAL Cryogenic ltra high pu	or of 2. sampling S: Rare Gas mrity grade. es Div., ORNL cheson Co.,	
Another report (1) on this system The results are thought to be in error. AUXI METHOD: Tracer technique. Collimated counter with equilibrated gas-lic samples. Krypton gas was 5 per con- ⁸⁵ Krypton and 95 per cent stable The total pressure of the system the equilibrium pressure of lique CO ₂ + the Kr pressure.	the smoothed n gives value error beca (LLIARY INFORM) (LLIARY INFORM) (SOURCE 1. 1. 2. id 2.	d data f ues lowe use of a ATION AND PURIT Krypton. Labs. U Krypton- Carbon d	it. r by a facto systematic IV OF MATERIAL Cryogenic ltra high pu 85. Isotope ioxide. Mat search grade	or of 2. sampling S: Rare Gas mrity grade. es Div., ORNL cheson Co.,	
Another report (1) on this system The results are thought to be in error. METHOD: Tracer technique. Collimated counter with equilibrated gas-lic samples. Krypton gas was 5 per constable The total pressure of the system the equilibrium pressure of liquation.	the smoothed n gives value error beca (LLIARY INFORM) (LLIARY INFORM) (SOURCE 1. 1. 2. id 2.	d data f ues lowe use of a ATION ATION AND PURIT Krypton. Labs. U Krypton- Carbon d Inc. Re ATED ERROR &L/L =	it. r by a facto systematic IV OF MATERIAL Cryogenic ltra high pu 85. Isotope ioxide. Mat search grade	S: Rare Gas rity grade. Div., ORNL cheson Co.,	
Another report (1) on this system The results are thought to be in error. AUXI METHOD: Tracer technique. Collimated counter with equilibrated gas-lic samples. Krypton gas was 5 per con- ⁸⁵ Krypton and 95 per cent stable The total pressure of the system the equilibrium pressure of lique CO ₂ + the Kr pressure.	LLIARY INFORM Guid cent Kr. was id ESTIMA	d data f ues lowe use of a ATION ATION AND PURIT Krypton. Labs. U Krypton- Carbon d Inc. Re ATED ERROR &L/L =	it. r by a facto systematic TY OF MATERIAL Cryogenic ltra high pu 85. Isotope ioxide. Mat search grade : 0.006 at 220	or of 2. sampling S: Rare Gas mrity grade. S: Div., ORNL cheson Co.,	

COMPORTS: BIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 $85_{Kr; 13983-27-2}$ 2. Carbon Dioxide; CO_2 ; 124-38-9 ORNL-5121, June 1976 Chem. Abstr. 1977, 86, 61170c, 79548t. VARIABLES: r/K: 223.15 - 301.15 T/K: 223.15 - 301.15 AL. Cramer H.L. Clever ENVERIMENTAL VALUES: Smoothed Data: $\ln x_1 = 41.5327 - 65.4529/(T/100) - 67.2463 ln (T/100) + 16.4072 (T/100) Std. error about regression line 5.429 x 10-3. T/K< Mol Fraction \Delta G^0/kJmol^{-1} \Delta G^0/kJmol^{-1} \Delta G^0/JK^{-1}mol^{-1} \Delta Cp^0/JK^{-1}mol^{-1} x_1 x 10^2 233.15 5.73 1.578 233.15 5.36 11.44 1.78 3.480 233.15 5.36 11.44 233.15 5.36 11.44 233.15 5.400 12.23 233.15 5.400 12.48 233.15 5.400 12.48 233.15 5.400 12.48 233.15 5.400 12.48 233.15 5.60 1.78 3.480 233.15 5.60 1.24 7.748 234.15 5.99 1.23 5.986 234.13 5.99 1.13$			· · · · · · · · · · · · · · · · · · ·			
85 Kr; 13983-27-2 ORNL-5121, June 1976 Chem. Abstr. 1977, <u>86</u> , 61170c,79548t. VARIABLES: T/K: 223.15 - 301.15 PREFARED BY: H.L. Clower EXPERIMENTAL VALUES: PREFARED BY: 	COMPONENTS:	-90-9	ORIGINAL MEASUREMENTS: Notz, K.J.: Meservey, A. B.			
2. Carbon Dioxide; CO_2 ; 124-38-9 ORNL-5121, June 1976 Chem. Abstr. 1977, <u>86</u> , 61170c, 79548t. VARIABLES: T/K: 223.15 - 301.15 PREPARED BY: A.L. Cramer 			ACC2, ACC, MESELVEY, A. D.			
Chem. Abstr. 1977, 85, 61170c,79548t. VARTABLES: A.L. Cramer T/K: 223.15 - 301.15 EXPERIMENTAL VALUES: Smoothed Data: In X ₁ = 41.5327 - 65.4529/(T/100) - 67.2463 ln (T/100) + 16.4072 (T/100) Std. error about regression line 5.429 x 10 ⁻³ . T/K MOI Fraction $\Delta G^O/kJmol^{-1} \Delta f^O/kJmol^{-1} \Delta S^O/JK^{-1}mol^{-1} \Delta f^O/JK^{-1}mol^{-1} x_1 x 10^3$ 223.15 5.73 9.578 -2.416 -53.75 49.71 233.15 5.45 10.10 -1.782 -50.98 77.00 243.15 5.30 10.59 -0.876 -47.18 104.3 253.15 5.66 11.44 1.755 -36.81 158.8 273.15 6.60 12.24 7.748 -123.20 213.4 293.15 6.69 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILLARY INFORMATION See preceeding page. METHOD: Source AND PURITY OF MATERIALS; See preceeding page. REFERENCES; REFERENCES;	⁰⁵ Kr; 13	983-27-2				
A.L. Cramer H.L. Clever A.L. Cramer H.L. Clever EXPERIMENTAL VALUES: Smoothed Data: $\ln X_1 = 41.5327 - 65.4529/(T/100) - 67.2463 \ln (T/100) + 16.4072 (T/100)Std. error about regression line 5.429 x 10-3. T/K Mol Fraction \Delta G^O/kJmol^{-1} \Delta H^O/kJmol^{-1} \Delta S^O/JK^{-1}mol^{-1} \Delta Cp^O/JK^{-1}mol^{-1} 223.15 5.73 9.578 -2.416 -50.98 77.00 233.15 5.30 10.10 -1.782 -50.98 77.00 243.15 5.30 10.10 -1.782 -50.98 77.00 243.15 5.30 10.10 -1.782 -50.98 77.00 243.15 5.30 10.10 -1.782 -50.98 77.00 243.15 5.30 10.10 -1.782 -36.68 156.8 253.15 5.66 11.74 40.302 -42.41 131.6 233.15 6.60 12.24 7.748 -15.32 20 213.4 233.15 6.60 12.24 7.748 -23.20 213.4 234.15 6.60 12.24 7.748 -15.32 240.7 298.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: Source AND PURITY OF MATERIALS: See preceeding page. APPARATUS/PROCEDURE: See preceeding page. REFERENCES: $	2. Carbon Dioxide; C	0 ₂ ; 124-38-9		c,79548t.		
H.L. Clever H.L. Clever EXPERIMENTAL VALUES: Smoothed Data: $\ln x_1 = 41.5327 - 65.4529/(T/100) - 67.2463 ln (T/100) + 16.4072 (T/100) Std. error about regression line 5.429 x 10-3. T/K Mol Fraction \Delta G^0/kJmol^{-1} \Delta H^0/kJmol^{-1} \Delta S^0/JK^{-1}mol^{-1} \Delta Cp^0/JK^{-1}mol^{-1} 223.15 5.73 9.578 -2.416 -53.75 49.71 233.15 5.45 10.10 -1.782 -50.98 77.00 243.15 5.30 10.59 -0.876 -47.18 104.3 253.15 5.26 11.04 +0.302 -424.31 131.6 253.15 5.60 11.78 3.480 -30.38 186.1 283.15 6.60 12.24 7.748 -23.20 213.4 293.15 6.60 12.24 7.748 -23.20 213.4 293.15 6.60 12.24 7.748 -23.20 240.7 298.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: See preceeding page. See preceeding page. APPARATUS/PROCEDURE: See preceeding page. REFERENCES: $	VARIABLES:		PREPARED BY:			
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Smoothed Data: In $X_1 = 41.5327 - 65.4529/(T/100) - 67.2463 ln (T/100) + 16.4072 (T/100) Std. error about regression line 5.429 x 10-3. \overline{T/K} Mol Fraction \Delta G^0/kJmol^{-1} \Delta H^0/kJmol^{-1} \Delta S^0/JK^{-1}mol^{-1} \Delta Cp^0/JK^{-1}mol^{-1} 223.15 5.73 9.576 233.15 5.45 10.10 243.15 5.30 10.59 5.30 10.59 -0.876 273.15 5.26 11.04 263.15 5.26 11.78 273.15 5.60 12.24 273.15 5.60 12.24 273.15 5.60 12.24 273.15 5.60 12.24 273.15 5.60 12.24 273.15 5.60 12.24 273.15 5.60 12.24 7.748 -15.32 240.7 298.15 6.99 12.30 8.986 -11.13 254.3 AUXILIARY INFORMATION METHOD: See preceeding page. ESTIMATED EREOR: See preceeding page. REFERENCES: $	- ,		H.L. Clever			
$\frac{+ 16.4072 (T/100)}{\text{Std. error about regression line 5.429 x 10}^{-3}.$ $\frac{\text{Std. error about regression line 5.429 x 10}^{-3}.$ $\frac{\text{T/K} \text{ Mol Fraction } \Delta \text{G}^{0}/\text{kJmol}^{-1} \Delta \text{H}^{0}/\text{kJmol}^{-1} \Delta \text{S}^{0}/\text{JK}^{-1}\text{mol}^{-1} \Delta \text{Cp}^{0}/\text{JK}^{-1}\text{mol}^{-1}}{223.15 5.73 9.578 -2.416 -53.75 49.71}$ $\frac{\text{Z23.15 } 5.73 9.578 -2.416 -53.75 49.71}{233.15 5.45 10.10 -1.782 -50.99 77.00}$ $\frac{243.15 5.26 11.04 +0.302 -42.43 1131.6}{253.15 5.26 11.04 +0.302 -42.43 1131.6}$ $\frac{273.15 5.60 11.78 3.480 -30.38 196.1}{233.15 6.60 12.24 7.748 -23.20 213.4}$ $\frac{293.15 6.60 12.24 7.748 -15.32 240.7}{298.15 6.99 12.30 8.986 -11.13 254.3}$ The mol fraction solubility at 301.15 K was not used in the smoothed data fit. $\frac{\text{AUXILLARY INFORMATION}}{\text{METHOD:}}$ See preceeding page. $\frac{\text{SURCE AND PURITY OF MATERIALS;}{\text{See preceeding page.}}$	EXPERIMENTAL VALUES:					
Std. error about regression line 5.429 x 10^{-3} . T/K Mol Fraction $\Delta G^{O}/kJmol^{-1} \Delta H^{O}/kJmol^{-1} \Delta S^{O}/JK^{-1}mol^{-1} \Delta Cp^{O}/JK^{-1}mol^{-1}$ 23.15 5.73 9.578 -2.416 -53.75 49.71 23.15 5.73 10.10 -1.782 -50.98 77.00 23.15 5.35 10.10 $+1.782$ -50.98 77.00 23.15 5.36 11.04 $+0.302$ -42.43 131.6 253.15 5.36 11.44 1.755 -36.81 158.8 273.15 5.60 12.25 3.480 -30.38 186.1 233.15 6.00 12.24 7.748 -15.32 240.7 293.15 6.60 12.24 7.748 -15.32 240.7 293.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. MUXILIARY INFORMATION METHOD: Source AND PURITY OF MATERIALS; See preceeding page. ESTIMATED ERROR: See preceeding page. REFERENCES:	Smoothed Data: ln X ₁			.00)		
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243.15 5.30 10.59 -0.876 -47.18 104.3 253.15 5.26 11.04 +0.302 -42.43 131.6 263.15 5.36 11.44 1.755 -36.81 158.8 273.15 5.60 11.78 3.480 -30.38 186.1 283.15 5.60 12.05 5.478 -23.20 213.4 293.15 6.60 12.24 7.748 -15.32 240.7 298.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. METHOD: See preceeding page. APPARATUS/PROCEDURE: APPARATUS/PROCEDURE: ESTIMATED ERROR: See preceeding page. See preceeding page.	223.15 5.73					
253.15 5.26 11.04 +0.302 -42.43 131.6 263.15 5.36 11.44 1.755 -36.81 158.8 273.15 5.60 11.78 3.480 -30.38 186.1 283.15 6.00 12.05 5.478 -23.20 213.4 293.15 6.60 12.24 7.748 -24.43 131.6 Z37.1755 5 5.478 -23.20 213.4 293.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: Source AND PURITY OF MATERIALS: See preceeding page. APPARATUS/PROCEDURE: See preceeding page. REFERENCES: REFERENCES:	233.15 5.45 243.15 5.30					
273.15 5.60 11.78 3.480 -30.38 186.1 283.15 6.00 12.05 5.478 -23.20 213.4 293.15 6.60 12.24 7.748 -15.32 240.7 298.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: See preceeding page. See preceeding page. See preceeding page. See preceeding page. APPARATUS/PROCEDURE: APPARATUS/PROCEDURE: ESTIMATED ERROR: See preceeding page.	253.15 5.26	11.04	+0.302 -42.43 1	.31.6		
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298.15 6.99 12.30 8.986 -11.13 254.3 The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: Source AND PURITY OF MATERIALS; See preceeding page. ESTIMATED ERROR: See preceeding page. APPARATUS/PROCEDURE: ESTIMATED ERROR: See preceeding page. REFERENCES:	283.15 6.00		5.478 -23.20 2			
The mol fraction solubility at 301.15 K was not used in the smoothed data fit. AUXILIARY INFORMATION METHOD: See preceeding page. See preceeding page. APPARATUS/PROCEDURE: ESTIMATED EREOR: See preceeding page. REFERENCES:	293.15 6.60		7.748 - 15.32 2			
METHOD: See preceeding page. See preceeding page. See preceeding page. APPARATUS/PROCEDURE: ESTIMATED ERROR: See preceeding page. REFERENCES:						
See preceeding page. See preceeding page. APPARATUS/PROCEDURE: ESTIMATED ERROR: See preceeding page. REFERENCES: REFERENCES:		AUXIL	RY INFORMATION			
APPARATUS/PROCEDURE: See preceeding page. REFERENCES:	METHOD:		SOURCE AND PURITY OF MATERIALS:			
APPARATUS/PROCEDURE: See preceeding page. REFERENCES:	See preceeding page.		See preceeding page.			
APPARATUS/PROCEDURE: See preceeding page. REFERENCES:						
See preceeding page. REFERENCES:			ESTIMATED ERROR:			
	APPARATUS/PROCEDURE:		See preceeding page.			
See preceeding page.			REFERENCES :			
			See preceeding page.			

COMPONENTS : ORIGINAL MEASUREMENTS: Krypton; Kr; 7439-90-9 1. Powell, R.J. 2. Carbon Disulfide; CS₂; 75-15-0 J. Chem. Eng. Data 1972, 17, 302-304. VARIABLES: PREPARED BY: T/K: 298.15 P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Mol Fraction $R\frac{\Delta \log x_1}{\Delta \log T} = N$ Bunsen Ostwald Coefficient Coefficient $x_{1} \times 10^{3}$ α L 298.15 1.756 0.650 0.710 -7.30The author implies that solubility measurements were made between 273.15 and 308.15 K, but only the solubility at 298.15 was given in the paper. The slope $R(\Delta \log x_1/\Delta \log T)$ was given. The smoothed data below were calculated by the compiler from the slope in the form: $\log x_1 = \log(1.756 \times 10^3) + (-7.30/R) \log(T/298.15)$ with R = 1.9872 cal K^{-1} mol⁻¹. Smoothed Data: T/K Mol Fraction $x_1 \times 10^3$ 273.15 2.422 278.15 2.266 283.15 2.122 288.15 1.980 293.15 1.868 298.15 1.756 303.15 1.652 The Bunsen and Ostwald Coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD / APPARATUS / PROCEDURE : SOURCE AND PURITY OF MATERIALS: Solvent is degassed by freezing and 1. Krypton. No source. Manufacpumping, then boiling under reduced pressure. The Dymond and Hildebrand turer's research grade, dried over CaCl, before use. (1) apparatus, with all glass pumping system, is used to spray slugs of de-Carbon disulfide. No source 2. gassed solvent into the krypton. given. Manufacturer's spectro-Amount of gas dissolved is calculated chemical grade. from the initial and final gas pressures. ESTIMATED ERROR: $\delta \text{ N /cal } \kappa^{-1} \text{mol}^{-1} = 0.1 \\ \delta x_1 / x_1 = 0.002$ **REFERENCES:** Dymond, J.; Hildebrand, J.H. Ind. Eng. Chem. Fundam. 1967, 1. 6, 130.

COMPONENTS:	ORIGINAL MEASUREMENTS:
	Dymond, J. H.
1. Krypton, Kr; 7439-90-9	Dymond, U. H.
2. Sulfinylbismethane (Dimethyl Sulf- oxide); C ₂ H ₆ OS (CH ₃ SOCH ₃); 67-68-5	<u>J. Phys. Chem</u> . 1967, <u>71</u> , 1829-1831.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	M. E. Derrick
EXPERIMENTAL VALUES:	
	0-1
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^3$	α L
298.15 0.446	0.140 0.153
AUXILIARY	INFORMATION
METHOP /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The liquid is saturated with the gas at a gas partial pressure of 1 atm. The apparatus is that described by Dymond and Hildebrand (1). The apparatus uses an all-glass pumping system to spray slugs of degassed solvent into the gas. The amount of gas dissolved is calculated from the initial and final gas pressure.	 Krypton. Matheson Co. Dried. Dimethyl Sulfoxide. Matheson, Coleman, and Bell Co. Spectro- quality reagent, dried, and a fraction frozen out. Melting pt. 18.37° C.
	ESTIMATED ERROR:
	DEEEDENCEC
	REFERENCES: 1. Dymond, J.; Hildebrand, J. H. <u>Ind. Eng. Chem. Fundam</u> . 1967, <u>6</u> , 130.

COMPONENTS:					ASUREMENTS:		
1. Krypton; Kr; 7439-90-9			St	<pre>Steinberg, M.; Manowitz, B.; Pruzansky, J.</pre>			
2. Nitr	2. Nitrous Oxide; N ₂ O; 10024-97-2		US	US AEC BNL-542 (T-140). Chem. Abstr. 1959, <u>53</u> , 21242g.			
VARIABLES				DDD	PARED BY	7.	<u></u>
			2 65	I' Kr	FARED DI		
Т	'/K: .	190.15 - 24	3.65			H. L. Clever	
EXPERIMENT	AL VAL	UES:					
T/		osorption		Mol Fr	action	Bunsen	Ostwald
	C	Defficient	Constant <u>K/atm</u>	×1 ×	10 ²	<u>a</u>	Coefficient
190.		8.7	-		30	8.2	5.7
193. 201.		8.5	88		30 14	8.1	5.7
215.	15	5.0	-		79 64 ⁵	4.7	3.7
236.		3.8	- 166	0.	64 ~ 64	3.6	3.1
240. 243.		-	155 165	0.	64 605	_	-
Smoothed		• AG ⁰ /T mo	$1^{-1} = - p^{-1}$			41.0 + 66.134	т
SHOOTNED	Data					r. = 0.9984	-
			. 25 - 65 1 ⁻¹ 5 7	/, CUE	S ⁰ /.T *	$-1 \text{ mol}^{-1} = -60$	6.134
			T/K Mol	Fracti	on ∆G'	∼∕J mol [⊥]	
			X	^x 1 × 10 ²	·		
		1	93.15	1.25		7,032.8	
		2	93.15	T.02	•	7,694.1	
		2	13.15	0.896	- 1	7,694.1 8,355.4	
		2222	13.15	0.896	-	7,694.1 8,355.4 9,016.8 9,678.1	
		2 2 2 2 2	13.15	0.896	-	7,694.1 8,355.4 9,016.8	
		2 2 2 2 2	13.15 23.15 23.15	0.896	-	7,694.1 8,355.4 9,016.8 9,678.1	
		2 2 2 2 2	13.15 23.15 23.15	0.896	-	7,694.1 8,355.4 9,016.8 9,678.1	
		2 2 2 2 2	13.15 23.15 23.15	0.896	-	7,694.1 8,355.4 9,016.8 9,678.1	
		22222	AUXII	0.896	1	7,694.1 8,355.4 9,016.8 9,678.1 0,339	
METHOD/AE	PPARAT	2 2 2 2 2	AUXII	0.896 0.775 0.679 0.601	ORMATION JRCE AND	7,694.1 8,355.4 9,016.8 9,678.1 0,339 PURITY OF MATER	IALS:
		22222	AUXII	0.896 0.775 0.679 0.601	ORMATION	7,694.1 8,355.4 9,016.8 9,678.1 0,339 PURITY OF MATER	IALS :
Dynamic	trace	US/PROCEDUR	AUXII	0.896 0.775 0.679 0.601	ORMATION JRCE AND Kryp	7,694.1 8,355.4 9,016.8 9,678.1 0,339 PURITY OF MATER	IALS:
Dynamic The Henr	trace: y's c	US/PROCEDUR r techniqu	AUXII	0.896 0.775 0.679 0.601	ORMATION URCE AND Kryp Nitro No in	7,694.1 8,355.4 9,016.8 9,678.1 0,339 PURITY OF MATER ton.	
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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Friedman, H.L.
2. Nitromethane; CH ₃ NO ₂ ; 75-52-5	
	J. Am. Chem. Soc. 1954, 76,
	3294-3297.
VARIABLES: T/K: 298.00	PREPARED BY:
P/kPa: 101.325 (1 atm)	P.L. Long
	, i i i i i i i i i i i i i i i i i i i
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
$x_1 \times 10^3$ C	coefficient Coefficient
298.00	0.381 0.378
	0.378
0.838	0.348 0.380 av.
The author reports Ostwald coefficient	s measured at about 700 mmHg. The
Bunsen coefficient and the mole fracti	
were calculated by the compiler with t	
that Henry's law is obeyed, and that t of pressure.	he Ostwald coefficient is independent
-	
AUXILIARY	INFORMATION
	COURCE AND DUDTER OF MARDELALC.
METHOD:	SOURCE AND PURITY OF MATERIALS:
Gas absorption. The method was	1. Krypton. Air Reduction Co.
essentially that employed by Eucken and Herzberg (1). Modifications	Reagent grade, 99.8 per cent pure by mass spectroscopy.
included a magnetic stirring device	pure by mass spectroscopy.
instead of shaking the saturation	2. Nitromethane. Source not given.
vessel, and balancing the gas pres-	Distilled, dried by filtering at
sure against a column of mercury with	253 К.
electrical contacts instead of bal- ancing the gas pressure against the	
atmosphere.	
	ESTIMATED ERROR:
APPARATUS/PROCEDURE: The solvent was de-	
gassed by vacuum. The procedure, re-	$\delta T/K = 0.05$ $\delta P/mmHg = 0.3$
peated 5-10 times, was to alternate	$\delta L/L = 0.03$
5-15 s evacuation and rapid stirring	
to produce cavitation. In the solu-	REFERENCES:
bility measurement, gas, pre-saturated with solvent vapor, was brought into	4
contact with about 80 ml of solvent in	
Concace with about so mit of solvent in	1. Euken, A.; Herzberg, G.
the saturation vessel. Initial condi-	1. Euken, A.; Herzberg, G. <u>Z. Phys</u> . <u>Chem</u> . 1950, <u>195</u> , 1.
the saturation vessel. Initial condi- tions were established by a time ex-	1. Euken, A.; Herzberg, G. <u>Z. Phys</u> . <u>Chem</u> . 1950, <u>195</u> , 1.
the saturation vessel. Initial condi- tions were established by a time ex- trapolation. Solubility equilibrium	1. Euken, A.; Herzberg, G. <u>Z. Phys</u> . <u>Chem</u> . 1950, <u>195</u> , 1.
the saturation vessel. Initial condi- tions were established by a time ex-	1. Euken, A.; Herzberg, G. <u>Z. Phys</u> . <u>Chem</u> . 1950, <u>195</u> , 1.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Saylor, J.H.; Battino, R.
2. Nitrobenzene; $C_6H_5NO_2$; 98-95-3	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 1334-1337.
······································	
VARIABLES: T/K: 288.15 - 328.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fractio	
	Coefficient Coefficient
$x_1 \times 10^3$	<u>α L</u>
288.15 1.37	0.301 0.318
298.15 1.42 313.15 1.37	0.310 0.338 0.295 0.338
313.15 1.37 328.15 1.36	0.295 0.338
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = -RT$	1 - 410.02 + 56.124 - 56.02
	.0, Coef. Corr. =0.9990
$\Delta H^{O}/J \text{ mol}^{-1} = -418$.82, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -56.124$
T/K Mol	Fraction $\Delta G^{O}/J \text{ mol}^{-1}$
1/1. 101 x	1 × 10 ³
· · · · · · · · · · · · · · · · · · ·	
288.15	1.39 15,753
293.15 298.15	1.39 16,034 1.39 16,315
303.15	1.38 16,595
308.15	1.38 16,876
313.15 318.15	1.37 17,157 1.37 17,437
323.15	1.37 17,718
328.15	1.36 17,998
Solubility values were adjusted to	a partial pressure of krypton of 101.325
compiler.	n coefficients were calculated by the .
_	IARY INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by eva	
ating the space above it, shaking,	
and then passing it as a fine mist	2. Nitrobenzene. Eastman Kodak white label. Distilled from
into another evacuated container. The degassed liquid was saturated	
it passed as a thin film inside a	(10 mmHg).
glass helix which contained the	
solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The	
volume of the liquid and the volum	ie l
of gas absorbed were determined in	
a system of burets.	ESTIMATED ERROR:
	$\delta T/K = 0.03$
	$\delta P/mmHg = 1.0$
	$\delta x_1 / x_1 = 0.005 \text{ (authors)}$
	REFERENCES ;
	1. Morrison, T.J.; Billett, F.
	<u>J. Chem. Soc</u> . 1948, 2033.
	2. Clever, H.L.; Battino, R.;
	Saylor, J.H.; Gross, P.M.
	J. Phys. Chem. 1957, <u>61</u> , 1078.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Michels, A., Dumoulin, E. and Van
 Arypeon, R1, 7455 56 5 Ammonia; NH₃; 7664-41-7 	Dijk, J. J. Th., <i>Physica</i> , <u>1959</u> , 25, 840.
VARIABLES:	PREPARED BY:
Temperature, pressure	C. L. Young
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · · · ·
Mole fraction of krypto T/K P/bar in liquid, ^x Kr	n
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
One pass flow method. Ammonia added to equilibrium cell. Krypton passed through liquid ammonia for many hours. Sample of gas and liquid analysed at atmospheric pressure by adsorbing ammonia in sulfuric acid. Details in source.	No details given.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1; \delta P/bar = \pm 0.005;$ $\delta x_{Ar} = \delta y_{Ar} = \pm 0.5$ %.
	REFERENCES:

l

201/D01/D01/D12	
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Körösy, F.
2. Phosphoric Acid, Tris(methyl	
phenyl) Ester (Tricresyl Phos-	
phate); C ₂₁ H ₂₁ O ₄ P; 1330-78-5	Trans. Faraday Soc. 1937, 33,416-425.
VARIABLES: T/K: 295.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H. L. Clever
,	
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_1 \times 10^3$	α L
295.15 3.3	0.21 0.23
The mole fraction solubility and the Bu	unsen coefficient were calculated by
the compiler. It was assumed that gas h	
coefficient is independent of pressure	
An average density of the tricresyl pho	enhate isomers was used for the mole
fraction solubility calculation.	sephace isomets was used for the more
• • •	
	·
AUXILIARY	INFORMATION
ME THOD:	
	SOURCE AND PUBLITY OF MATERIALS.
	SOURCE AND PURITY OF MATERIALS:
The apparatus and method of Winkler	1. Krypton. Source not given. The
(1) were used. However, the appa-	 Krypton. Source not given. The gas contained 5 % xenon and 1 %
(1) were used. However, the appa- ratus was usually not thermostated,	1. Krypton. Source not given. The
(1) were used. However, the appa- ratus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given.
(1) were used. However, the appa- ratus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given.
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given.
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given.
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade.
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade.
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	<pre>1. Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. 2. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:</pre>
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR: δX1/X1 = 0.05 REFERENCES:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:
(1) were used. However, the apparatus was usually not thermostated, and degassing was by evacuating and shaking the solvent, not by evacuating and boiling the solvent as was done by Winkler.	 Krypton. Source not given. The gas contained 5 % xenon and 1 % non-inert gases. Tris (methylphenyl) ester of phosphoric acid. Source not given. Technical grade. ESTIMATED ERROR:

1. Krypton; Kr; 7439-90-9 Wilcock, R.J.; McHale, J.L.; Battino, B.; Wilhelm, E. 2. Octamethylcyclotetrasiloxane; CgH240454; 556-67-2 Fluid Phase Equil. 1978, 2, 225-230. VARIABLES: P/kPa: 101.325 (1 atm) Fluid Phase Equil. 1978, 2, 225-230. VARIABLES: P/kPa: 101.325 (1 atm) Fluid Phase Equil. 1978, 2, 225-230. EXPENDENTAL VALUES: Trice apparatus T/K Mol Fraction 298.35 Bunson Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coefficient Coeffi	COMPONENTS:			
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<pre>film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the buret system. The solvent is col- buret system. The solvent is col-</pre> REFERENCES· 1.Morrison,T.J.; Billett,F. J. Chem. Soc. 1948, 2033. 2.Battino, R.;Evans,F.D.;Danforth,W J.Am.Oil Chem.Soc. 1968, 45, 830. 3.Battino,R.;Banzhof,M.;Bogan, M.; Wilhelm, E.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns.	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$	
<pre>taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the buret system. The solvent is col- buret system. The solvent is col-</pre> 1.Morrison,T.J.; Billett,F. J. Chem. Soc. 1948, 2033. 2.Battino, R.;Evans,F.D.;Danforth,W J.Am.Oil Chem.Soc. 1968, 45, 830. 3.Battino,R.;Banzhof,M.;Bogan, M.; Wilhelm, E.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de-	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$	
<pre>vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the buret system. The solvent is col- wilhelm, E.</pre>	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$	
one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the buret system. The solvent is col- wilhelm, E.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con-	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$	
is found by difference between the initial and final volumes in the buret system. The solvent is col- Wilhelm, E.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of	SOURCE AND PUR 1. Kryptor Minimum 2. Octamet General density g cm ⁻³ ESTIMATED ERRO REFERENCES 1.Morrison	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$ T.J.; Billett,F.	
buret system. The solvent is col- Wilhelm, E.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO REFERENCES. 1.Morrison, J. Chem. 2. Battino,	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$ T.J.; Billett,F. Soc. 1948, 2033. R.;Evans,F.D.;Danforth,W.	
	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO REFERENCES. 1.Morrison, J. Chem. 2.Battino, J.Am.Oil	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$ T.J.; Billett,F. Soc. 1948, 2033. R.;Evans,F.D.;Danforth,W. Chem.Soc. 1968, <u>45</u> , 830.	
TERFER TH & PATCH TTADY HIM MOTORY 1 $3-1$ $4-1$ 10.21 10.2	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ . ESTIMATED ERRO REFERENCES 1.Morrison J. Chem. 2.Battino, J.Am.Oil 3.Battino,	A. Matheson Co., Inc. a per cent purity 99.995. A. Matheson Co., Inc. bylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$ T.J.; Billett,F. Soc. 1948, 2033. R.;Evans,F.D.;Danforth,W. <u>Chem.Soc</u> . 1968, <u>45</u> , 830. Chem.Soc, M.;Bogan, M.;	
lected in a tared flask and weighed. Anal. Chem. 1971, 43, 806.	METHOD /APPARATUS/PROCEDURE: The apparatus is based on the de- sign of Morrison and Billett (1), and the version used is described by Battino, Evans, and Danforth (2). The degassing apparatus and procedure are described by Battino, Banzhof, Bogan, and Wilhelm (3). Degassing. Up to 500 cm ³ of sol- vent is placed in a flask of such size that the liquid is about 4 cm deep. The liquid is rapidly stirred, and vacuum is applied intermittently through a liquid N ₂ trap until the permanent gas residual pressure drops to 5 microns. Solubility Determination. The de- gassed solvent is passed in a thin film down a glass spiral tube con- taining the solute gas plus the sol- vent vapor at a total pressure of one atm. The volume of gas absorbed is found by difference between the initial and final volumes in the	SOURCE AND PUR 1. Krypton Minimum 2. Octamet General density g cm ⁻³ ESTIMATED ERRO REFERENCES 1.Morrison, J. Chem. 2.Battino, J. Battino, Wilhelm,	A. Matheson Co., Inc. a per cent purity 99.995. hylcyclotetrasiloxane. Electric Co. Distilled of 298.15 K was 0.9500 R: $\delta T/K = 0.03$ $\delta P/mmHg = 0.5$ $\delta X_1/X_1 = 0.01$ T.J.; Billett,F. Soc. 1948, 2033. R.;Evans,F.D.;Danforth,W. Chem.Soc. 1968, 45, 830. R.;Banzhof,M.;Bogan, M.; E.	

COMPONENTS: 1. Krypton; Kr; 7439-90-9 2. Olive Oil H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. August 1978

CRITICAL EVALUATION:

The solubility of krypton in olive oil was measured by Lawrence, Loomis, Tobias and Turpin (1) at 295.15 and 310.15 K, by Yeh and Peterson (2) at 298.15, 303.15, 310.15 and 318.15 K, and at 310.15 K by Masson and Taylor (3) and by Kitani (4).

The data were converted to a mole fraction solubility at a partial pressure of krypton of 101.325 kPa (1 atm) assuming that olive oil is 1,2,3propanetriyl ester of Z-9-octadecenoic acid, or triolein, of molecular weight 885.46. The data from the four laboratories shows considerable scatter. Yeh and Peterson made direct volumetric measurements at atmospheric pressure while the other workers used radiochemical techniques at low krypton partial pressures in the presence of air which can be subject to greater errors than the volumetric method. The data of Yeh and Peterson are internally self-consistent. It was decided to accept the Yeh and Peterson data as the basis of a tentative set of solubility data for krypton in olive oil.

The Yeh and Peterson data were used in a linear regression of a Gibbs energy equation linear in temperature. The tentative values of the thermodynamic changes for the transfer of one mole of krypton from the gas at 101.325 kPa (1 atm) to the hypothetical unit mole fraction solution are

> $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln x_{1} = -4,690.4 + 48.782 T$ Std. Dev. = 5.4, Coef. Corr. = 0.9999 $\Delta H^{O}/J \text{ mol}^{-1} = -4,690.4$, $\Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -48.782$

A table of tentative mole fraction solubility and Gibbs energy values as a function of temperature appears below.

TABLE 1. The solubility of krypton in olive oil. The tentative values of the mole fraction solubility at a krypton partial pressure of 101.325 kPa (1 atm) and the Gibbs energy change as a function of temperature.

т/К	Mol Fraction $X_1 \times 10^2$	$\Delta G^{O}/J \text{ mol}^{-1}$
293.15	1.94	9,610.0
295.15	1.91	9,707.6
298.15	1.88	9,854.0
303.15	1.82	10,098
308.15	1.765	10,341
310.15	1.745	10,439
313.15	1.715	10,586
318.15	1.67	10,830

Continued on next page.

COMPONENTS:	EVALUATOR:
1. Krypton; Kr; 7439-90-9	H. L. Clever Chemistry Department
2. Olive Oil	Emory University Atlanta, GA 30322 U.S.A.
	August 1978

CRITICAL EVALUATION:

Figure 1 shows the per cent deviation of all of the reported mole fraction solubility data from the smoothed data of Yeh and Peterson. Since olive oil is a natural product that may vary somewhat in composition and thus show variation in its solvent capacity, the data sheets on all the workers are included.

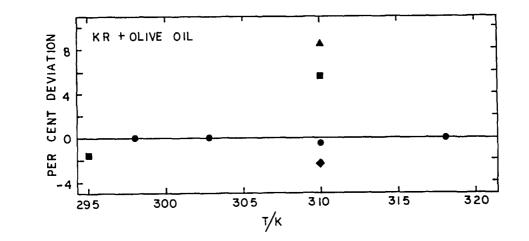


FIGURE 1. Solubility of krypton in olive oil. Percent deviation from regression equation fitted to data of Yeh and Peterson. ● Yeh and Peterson, ■ Lawrence et al., ▲ Masson and Taylor, and ◆ Kitani

REFERENCES

- Lawrence, J.H.; Loomis, W.F.; Tobias, C.A.; Turpin, F.H. J. Physiol 1946, 105, 197.
- 2. Yeh, S.-Y.; Peterson, R.E. J. Pharm. Sci. 1963, 52, 453.
- 3. Masson, M.B.R.; Taylor, K. Phys. Med. Biol. 1967, 12, 93.
- 4. Kitani, K. Scand. J. Clin. Lab. Invest. 1972, 29, 167.

COMPONENTS :			ORIGINAL MEASUR	REMENTS :
1. Krypton; Kr	; 7439-90	0-9	Lawrence, J	. H.; Loomis, W. F.;
2. Olive oil				C. A.; Turpin, F. H.
			J. Physiol.	1946, <u>105</u> , 197-204.
VARIABLES:			PREPARED BY:	
т/к: 29	5 15 - 31	10.15		L. Clever
1/K; 29	5.15 - 51	10.15	А.	L. Cramer
EXPERIMENTAL VALUES	·			
	T/K	Mol Fraction $X_1 \times 10^2$	Bunsen Coefficient α	Ostwald Coefficient L
	295.15 310.15	1.88 1.85	0.44 0.43	0.47 0.49 ⁵
The mole fraction the compiler.	on solub:	ility and Ostw	ald coefficie	nts were calculated by
The molecular w	eight of $\rho = 0.91$	olive oil was 152 - 0.000468	taken to be t/ ^O C (1) for	885 and the density was the mole fraction
See the evaluat	ion cheet	for the solu	bility in oli	ve oil for more
information.	ion sneet			
		AUXILIARY	INFORMATION	
METHOD /APPARATUS,	/PROCEDUI	RE:	SOURCE AND PURI	ITY OF MATERIALS;
Radiochemical m	ethod. 1	No details of	No informat	ion given.
the method give they used an is 34 hours. Poss krypton-79.	otope of	half life		
			ESTIMATED ERRO	R:
			δ	$\alpha/\alpha = 0.05$ (Compiler)
			REFERENCES:	
			Danf	, R.; Evans, F. D.; orth, W. F. <u>Oil Chem</u> . <u>Soc</u> . 1968,

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, S.Y.; Peterson, R.E.
2. Olive Oil (1)	
	J. Pharm. Sci. 1963, <u>52</u> , 453-458.
VARIABLES:	PREPARED BY:
T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K Mol Fraction B	unsen Coefficient Ostwald
$x_{1} \times 10^{3}$	Coefficient α + Std. Dev. L
	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
310.15 17.4	0.4031 ± 0.0025 0.4581
318.15 16.7	0.3844 ± 0.0021 0.4477
coefficients were fitted by the metho log $L = A/T + B$ by the authors. The fats. From the slope and intercept t	same line fitted olive oil and the hey obtained
$\Delta H^{O} = (-1185 \pm 46) \text{ cal mol}^{-1}$ and	$\Delta s^{\circ} = (-5.6 \pm 0.1) \text{ cal } \text{K}^{-1} \text{ mol}^{-1}$
the standard state tranfer on one mol partial pressure of one atm to the hy	pothetical unit mole fraction solution.
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Oil was dried and degassed by stirring under vacuum at 80°C for about 12 hr. A 50 ml. sample was placed in an absorption flask attached to a Geffken gas buret (1). The oil was constantly stirred and equilibrated with increments of gas	 Krypton. Matheson Co., Research grade, maximum impurity 0.04 mole per cent N₂ and Xe. Olive Oil. Magnus, Mabee and Raynard Co., U.S.P.
equilibratea with instances of gue	
until no change was observed in a differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures	
differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures was determined. The authors also	ESTIMATED ERROR:
differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures	$\delta T/K = 0.05$ $\delta P/mmHg = 0.5$
differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures was determined. The authors also measured the viscosity and surface	$\delta T/K = 0.05$
differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures was determined. The authors also measured the viscosity and surface	$\delta T/K = 0.05$ $\delta P/mmHg = 0.5$
differential oil manometer for ½ hr. Difference between initial and final buret readings indicated amount of gas absorbed. Absorption at successively lower temperatures was determined. The authors also measured the viscosity and surface	$\delta T/K = 0.05$ $\delta P/mmHg = 0.5$ $\delta \alpha/\alpha = 0.005$ REFERENCES: 1. Geffken, G. <u>Z. Physik Chem</u> .

COMPONENTS: ORIGINAL MEASUREMENTS: Krypton-85; ⁸⁵Kr; 13983-27-2 Masson, M. B. R.; Taylor, K. 1. Phys. Med. Biol. 1967, 12, 93-98. 2. Olive oil VARIABLES: PREPARED BY: A.L. Cramer т/к: 310.15 EXPERIMENTAL VALUES: Ostwald T/K Mol Fraction Number of Bunsen Coefficient Determinations Coefficient $x_{1} \times 10^{2}$ α + Std Dev L 0.500 0.440 ± 0.004 14 310.15 1.90 The mole fraction solubility and Ostwald coefficient were calculated by the compiler. The molecular weight of olive oil was taken to be 885 and the density was calculated from $\rho = 0.9152 - 0.000468t/^{\circ}C$ (1) for the mole fraction calculation. See the evaluation sheet for the solubility in olive oil for more information. AUXILIARY INFORMATION SOURCE AND PURITY OF MATERIALS: METHOD /APPARATUS/PROCEDURE: Krypton-85. Radiochemical 1. The olive oil was sprayed into a cir-Centre, Amersham, UK. culating mixture of krypton-85 and air. The difference between the 2. Olive oil. No information given. count rate before and after the solvent was sprayed equals the amount absorbed by the olive oil. The measurement was checked by replacing the radioactive gas by air, recir-culating the olive oil and measurement of the increase of radioactivity in the gas phase, which was compared with the original decrease. ESTIMATED ERROR: The sensor was a thallium activated $\delta \alpha / \alpha = 0.03$ (Compiler) sodium iodide crystal, behind a thin beryllium window. REFERENCES: Battino, R.; Evans, F.D. Danforth, W.F. J. Am. Oil Chem. Soc. 1968, 45, 830.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2	Kitani, K.
2. Olive Oil	Scand. J. Clin. Lab. Invest. 1972, 29, 167-172.
	<u>25</u> , 107 172.
VARIABLES:	PREPARED BY:
т/К: 310.15	P.L. Long A.L. Cramer
	A.H. Clamer
EXPERIMENTAL VALUES:	
T/K Mol Fraction Bunsen	Ostwald Number of
$x_1 \times 10^2$ Coeffici	
	L <u>+</u> Std Dev
310.15 1.71 0.39	7 0.451 <u>+</u> 0.015 19
The mole fraction solubility and Bunse the compiler.	en coefficient were calculated by
-	
The molecular weight of olive oil was was calculated from $\rho = 0.9152 - 0.0$ calculation.	00468t/ ^o C for the mole fraction
See the evaluation sheet on olive oil	
see the evaluation sheet on office off	for more information.
<u> </u>	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE;	SOURCE AND PURITY OF MATERIALS:
Glass cuvettes were filled with the	1. Krypton-85. Radiochemical
solvent. One-third was replaced by	Centre, Amersham, UK.
the radioactive gas and air. The sealed cuvette was rotated for two	2. Olive oil. Commercial sample.
hours in a water bath at 37 ⁰ C. The	
total pressure was adjusted to one atm by means of a thin needle.	
Samples from both the liquid and gas	
phase were counted by a scintillation	
detector and a Phillips pulse-height	
analyzer at the energy peak. Cor- rections for self absorption and	
scatter were made.	ESTIMATED ERROR:
	$\delta L/L = 0.03$
	REFERENCES :
	1. Battino, R.; Evans, F.D.;
	Danforth, W.F.
	<u>J. Am. Oil Chem</u> . <u>Soc</u> . 1968, 45, 830.
	<u> </u>

COMPONENTS: 1. Krypton; Kr; 7439-90-9 2. Biological Systems H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. September 1978

CRITICAL EVALUATION:

The solubility of krypton in biological fluids and tissues.

There are several factors that make it difficult to compare and evaluate the solubility of krypton in biological systems. First, the material from biological specimens may show a natural variation in properties which affects the solubility. Second, workers have used quite different experimental techniques to measure the solubility. Some have used classical volumetric methods with the krypton at a partial pressure near atmospheric pressure, many have used radiochemical techniques either with natural krypton tagged with radioactive krypton at a total pressure near atmospheric or with a small unknown partial pressure of radioactive krypton. In neither of the radiochemical techniques is it necessary to know the total pressure to obtain an Ostwald coefficient. However, to compare the results of krypton solubility determinations by the volumetric method and by the radiochemical techniques one must assume the Ostwald coefficient is independent of pressure. This may not be true, especially if the gas associates with one or more components of the biological fluid. In these systems the solubility data are classed as tentative. Below are comments, which compare rather than evaluate, the solubility data in several types of biological systems.

Fat. Yeh and Peterson (1) found little difference in the solubility of krypton in olive oil, human fat, dog fat and rat fat by a volumetric method. Masson and Taylor (2) used a radiochemical method and obtained solubility values that were eight per cent higher in olive oil and three per cent higher in human fat than Yeh and Peterson's results. The Masson and Taylor method, although elegant, appears to be more subject to error than the Yeh and Peterson technique. The results of the two laboratories probably agree within experimental error. Kirk, Parrish and Morken's (3) results with guinea pig fat are reported on a weight basis. They appear to be of similar magnitude to the solubility found in other fats.

Blood and blood components. Several studies showed that the solubility of krypton and other gases varies linearly with the percent of either red blood cells, serum albumin, or hemoglobin in blood and in other fluids. The results of these studies are sometimes extrapolated to 100% blood component to obtain the solubility of the gas in that component. Both Hardewig, Rochester and Briscoe (4) and Kitani (5) report a value of the Ostwald coefficient of krypton in human red blood cells. The values agree within 5 per cent. Yeh and Peterson (1) show that 0.075 mole of krypton associates with a mole of human hemoglobin and that 0.2 to 0.05 mole of krypton associate with a mole of human serum albumin at temperatures of 298.15 and 310.15 K respectively. Muehlbaecher, DeBon and Featherstone (6) carried out qualitative experiments that showed that bovine hemoglobin associates with krypton while bovine gamma-globulin and serum albumin (3) reported the solubility of krypton in dog, cat, hamster and guinea pig blood and Strang (7) reported the solubility of krypton in rabbit blood.

Tissues. The distribution of krypton between the gas phase and the tissue can be measured either with homogenized tissue in a saline or other solution, with solid tissue, or with tissue from an animal sacrificed after breathing air containing krypton. It is likely that the structured tissue interacts somewhat differently with the gas than does the homogenized tissue, but there is not enough data to draw any conclusions about the effect of tissue structure and "solubility". Both Yeh and Peterson (1) and Strang (7) reported on work with rabbit tissues. Kitani (5) reported results with human liver tissues. Kirk, Parrish and Morken (3) reported on a range of guinea pig tissues and guinea pig brain and Yeh and Peterson (1) reported results on beef brain tissues.

COM	PONENTS :	EVALUATOR:
1. 2.	Krypton; Kr; 7439-90-9 Biological Systems	H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A.
		September 1978

CRITICAL EVALUATION:

In addition there are whole blood tissue coefficients for the partition of krypton between blood and tissue determined incidental to regional blood flow studies. These results could be converted into gas-tissue coefficients using the gas-blood Ostwald coefficients. The tissue-blood partition coefficients for krypton are not given in this compilation. Many are summarized by Kirk, Parrish and Morken (3) from the work of Lassen and Munck (8), Lassen and Ingvar (9), Lassen (10, 11), Ingvar and Lassen (12), Glass and Harper (13), Thornburn, Kopald, Herd, Hollenberg, O'Morchoe, and Barger (14), Friedman, Kopald and Smith (15), Bell and Harper (16), Hollenberg and Dougherty (17), Setchell, Waites and Thorburn (18), and Bell and Battersby (19).

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COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, S.Y.; Peterson, R.E.
2. Human Fat	
	<u>J</u> . <u>Pharm</u> . <u>Sci</u> . 1963, <u>52</u> , 453-458.
VARIABLES:	PREPARED BY:
T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES: Human fat 1	Human fat 2
T/K Bunsen Ostwald	T/K Bunsen Ostwald
Coefficient Coefficient <u>a +</u> Std. Dev. L	Coefficient Coefficient <u>a +</u> Std. Dev. L
298.15 0.4412 + 0.0061 0.4816 303.15 0.4258 + 0.0012 0.4725 310.15 0.4071 + 0.0005 0.4626 318.15 0.3878 + 0.0015 0.4516	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$
The Bunsen coefficients are the averag coefficients were fitted by the method log $L = A/T + B$ by the authors. The s fats. From the slope and intercept th	of least squares to the equation ame line fitted olive oil and the ey obtained
$\Delta H^{O} = (-1185 \pm 46)$ cal mol ⁻¹ and Δ	$s^{\circ} = (-5.6 + 0.1) \text{ cal } {K^{-1} \text{ mol}^{-1}}$
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Fat was dried and degassed by stirring under vacuum at 80°C for about 12 hr. A 50 ml. sample was placed in an absorption flask attached to a Geffken gas buret (1). The fat was constantly stirred and equili- brated with increments of gas until no change was observed in a differen- tial oil manometer for ½ hr. Differ- ence between initial and final buret readings indicated amount of gas ab- sorbed. Absorption at successively lower temperatures was determined. The authors also measured the vis- cosity and surface tension of the liquid.	 Krypton. Matheson Co. Research grade, maximum impurity 0.04 mole per cent N₂ and Xe.

	ODTOTNAL MELOWDAY
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2 36	Masson, M.B.R.; Taylor, K.
2. Human Fat	
	Phys. Med. Biol. 1967, 12, 93-98.
VARIABLES: T/K: 310.15	PREPARED BY:
Total P/kPa: 101.325 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES:	n Number of
Coeffic	ient Determinations
<u> </u>	. Dev.
Pooled Fat	
310.15 0.420 <u>+</u> 0	0.006 16
Abdominal Fat	
310.15 0.414 +	0.006 6
AUXII.TARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Liquid fat was sprayed into a circu- lating mixture of ⁸⁵ Kr and air. Dif-	1. Krypton-85. Radiochemical Centre, Amersham, U.K.
ference between count rate in air before and after spraying equals	2. Fat. Abdominal, perirenal and
amount absorbed by fat. Then, radio-	
active gas mixture was replaced by air. The spray pump was re-connected,	2-3 days; pure lipid filtered off and stored under refrigera-
and increase of count rate in air was	
compared with original decrease. Sensor was a B-sensitive thallium	
activated sodium iodide crystal, be-	
hind a thin (0.008 in) beryllium window.	ECTIMATED EDDOD
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS :		ORIGINAL ME	CASUREMENTS:	
1. Krypton; Kr; 7439-90-9		Yeh, S.Y.	.; Peterson,	R.E.
2. Rat-pooled Fat				
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		J. Pharm	. <u>Sci</u> . 1963,	<u>52</u> , 453-458.
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VARIABLES: T/K: 298.15 - 318.	15	PREPARED BY	Y:	
P/kPa: 101.325 (1 at	.m)		H.L. Cleve	er
EXPERIMENTAL VALUES:				
	Bunsen Coe	fficient	Ostwald	-
1/1		-	Coefficient	:
	α <u>+</u> Std. I	Dev.	L	_
298.15	0.4363 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0.4219 + 0		0.4762 0.4755	
310.15	0.4037 +	0.0013	0.4755	
318.15	0.3847 ±	0.0001	0.4481	_
The Bunsen coefficients are	the average	e of three	e measuremer	nts. The Ostwald
coefficients were fitted by log $L = A/T + B$ by the author	the method	of least	squares to	the equation
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$\Delta H^{O} = (-1185 \pm 46)$ cal m	101^{-1} and Δ	$s^{o} = (-5.6)$	6 + 0.1) cal	κ^{-1} mol ⁻¹
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METHOD /APPARATUS/PROCEDURE: Fat was dried and degasse ring under vacuum at 80°C fo 12 hr. A 50 ml. sample was an absorption flask attached Geffken gas buret (1). The constantly stirred and equil with increments of gas until was observed in a differenti manometer for ½ hr. Differe initial and final buret read cated amount of gas absorbed tion at successively lower t tures was determined. The a also measured the viscosity	AUXILIARY ed by stir- or about placed in to a fat was ibrated no change al oil ence between lings indi- d. Absorp- cempera- authors	INFORMATION SOURCE AND 1. Krypt grade mole 2. Rat 1 oment was 0 dried coars tract 308- The 0 for s Store use. ESTIMATEN REFERENCES 1. Geff	N D PURITY OF MAY ton. Mathese e, maximum i per cent Ny retroperitor tal, and hai cut into abo d at 353 K u sely crushed ted with pet 338 K) in a ether was ev several hour ed under ref D ERROR: δT $\delta P/mm$ δc S: ken, G. <u>Z</u> .	TERIALS: son Co. Research impurity 0.04 , and Xe. heal, mesenteric, ir clipped skin but 2.5 cm squares, inder vacuum, 1 and then ex- troleum ether (b.p. Soxhlet extractor. yaporated at 353 K rs under vacuum. Frigeration until T/K = 0.05 hHg = 0.5
METHOD /APPARATUS/PROCEDURE: Fat was dried and degasse ring under vacuum at 80°C fo 12 hr. A 50 ml. sample was an absorption flask attached Geffken gas buret (1). The constantly stirred and equil with increments of gas until was observed in a differenti manometer for ½ hr. Differe initial and final buret read cated amount of gas absorbed tion at successively lower t tures was determined. The a also measured the viscosity	AUXILIARY ed by stir- or about placed in to a fat was ibrated no change al oil ence between lings indi- d. Absorp- cempera- authors	INFORMATION SOURCE AND 1. Krypt grade mole 2. Rat 1 oment was 0 dried coars tract 308- The 0 for s Store use. ESTIMATEN REFERENCES 1. Geff	N D PURITY OF MAY ton. Mathese e, maximum is per cent Ny retroperitor tal, and haid cut into abodd at 353 K us sely crushed ted with pet 338 K) in a ether was even several hour ed under ref D ERROR: δT $\delta P/mm$ δc S:	TERIALS: son Co. Research impurity 0.04 and Xe. heal, mesenteric, ir clipped skin but 2.5 cm squares, inder vacuum, d and then ex- troleum ether (b.p. Soxhlet extractor. yaporated at 353 K is under vacuum. Frigeration until T/K = 0.05 hHg = 0.5 $t/\alpha = 0.005$
METHOD /APPARATUS/PROCEDURE: Fat was dried and degasse ring under vacuum at 80°C fo 12 hr. A 50 ml. sample was an absorption flask attached Geffken gas buret (1). The constantly stirred and equil with increments of gas until was observed in a differenti manometer for ½ hr. Differe initial and final buret read cated amount of gas absorbed tion at successively lower t tures was determined. The a also measured the viscosity	AUXILIARY ed by stir- or about placed in to a fat was ibrated no change al oil ence between lings indi- d. Absorp- cempera- authors	INFORMATION SOURCE AND 1. Krypt grade mole 2. Rat 1 oment was 0 dried coars tract 308- The 0 for s Store use. ESTIMATEN REFERENCES 1. Geff	N D PURITY OF MAY ton. Mathese e, maximum i per cent Ny retroperitor tal, and hai cut into abo d at 353 K u sely crushed ted with pet 338 K) in a ether was ev several hour ed under ref D ERROR: δT $\delta P/mm$ δc S: ken, G. <u>Z</u> .	TERIALS: son Co. Research impurity 0.04 and Xe. heal, mesenteric, ir clipped skin but 2.5 cm squares, inder vacuum, d and then ex- troleum ether (b.p. Soxhlet extractor. yaporated at 353 K is under vacuum. Frigeration until T/K = 0.05 hHg = 0.5 $t/\alpha = 0.005$
METHOD /APPARATUS/PROCEDURE: Fat was dried and degasse ring under vacuum at 80°C fo 12 hr. A 50 ml. sample was an absorption flask attached Geffken gas buret (1). The constantly stirred and equil with increments of gas until was observed in a differenti manometer for ½ hr. Differe initial and final buret read cated amount of gas absorbed tion at successively lower t tures was determined. The a also measured the viscosity	AUXILIARY ed by stir- or about placed in to a fat was ibrated no change al oil ence between lings indi- d. Absorp- cempera- authors	INFORMATION SOURCE AND 1. Krypt grade mole 2. Rat 1 oment was 0 dried coars tract 308- The 0 for s Store use. ESTIMATEN REFERENCES 1. Geff	N D PURITY OF MAY ton. Mathese e, maximum i per cent Ny retroperitor tal, and hai cut into abo d at 353 K u sely crushed ted with pet 338 K) in a ether was ev several hour ed under ref D ERROR: δT $\delta P/mm$ δc S: ken, G. <u>Z</u> .	TERIALS: son Co. Research impurity 0.04 and Xe. heal, mesenteric, ir clipped skin but 2.5 cm squares, inder vacuum, d and then ex- troleum ether (b.p. Soxhlet extractor. yaporated at 353 K is under vacuum. Frigeration until T/K = 0.05 hHg = 0.5 $t/\alpha = 0.005$

COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Yeh, S.Y.; Peterson, R.E.	
2. Dog Fat		
	<u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453-458.	
VARIABLES :	PREPARED BY:	
T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm)	H.L. Clever	
EXPERIMENTAL VALUES:		
T/K Bunsen Coefficient Ostwald Coefficient		
$\underline{\alpha + \text{Std.}}$	Dev. L	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$.0007 0.4581	
The Bunsen coefficients are the average coefficients were fitted by the method	of least squares to the equation	
log L = A/T + B by the authors. The satisfats. From the slope and intercept the	ame line fitted olive oil and the	
$\Delta H^{O} = (-1185 \pm 46) \text{ cal mol}^{-1} \text{ and } \Delta H^{O}$	-	
The thermodynamic values are for the t	ransfer of one mole of krypton from the Le dm ⁻³ to the solution phase at a	
gas phase at a concentration of one mode concentration of one mole dm ⁻³ .	le dm ⁻³ to the solution phase at a	
AUXILIARY INFORMATION		
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
Fat was dried and degassed by stirring under vacuum at 80°C for	 Krypton. Matheson Co. Research grade, maximum impurity 0.04 	
about 12 hr. A 50 ml. sample was placed in an absorption flask attached	mole per cent N_2 and Xe.	
to a Geffken gas buret (1). The fat	2. Dog perineal, mesenteric,	
was constantly stirred and equilibrated with increments of gas until no change	omental, and other adipose fats were extracted with petroleum	
was observed in a differential oil manometer for ½ hr. Difference	ether (b.p. 309-338 K). The ether was evaporated at 353 K	
between initial and final buret read- ings indicated amount of gas absorbed.	under vacuum for several hours. Stored under refrigeration until	
Absorption at successively lower	use,	
authors also measured the viscosity	ESTIMATED ERROR: $\delta T/K = 0.05$	
and surface tension of the liquid.	$\delta P/mmHg = 0.5$ $\delta \alpha / \alpha = 0.005$	
	PEPEPENGNG	
	REFERENCES: 1. Geffken, G. Z. Physik Chem.	
	1904, <u>49</u> , 257.	
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COMPONENTS:		·				
1	- 85	1	1	ORIGINAL MEAS	SUREMENTS:	1
1. Krypton-85	$36^{Kr};$	13983-27-2		Kitani, K.		
2. Paraffin C	Dil					Ì
3. Lecithin						
J. Decitini				Scand. J.	Clin. Lab. Invest.	
				<u>1972, 29</u> ,	167-172.	ł
VARIABLES:				PREPARED BY:		
T/K:	310.15	5		PREPARED BI:	P.L. Long	
P/kPa:	101.32	25 (1 atm)			A.L. Cramer	
_						
EXPERIMENTAL VALU	UES:					
-	Т/К	Bunsen		Ostwald	Replications	
		Coefficient a		efficient Std. Dev.		
-			<u> </u>			
	Paraf	fin Oil				
	310.15	0.424	0.48	1 <u>+</u> 0.019	9	ł
		-	0.49	2*	-	
	Lecit	chin				
	310.15	_	0.37	5*	_	
-						
*Extrapolated	values.	See equati	on be	low.		
The Bunsen coe	efficier	its were calc	ulate	d by the co	mpiler assuming tha	t the
Ostwald coeffi	icient w	as independe	ent of	pressure.		
The solubility	v value	for krypton	in le	cithin is a	value extrapolated	from
the solubility	y of the	e gas in mixt	ures	of paraffin	oil and lecithin.	The
coefficient of	f solubi	lity of the	gas i	s linear in	lecithin per cent	(graph
in the paper).	•					
L =	0.492 -	- (0.00127) (Lecit	hin %w∕v)		
l l						
		••••••••••••••••••••••••••••••••••••••				
		AUX	ILIARY	INFORMATION		
METHOD /APPARA	TUS/PROC		ILIARY		PURITY OF MATERIALS:	
METHOD /APPARA		CEDURE :		SOURCE AND F	URITY OF MATERIALS:	entre .
1	vette is	CEDURE: s filled with	h the	SOURCE AND F		Centre,
A glass cur liquid. One- replaced with	vette is third of radıoad	CEDURE: s filled with f the liquid ctive gas in	the is air.	SOURCE AND F 1. Kryptc Amersh	n. Radiochemical C am, England.	
A glass cur liquid. One- replaced with The sealed cur	vette is third of radioac vette is	CEDURE: s filled with f the liquid ctive gas in s placed in a	the is air.	SOURCE AND F 1. Kryptc Amersh	on. Radiochemical C	
A glass cur liquid. One- replaced with	vette is third of radioac vette is bath for	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. 1	the is air.	SOURCE AND F 1. Kryptc Amersh 2. Paraff	n. Radiochemical C am, England.	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated b pressure is ac means of a th:	vette is third of radioac vette is bath for djusted in need]	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le.	the is air. The	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le	n. Radiochemical C am, England. fin Oil. Commercial	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated b pressure is ac means of a th The radioad	vette is third of radioac vette is bath for djusted in need] ctive as	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct	the is air. The	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le	on. Radiochemical C am, England. fin Oil. Commercial ecithin. Purified t	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated b pressure is ac means of a th:	vette is third of radioac vette is bath for djusted in needl ctive as rption a	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter,	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le	on. Radiochemical C am, England. fin Oil. Commercial ecithin. Purified t	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le	on. Radiochemical C am, England. fin Oil. Commercial ecithin. Purified t	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is a means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t ther and acetone.	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is a means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t ther and acetone.	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t ther and acetone.	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN	n. Radiochemical C am, England. in Oil. Commercial ecithin. Purified t ther and acetone.	quality.
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t other and acetone. RROR:	quality. wice
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is a means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN See s	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t other and acetone. RROR:	quality. wice
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN See s	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t other and acetone. RROR:	quality. wice
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is ad means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN See s	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t other and acetone. RROR:	quality. wice
A glass cur liquid. One- replaced with The sealed cur thermostated I pressure is a means of a th The radioad for self abso made by a scin	vette is third of radioac vette is bath for djusted in needl ctive as rption a ntillati	CEDURE: s filled with f the liquid ctive gas in s placed in a r 2 hours. T to 1 atm by le. ssay, correct and scatter, ion detector	the is air. The ced is	SOURCE AND F 1. Kryptc Amersh 2. Paraff 3. Egg le with e ESTIMATED EN See s	on. Radiochemical C am, England. Fin Oil. Commercial ecithin. Purified t other and acetone. RROR:	quality. wice

COMPONENTS :	ODICINAL MEACUDEATINTS
	ORIGINAL MEASUREMENTS:
1. Krypton-85; ${}^{85}_{36}$ Kr; 13983-27-2	Hardewig, A.; Rochester, D.F.; Briscoe, W.A.
2. Water; H ₂ O; 7732-18-5	
3. Blood and Blood components	
	J. Appl. Physiol. 1960, 15, 723-725.
VARIABLES:	PREPARED BY:
T/K: 310.15	A.L. Cramer
,	
EXPERIMENTAL VALUES: T/K Ostwale	d Number of
Coeffic	lent Determinations
<u>L +</u> Std.	Dev.
Water; H ₂ O; 7732-18-5	
310.15 0.0499 <u>+</u>	0.0013 10
Plasma	
310.15 0.0510 <u>+</u>	0.0010 6
Red Blood Cell	S
310.15 0.0677*	
*Extrapolated val	ue. See equation below.
Twenty measurements of the krypton-85 solubility in whole blood were made at hematocrit of 30 to 65 percent. The data were given in a graph. The regression equation	
L = 0.05199 + (0)	.0001573)(Hcf %)
fitted the data with a regression coe	
AUXILIARY INFORMATION	
ME THOD:	SOURCE AND PURITY OF MATERIALS:
In vitro equilibration at 37 ^O C (310.15 K), 2 hr. Lassen and Munck counting (1).	<pre>1. Krypton-85. Oak Ridge. 10-15 mc cm⁻³ diluted with air to 30 mc cm⁻³.</pre>
APPARATUS/PROCEDURE:	- ESTIMATED ERROR: Standard error of the mean
	is 0.004 for both water and plasma.
	REFERENCES :
	<pre>1. Lassen, T.A.; Munck, O. Acta. physiol. Scandinav. 1955, <u>33</u>, 30.</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2	Kitani, K.
2. Paraffin Oil	
3. Lecithin	
	Scand. J. Clin. Lab. Invest.
	1972, 29, 167-172.
VARIABLES: T/K: 310.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	P.L. Long A.L. Cramer
EXPERIMENTAL VALUES:	
	Ostwald Replications
	efficient
<u>α L +</u>	Std. Dev.
Paraffin Oil	
310.15 0.424 0.48	1 <u>+</u> 0.019 9
- 0.49	2* –
Lecithin	
310.15 - 0.37	5* –
*Extrapolated values. See equation be	low.
The Bunsen coefficients were calculate	
Ostwald coefficient was independent of	pressure.
The solubility value for krypton in le	
the solubility of the gas in mixtures	of paraffin oil and lecithin. The
coefficient of solubility of the gas i in the paper).	s linear in lecitnin per cent (graph
L = 0.492 - (0.00127) (Lecit	hin %w/v)
AUXILIARY	INFORMATION
	SOURCE AND PURITY OF MATERIALS:
METHOD /APPARATUS/PROCEDURE:	
A glass cuvette is filled with the liquid. One-third of the liquid is	1. Krypton. Radiochemical Centre, Amersham, England.
replaced with radioactive gas in air.	
The sealed cuvette is placed in a thermostated bath for 2 hours. The	2. Paraffin Oil. Commercial quality.
pressure is adjusted to 1 atm by	3. Egg lecithin. Purified twice
means of a thin needle.	with ether and acetone.
The radioactive assay, corrected for self absorption and scatter, is	
made by a scintillation detector and	
a Philips pulse-height analyzer.	
	ESTIMATED ERROR:
	See standard deviations above.
	REFERENCES:

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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2	Hardewig, A.; Rochester, D.F.; Briscoe, W.A.
2. Water; H ₂ O; 7732-18-5	
3. Blood and Blood components	
	<u>J. Appl. Physiol. 1960, 15, 723-725.</u>
VARIABLES:	
	PREPARED BY: A.L. Cramer
T/K: 310.15	
EXPERIMENTAL VALUES: T/K Ostwal Coeffic L + Std.	lent Determinations
Water; H ₂ O; 7732-18-5	
310.15 0.0499 <u>+</u>	
_	
Plasma	0.0010
310.15 0.0510 <u>+</u>	0.0010 6
Red Blood Cell	S
310.15 0.0677*	······································
*Extrapolated val	ue. See equation below.
Twenty measurements of the krypton-85 solubility in whole blood were made at hematocrit of 30 to 65 percent. The data were given in a graph. The regression equation	
L = 0.05199 + (0)	.0001573)(Hcf %)
fitted the data with a regression coe	
AUXILIARY INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:
In vitro equilibration at 37 ^O C	1. Krypton-85. Oak Ridge. 10-15
(310.15 K), 2 hr. Lassen and	mc cm ⁻³ diluted with air to -3
Munck counting (1).	30 mc cm^{-3} .
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
	Standard error of the mean is 0.004 for both water and plasma.
	REFERENCES :
	<pre>1. Lassen, T.A.; Munck, O. Acta. physiol. Scandinav. 1955, <u>33</u>, 30.</pre>

CONDOURNER .			
COMPONENTS: 1. Krypton; Kr; 7439-90-9	ORIGINAL MEASUREMENTS: Muehlbaecher, C.; DeBon, F.L.;		
2. Water; H ₂ O; 7732-18-5	Featherstone, R.M.		
2			
3. Sodium Phosphate Buffer			
4. Bovine Blood Components			
	<u>Inst. Anesth</u> . <u>Clinics</u> 1963, <u>1</u> , 937-952.		
VARIABLES:	PREPARED BY:		
T/K: 310.15	H.L. Clever		
EXPERIMENTAL VALUES:			
The Bunsen coefficients were presented on large scale graphs. The krypton Bunsen coefficient in sodium phosphate buffer was about 0.056. Comments about the individual systems follow:			
T/K Comments			
	at a Duffer (all 6 2 6 5 Tonic		
Bovine Gamma-Globulin + Phosph Strength 0.16)	ate Buffer (pH 6.3-6.5, 10n1C		
	310.15 No apparent change in krypton Bunsen coefficient as bovine gamma-globulin was increased from 0-8 per cent.		
Bovine Serum Albumin + Phospha Strength 0.16)	te Buffer (pH 5.6-6.3, Ionic		
the 8 per cent uncertanity	-		
Bovine Hemoglobin + Phosphate : 0.16)	Buffer (pH 6.3-6.6, Ionic Strength		
310.15 The krypton Bunsen coefficient appears to increase about 12 per cent as the bovin hemoglobin was increased from 0 to 20			
per cent.			
AUXILIARY	INFORMATION		
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
Gas chromatography	No information		
	POTIMATED EDDOD.		
• •	ESTIMATED ERROR:		
	$\delta \alpha / \alpha = 0.08$		
	REFERENCES:		

20VD 000000	
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, S-Y.; Peterson, R.E.
<pre>2. Water; H₂O; 7732-18-5</pre>	
3. Human Whole Blood and Blood	
Components	J. Appl. Physiol. 1965, 20, 1041
VARIABLES:	PREPARED BY:
T/K: 310.15	A.L. Cramer
Total P/kPa: 101.325 (1 atm)	
EXPERIMENTAL VALUES:	
T/K Absorption Coefficient	Number of Absorption Determinations Coefficient*
mean β + Std. Dev.	g ⁻¹ Hemoglobin
,	g Hemoglobin
Hemoglobin Solution (7.5%	hemoglobin, 92.27% water,
$1.72 \text{ mg cm}^{-3} \text{ lipid}$	
310.15 0.0444	1 0.0346
Hemoglobin Solution (15.3	9% hemoglobin, 84.60% water,
$2.50 \text{ mg cm}^{-3} \text{ lipid}$	
310.15 0.0420 + 0.0018	3 0.0214
	blood + 120 ml 1.32% sodium
310.15 0.0455 <u>+</u> 0.0044	6 –
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
In Yeh and Peterson (1) modification	1. Krypton. The Matheson Co. Re-
of Geffcken (2) apparatus, 45 ml. of	<pre>search grade, maximum impurity 0.04% nitrogen and/or oxygen.</pre>
liquid was frozen, evacuated, and melted repeatedly until no bubbles	2. Human blood. 425 ml. from a
appeared in liquid under vacuum.	normal donor, mixed with 120 ml. 1.32% sodium citrate solution.
Equilibration with gas and measurement of solubility followed (1).	Frozen and thawed to hemolyze
of solubility for owed (1).	red blood cells. 3. Hemoglobin. From centrifuged
	citrated human blood.
	ESTIMATED ERROR: $\delta T/K = 0.05$
	$\delta P/mmHg = 0.2$
	$\delta L/L = 0.0015$
	REFERENCES: 1. Yeh, S-Y.; Peterson, R.E.
	11. Yeh, S-Y.; Peterson, R.E.
	J. Pharm. Sci. 1963, 52, 453.
	<u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453. 2. Geffcken, G.
	<u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453. 2. Geffcken, G. <u>Z. Physik. Chem</u> .
	<u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453. 2. Geffcken, G.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2	Kitani, K.
	Kitani, K.
 Water, Saline Solution, Plasma, and Human Red Blood Cells 	
	<u>Scand. J. Clin. Lab. Invest.</u> 1972, <u>29</u> , 167-172.
VARIABLES:	PREPARED BY:
T/K: 310.15 P/kPa: 101.325 (1 atm)	P.L. Long A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Bunsen	Ostwald Replications
$\begin{array}{ccc} \text{Coefficient} & \text{Coefficient} \\ \alpha & \text{L} \end{array}$	Coefficient + Std. Dev.
Water; H ₂ O; 7732-18-5	· · · · · · · · · · · · · · · · · · ·
310.15 0.0424 0.0	0481 <u>+</u> 0.0022 17
- Water + Sodium Chloride; NaCl; 7647-14-5 0.9 per cent Saline	
310.15 0.403 0.0	0458 + 0.0020 16
Plasma (3 Samples)	_
310.15 0.0442 0.0	0502 <u>+</u> 0.0002 8
0.0435 0.0	
Human Red Blood Cells	3
310.15 - 0.0	0718 -
The Bunsen coefficients were calculated by the compiler assuming that the Ostwald coefficient was independent of pressure.	
The solubility value for red blood cells is a value extrapolated from the solubility of the gas in mixtures of plasma and heparinized blood from healthy donors. The coefficient of solubility is linear in hematocrit per	
cent (graph in paper). $L = 0.04961 +$	(0.0002223) (Hematocrit %v/v)(r=0.975)
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS;
A glass cuvette is filled with the liquid. One-third of the liquid is	 Krypton. Radiochemical Centre, Amersham, England.
replaced with radioactive gas in air. The sealed cuvette is placed in a thermostated bath for 2 hours. The pressure is adjusted to 1 atm by means of a thin needle. The radioactive assay, corrected for self absorption and scatter, is made by a scintillation detector and a Philips pulse-height analyzer.	 Water and 0.9 per cent saline were prepared according to the criteria for purity in the Nordic Pharmacopeia. Heparinized blood from healthy donors was used.
	ESTIMATED ERROR:
	See standard deviations above.
	REFERENCES:

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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2 36	Kirk, W.P.; Parish, P. W.; Morken,D.A.
2. Blood of Various Animals	
	<u>Health Phys. 1975, 28, 249 - 261.</u>
VARIABLES:	PREPARED BY:
T/K: 308.65 - 312.15 P/kPa: 101.325 (1 atm)	A. L. Cramer
EXPERIMENTAL VALUES:	
	efficient Number of . Dev. Determinations
Dog blood	
308.65 0.0691 <u>+</u>	0.0054 9
Chinese hamster	blood
310.15 0.0822 ±	0.0014 10
Cat blood	
309.15 0.0595 ±	0.0065 7
312.15 0.0559 ±	0.0040 8
Guinea pig blood	1
309.15 0.0546 + 310.15 0.0538 ±	
312.25 0.0513 ±	0.0041 8
N,N'-1,2-ethaned	liyl-bis(N-carboxymethyl)glycine etetraacetic acid or EDTA);C ₁₀ H ₁₆ N ₂ O ₈ ;
60-00-4. A 10 %	solution in water.
310.15 0.0406 ±	0.0028 8
Sodium chloride;	NaCl; 7647-14-5.Aqueous soln.0.9 wt.8
310.15 0.0472 ±	0.0012 4
The authors conversion of their expe ent assumed that Henry's law is obeyed	erimental data to the Ostwald coeffici- and the Ostwald coefficient is
independent of pressure.	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
The blood was obtained by veni- puncture (cats, dogs),cardiac puncture (guinea pigs) or intraorbital sinus	1. Krypton. No information given. The 85 Kr + air mixture had a count of 0.9 µCi cm ⁻³ .
puncture (Chinese hamsters). The blood was mixed with a "known volume"	2. Guinea pigs. Duncan-Hartley random
of 10 % EDTA to prevent clotting.	bred. 700-1000 g, from commercial
The samples were equilibrated with a ⁸⁵ Kr + air atmosphere for 24 hours;	suppliers or bred in laboratory.
samples were counted in a NaI well	
system. The solubility coefficients were corrected for the presence of	
aqueous saline and EDTA solution used	
as diluents. APPARATUS/PROCEDURE:	ESTIMATED ERROR:
	$\delta L/L = 0.02 - 0.14$
The authors fitted the Ostwald coefficients in Guinea pig blood to the equation	
•	REFERENCES:
log L = -4.1378 + 889.2/T (r = 0.994)	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton; Kr; 7439-90-9	Yeh, SY.; Peterson, R. E.
2. Water; H ₂ O; 7732-18-5	J. Appl. Physiol. 1965, 20, 1041-1047.
3. Sodium Chloride; NaCl; 7647-14-5	
4. Human Albumin; 9048-46-8	
VARIABLES: T/K: 298.15 - 310.15 P/kPa: 101.325 (1 atm) Albumin/wt %: 5.2 - 25.3	PREPARED BY: A. L. Cramer H. L. Clever

EXPERIMENTAL VALUES:

T/K	Albumin	Mol Fraction	Bunsen	Ostwald Coefficient	Number of
	wt %	$x_1 \times 10^3$	Coefficient a	L ± Std. Dev.	Determin- ations.
298.15	5.2		0.0503	0.0549 ± 0.0008	6
303.15			0.0446	0.0495 ± 0.0008	6 6 5
310.15			0.0380	0.0431 ± 0.0008	5
298.15	15.4		0.0504	0.0550 ± 0.0023	5
303.15			0.0437	0.0485 ± 0.0015	5 5 5
310.15			0.0358	0.0406 ± 0.0018	5
298.15	25.3		0.0507	0.0553 ± 0.0006	3
303.15			0.0427	0.0474 ± 0.0009	3
310.15			0.0336	0.0381 ± 0.0007	3
298.15	100	161.1	0.0572	0.0624	
303.15		108.7	0.0371	0.0412	
310.15		48.5	0.0172	0.0195	

The Ostwald coefficients in 100 % human albumin were values extrapolated from the values at lower concentration by the authors. The Bunsen coefficients and the mole fraction solubilities were calculated by the compiler. The authors used an albumin molecular weight of 69,000 and a density of 1.0 to calculate the mole ratio of krypton to albumin of 0.192, 0.122, and 0.051 at 298.15, 303.15, and 310.15 K, respectively.

AUXILIARY	INFORMATION
METHOD: A 45 cm ³ sample of albumin in standard saline solution was frozen, evacuated, and melted repeatedly until no bubbles appeared in the liquid under vacuum in the Yeh and peterson modification (1) of the Geffcken apparatus (2). Equil- ibration with gas and measurement of the solubility followed.	 SOURCE AND PURITY OF MATERIALS: 1. Krypton. The Matheson Co. Research grade with maximum impurity of 0.04 % N₂ and O₂. 2. Serum albumin solution. Cutter Laboratories. A 25 % solution stabilized with 0.02 M sodium caprylate and 0.02 M sodium acetyltryptophanate.
APPARATUS/PROCEDURE:	ESTIMATED ERROR: δT/K = 0.05 δP/mmHg = 0.2 δL/L = 0.0015 REFERENCES: 1. Yeh, SY.; Peterson, R. E. <u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453. 2. Geffcken, G. <u>Z. Phys. Chem</u> . 1904, <u>49</u> , 257.

	5; ⁸⁵ Kr; 13983- 36 ssues		RIGINAL MEASUREMENTS	:
		P	hys. Med. Biol.]	.975, <u>20</u> , 1025-1028.
	310.15	(PREPARED BY:	
P/kPa: Time/hr:	P/kPa: 101.325 (1 atm) Time/hr: 0.5 - 24		A.L. Cramer	
EXPERIMENTAL VALU	JES:		<u> </u>	
T/K	Tissue	Bunsen Coefficien α	Ostwald it Coefficient L <u>+</u> Std. Dev.	Number of Replications
310.15	Erythrocytes	0.094	0.107 ± 0.009	32
	Plasma	0.052	0.059 <u>+</u> 0.005	32
	Whole Blood	0.067	0.076 <u>+</u> 0.007	32
	Vitreous Body	0.052	0.059 <u>+</u> 0.008	28
	Retina	0.055	0.062 ± 0.011	35
	Choroid Layer	0.026	0.030 <u>+</u> 0.008	44
	Sclera	0.024	0.028 <u>+</u> 0.006	46
		AUXILIARY I	NFORMATION	
Anderson (1), rubber stoppe was equilibra 310.15 K for 24 hours. Ra mined in a we for tissue sa sample + gas tion. The up significantly libration. T	of Ladefoged a modified to ex rs, was used. ted with ⁸⁵ Kr a 0.5, 1, 2, 3, 4 dioactivity was 11 scintillatic mples alone and at the end of e take of gas did with the time ransfer loss wa	and clude Tissue t , 5, and s deter- on counter l for equilibra- l not vary of equi- as less	SOURCE AND PURITY OF 1. Krypton. No 2. Choroid, ret: Freshly enuc: under saline 0.05 g sample	information given. ina, and sclera. leated eyes dissected to obtain 0.015 -
The method Anderson (1), rubber stoppe was equilibra 310.15 K for 24 hours. Ra mined in a we for tissue sa sample + gas tion. The up significantly	modified to ex rs, was used. ted with ⁸⁵ Kr a 0.5, 1, 2, 3, 4 dioactivity was 11 scintillatic mples alone and at the end of e take of gas did with the time ransfer loss wa	and clude Tissue t , 5, and s deter- on counter l for equilibra- l not vary of equi- as less	SOURCE AND PURITY OF 1. Krypton. No 2. Choroid, ret: Freshly enuc: under saline	information given. ina, and sclera. leated eyes dissected to obtain 0.015 - es.

COMPONENTS : ORIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 Yeh, S-Y.; Peterson, R.E. 2. Water; H₂O; 7732-18-5 Sodium chloride; NaCl; 7647-14-5 3. J. Appl. Physiol. 1965, 20, 1041-1047. 4. Rabbit leq muscle VARIABLES: PREPARED BY: T/K: 298.15 - 310.15 P/kPa: 101.325 (1 atm) A.L. Cramer **EXPERIMENTAL VALUES:** T/K Number of cm³ Kr Absorption Coefficient Determinations a⁻¹ muscle* mean β + Std. Dev. $\begin{array}{c} 0.0549 \ + \ 0.0015 \\ 0.0501 \ + \ 0.0010 \\ 0.0439 \ + \ 0.0010 \end{array}$ 4 298.15 303.15 4 0.0405 - 0.0423310.15 4 *Calculated by the authors. They corrected for dilution with saline solution and assumed a muscle specific gravity of 1.07. The range of values reflects the range of lipid, water, and protein found by analysis of their samples. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: 1. Krypton. The Matheson Co. In Yeh & Peterson (1) modification of Research grade, maximum impurity Geffcken (2) apparatus, 45 ml of 0.04% nitrogen and/or oxygen. liquid is frozen, evacuated, and melted repeatedly until no bubbles Rabbit leg muscle, homogenized 2. with 4x its volume normal saline, appeared in liquid under vacuum. and 0.05% "mercury chloride" Equilibration with gas and measure-ment of solubility followed (1). added as microbial poison. ESTIMATED ERROR: $\delta T/K = 0.005$ $\delta P/mmHg = 0.2$ $\delta L/\bar{L} = 0.05$ **REFERENCES**: Yeh, S-Y.; Peterson, R.E. 1. J. Pharm. Sci. 1963, 52, 453. 2. Geffcken, G. Z. Physik Chem. 1904, 49, 257.

					
COMPONENTS	85		ORIGINAL MEASUREMENTS:		
1. Krypton; ⁸⁵ Kr; 13983-27-2		2	Kirk, W.P.; Parish, P.W.; Morken, D.A.		
2. Gui	nea Pig Tissues				
			Health Phys. 1975, 28, 249-261.		
VARIABLES	:		PREPARED BY:		
T/K: 310.15 P/kPa: 101.325 (1 atm)			A.L. Cramer		
P					
EXPERIMEN	TAL VALUES: OF				
TABLE.	In vivo ^{ob} Kr weight p	partition	coefficients for guinea pig tissues.		
T/K	Tissue	Number o			
		Samples	$L_w + Std. Dev. L_w + Std. Dev.$		
310.15	Omental fat	17	0.391 + 0.059 $0.421 + 0.064$		
	Subcutaneous fat	16	- $ -$		
	Lungs (see note (l))	4	0.240 ± 0.088 0.274 ± 0.166		
	Thymus	6	- $ -$		
	Lymph nodes	8	0.126 ± 0.064 0.138 ± 0.075		
	Bone marrow	15	0.113 ± 0.093 0.134 ± 0.119		
i	Adrenals	18	0.0939 ± 0.0318 0.102 ± 0.038		
	Thyroid	9	0.0799+ 0.0313 0.0829+ 0.0373		
	Liver	9	0.0713+ 0.0214 0.0768+ 0.0281		
	Large intestine	9	0.0734 ± 0.0402 0.0744 ± 0.0423		
	Small intestine	9	0.0715+ 0.0384 0.0722+ 0.0391		
		AUXILIARY	INFORMATION		
METHOD /A	PPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS;		
The	guinea pig is enclosed ed air with ⁸⁵ Kr for 6	lin	1. Krypton. No information given.		
			The ⁸⁵ Kr + air mixture had a		
15 min albumin	before sacrifice, ¹³¹ I (2) is injected to in	-tagged dicate	count of 0.9 μ Ci cm ⁻³ .		
the amo	unt of blood in the ti	.ssue.	2. Guinea pigs. Duncan-Hartley		
	ce, necropsy, and radi t ⁸⁵ Kr level and ¹³¹ I		random bred. 700-1000 g, from		
determi	ne the uptake of gas i	level .n the	commercial suppliers or bred in laboratory.		
tissue.					
			ESTIMATED ERROR:		
1					
			$\delta L/L = 0.13$ (blood) - 0.89 (bone marrow)		
			REFERENCES:		
			 Glass, H.I.; Harper, A.M. <u>Phys. Med. Biol</u>. 1962, <u>7</u>, 335. 		
			 McCall, M.S.; Camp, M.F. J. <u>Lab</u>. <u>Clin</u>. <u>Med</u>. 1961, <u>58</u>, 772. 		

COMPONENTS			ORIGINAL MEASUREMENTS:
1. Kry	pton; ⁸⁵ Kr; 13983-27-2		Kirk, W.P.; Parish, P.W.; Morken, D.A.
2. Gui	nea Pig Tissues		
	-		Weelth Diver 1075 00 040 061
			<u>Health</u> Phys. 1975, <u>28</u> , 249-261.
VARIABLES	:		PREPARED BY:
T/K: 310.15 P/kPa: 101.325 (1 atm)		<u>۱</u>	A.L. Cramer
EXPERIMEN	TAL VALUES: 85		coefficients for guinea pig tissues.
$\frac{\text{TABLE}}{\text{T/K}}$	In vivo Kr weight p	Number of	coefficients for guinea pig tissues.
T/K	Tissue	Samples	$L_{W} + Std. Dev. L_{W} + Std. Dev.$
310.15	Testes	10	$0.0578 \pm 0.0154 0.0579 \pm 0.0160$
	Ovaries	9	$0.0571 \pm 0.0129 0.0574 \pm 0.0137$
	Blood (see note (2))	10(23	3) 0.0567 <u>+</u> 0.0073
	Kidneys	14	0.0455 <u>+</u> 0.0160 0.0430 <u>+</u> 0.0188
	Uterus	4	0.0426 ± 0.0125 0.0418 ± 0.0127
	Stomach	10	0.0420 <u>+</u> 0.0191 0.0415 <u>+</u> 0.0206
	Brain	19	$0.0410 \pm 0.0162 0.0405 \pm 0.0167$
2	Eyes (whole)	8	0.0404 ± 0.0127 0.0402 ± 0.0128
	Muscle	15	$0.0402 \pm 0.0169 0.0396 \pm 0.0173$
	Seminal vesicles	2	$0.0374 \pm 0.0066 0.0369 \pm 0.0068$
	Spleen	9	$0.0352 \pm 0.0144 0.0365 \pm 0.0090$
	Heart	8	$0.0347 \pm 0.0129 0.0300 \pm 0.0148$
Note:	(2) Weighted average from 1 to 3. Th		umber of samples per animal ranged number of samples is in parentheses.
		AUXILIARY	INFORMATION
METHOD /A	PPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
See pre	ceeding page.		See preceeding page.
-			
			ESTIMATED ERROR:
			See preceeding page.
			REFERENCES:
			See preceeding page.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Krypton-85; ⁸⁵ Kr; 13983-27-2	Kitani, K.; Winkler, K.
2. Human Liver Tissue	
	<u>Scand. J. Clin. Lab. Invest</u> . 1972, <u>29</u> , 173-176.
VARIABLES:	PREPARED BY:
T/K: 310.15	A.L. Cramer
EXPERIMENTAL VALUES:	
Thirty three measurements of the solub liver tissue with triglyceride content per cent. One measurement was made at The results were given in a graph. The equation	varying between 1 and 20 weight 50 weight percent triglyceride.
L = 0.04924 + (0.00407)	2)(triglyceride wt %)
with a regression coefficient of 0.98	
The triglyceride weight per cent was tissue solubility was corrected for th a liver triglyceride content of 5 per 0.7 per cent, at higher triglyceride and reaches a value of 5 per cent at 2	ne water added to the sample. Below cent the standard deviation was content the standard error increases,
Tripalmitin is hexadecanoic acid, 1,2 555-44-2.	,3-propanetriyl ester; C ₅₁ H ₉₈ O ₆ ;
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Five g of liver tissue was homo- genized at 277 K for 15 m after addi-	 Krypton-85. Radiochemical Centre, Amersham, U.K.
tion of 5 cm ³ of water. A glass cuvette $(1 \times 1 \times 10 \text{ cm})$ was 2/3 filled with the homogenate, and closed with a rubber stopper. The space above the homogenate was evacuated and filled with air con- taining krypton-85. The cuvette was rotated for 2 h in a water bath at 310 K. The radioactivity in the	2. Liver tissue. Autopsy material.
homogenate and in the air phase were determined by a scintillation	ESTIMATED ERROR:
counter placed in a thermostated box at 310 K (1).	
The triglyceride was determined enzymatically in chloroform-methanol	
extracts.	REFERENCES :
	l. Kitani, K. <u>Scand. J. Clin. Lab. Invest</u> . 1972, <u>29</u> , 167.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Krypton; Kr; 7439-90-9 Yeh, S-Y; Peterson, R.E. 2. Water; H₂O; 7732-18-5 3. Sodium chloride, NaCl; 7647-14-5 J. Appl. Physiol. 1965, 20, 1041-1047. Beef brain 4 VARIABLES: PREPARED BY: T/K: 298.15 - 310.15 A.L. Cramer P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: cm³ Kr Number of T/K Absorption Coefficient Determinations q⁻¹ muscle* mean β + Std. Dev. $\begin{array}{c} 0.0572 \ \pm \ 0.0017 \\ 0.0517 \ \pm \ 0.0020 \\ 0.0454 \ \pm \ 0.0020 \end{array}$ 298.15 3 303.15 3 310.15 3 0.066 - 0.072*Calculated by the authors. They corrected for dilution with saline solution and assumed a brain specific gravity of 1.04. The range of values reflects the range of lipid, water, and protein content found by analysis of their samples. AUXILIARY INFORMATION METHOD SOURCE AND PURITY OF MATERIALS: Krypton. The Matheson Co. In Yeh and Peterson (1) modification 1. Research grade; maximum impurity of Geffcken (2) apparatus, 45 ml of 0.04% nitrogen and/or oxygen. liquid homogenate is frozen, evacuated, and melted repeatedly until no 2. Beef brain. Homogenized with bubbles appear in liquid under vacuum. 4 x volume normal saline (w/w); then mixed with 0.05% "mercury Equilibration with gas and measurechloride" added as microbial ment of solubility follow (1). poison. ESTIMATED ERROR: $\delta T/K \approx 0.05$ $\delta P/mmHg = 0.2$ $\delta L/L = 0.05$ **REFERENCES:** 1. Yeh, S-Y.; Peterson, R.E. J. Pharm. Sci. 1963, 52, 453. 2. Geffcken, G. Z. Physik Chem. 1904, 49, 257.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Krypton; ⁸⁵ Kr; 13983-27-2	Kirk, W.P.; Parish, P.W.; Morken,D.A.
2. Water; H ₂ O; 7732-18-5	
3. Sodium Chloride; NaCl; 7647-14-5	<u>Health</u> Phys. 1975, <u>28</u> , 249-261.
4. Guinea Pig Brain	
VARIABLES: T/K: 310.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES:	
,	vald coefficient Number of L <u>+</u> Std. Dev. Determinations
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Brain samples were obtained and homogenized under aseptic conditions and diluted 4:1 with sterile 0.9% saline. Penicillin (200 units/ml) and streptomycin (100µg/ml) were added as antibacterial agents. Solubility for 20% brain homogenate in normal saline was determined and Ostwald coefficient for brain was calculated from that value.	 Krypton. No information given. The ⁸⁵Kr + air mixture had a count of 0.9 μCi cm⁻³. Guinea pigs. Duncan-Hartley random bred. 700-1000 g, from commercial suppliers or bred in laboratory.
	ESTIMATED ERROR: $\delta L/L = 0.36$ (brain) $\delta L/L = 0.025$ (saline)
	REFERENCES :

COMPONENTS: 1. Xenon; Xe; 7440-63-3 2. Water; H₂O; 7732-18-5 Water; H₂O; 7732-18-5 University, Dayton, Ohio, 45435 U.S.A. July 1978

CRITICAL EVALUATION:

The experimental solubility data of three workers was considered to be of sufficient reliability to use in the smoothing equation. In the process of fitting the data to the smoothing equation any data points which differed from the smooth equation by about two standard deviations or more were rejected. The 20 points used for the final smoothing were obtained as follows (reference - number of data points used from that reference): 1-3; 2-4; 3-11; 4-1; 5-1. The fitting equation used was

 $\ln x_1 = A + B/(T/100K) + C \ln (T/100K) + DT/100K$ (1)

Using T/100K as the variable rather than T/K gives coefficients of approximately equal magnitude. The best fit for the 20 data points was

 $\ln x_{1} = -74.7398 + 105.210/(T/100K) + 27.4664 \ln (T/100K)$ (2)

where x_1 is the mole fraction solubility of xenon at 101,325 Pa partial pressure of gas. The fit in $\ln x_1$ gave a standard deviation of 0.35% taken at the middle of the temperature range. Table 1 gives smoothed values of the mole fraction solubility at 101,325 Pa partial pressure of gas and the Ostwald coefficient at 5K intervals.

Table 1 also gives the thermodynamic functions $\Delta \overline{G}_{1}^{\circ}$, $\Delta \overline{H}_{1}^{\circ}$, $\Delta \overline{S}_{1}^{\circ}$, and $\Delta \overline{C}_{p}^{\circ}$ for the transfer of gas from the vapor phase at 101,325 Pa partial gas pressure to the (hypothetical) solution phase of unit mole fraction. These thermodynamic properties were calculated from the smoothing equation according to the following equations:

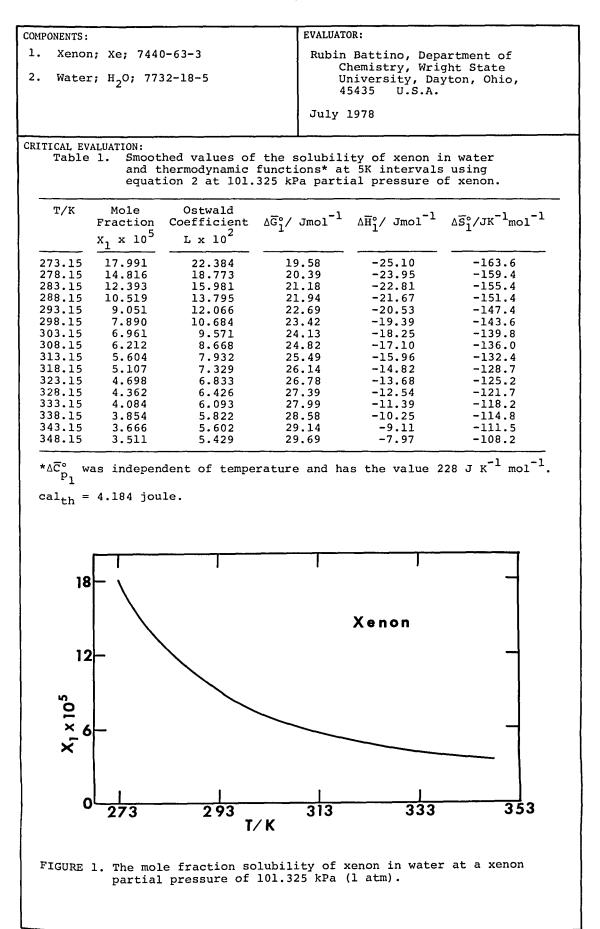
 $\Delta \overline{G}_{1}^{\circ} = -RAT - 100RB - RCT \ln (T/100) - RDT^{2}/100$ (3) $\Delta \overline{S}_{1}^{\circ} = RA + RC \ln (T/100) + RC + 2RDT/100$ (4) $\Delta \overline{H}_{1}^{\circ} = -100RB + RCT + RDT^{2}/100$ (5) $\Delta \overline{C}_{p_{1}}^{\circ} = RC + 2RDT/100$ (6)

The results from five other laboratories were rejected for several reasons. Antropoff's data (6) were very high - being off by as much as 40%. On the other hand, König's data (7) were consistently low by 8 to 22 per cent. Steinberg and Manowitz (8) only crudely measured the solubility and their single value was 6% high. Eucken and Hertzberg's two measurements (9) were both very high (5 to 30%). Wood and Caputi's measurements (10) ranged from 12% high to 3% low although their stated precision was 0.5%.

Figure 1 shows the temperature dependence of the solubility of xenon in water. The curve was obtained from the smoothing equation. There is no minimum in the range of the measurements, but the solubility curve flattens out markedly at the higher temperatures. The ln X equation minimum is 383 K.

Alexander (11) made five calorimetric determinations of the xenon enthalpy of solution in water at 298.15 K. He obtained an enthalpy of solution of -17.2 ± 0.5 kJ mol⁻¹ which is 11% below the value derived from the temperature coefficient of the solubility values. We have found no reports of the partial molal volume of xenon in water.

Ewing and Ionescu (12) determined Henry's constant of xenon in water at three temperatures. Their value at 288.15 K agrees with the recommended value, but their values at 278.15 and 298.15 K are 11.5 and 5 per cent high, respectively.



COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Xenon; Xe; 7440-63-3	Morrison, T. J.; Johnstone, N. B.	
	J. Chem. Soc.	
2. Water; H ₂ O; 7732-18-5	$\overline{1}95\overline{4}, \ \overline{3}44\overline{1} - \ \overline{3}443.$	
ARIABLES:	PREPARED BY:	
T/K: 285.85 - 344.85	R. Battino	
XPERIMENTAL VALUES:		
	raction Kuenen	
x	x 10 ⁵ Coefficient	
1	s _o x 10 ³	
	.896 135.5	
	.943 123.6 .742 121.1	
	.928 110.9	
	.821 84.5	
	.613* 69.3 .493 67.8	
	.493 67.8	
332.15 4	.150* 50.8	
344.85 3	.604* 43.8	
	of 101.325 kPa. in the final smoothing equation for the n in the critical evaluation.	
*Solubility values which were used	in the final smoothing equation for th	
*Solubility values which were used recommended solubility values give	in the final smoothing equation for th	
*Solubility values which were used recommended solubility values give AUXILL	in the final smoothing equation for th n in the critical evaluation.	
*Solubility values which were used recommended solubility values give AUXILL ÆTHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume	in the final smoothing equation for the n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company,	
Solubility values which were used recommended solubility values give AUXILL ETHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets.	in the final smoothing equation for th n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1%	
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Solubility values which were used recommended solubility values give AUXILL ETHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1.	in the final smoothing equation for the n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton.	
Solubility values which were used recommended solubility values give AUXILL ETHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1.	<pre>in the final smoothing equation for th n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton. 2. Water-no comments by authors.</pre>	
Solubility values which were used recommended solubility values give AUXILIA ETHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1. PPARATUS/PROCEDURE: Apparatus of Morrison and Billet	in the final smoothing equation for the n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton. 2. Water-no comments by authors. ESTIMATED ERROR:	
*Solubility values which were used recommended solubility values give AUXILI. METHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1. APPARATUS/PROCEDURE: Apparatus of Morrison and Billet used. See ref. 1. The authors use	in the final smoothing equation for the n in the critical evaluation. NRY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton. 2. Water-no comments by authors. ESTIMATED ERROR:	
*Solubility values which were used recommended solubility values give AUXILL METHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1. APPARATUS/PROCEDURE: Apparatus of Morrison and Billet used. See ref. 1. The authors use the smoothing equation	in the final smoothing equation for the n in the critical evaluation. ARY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton. 2. Water-no comments by authors. ESTIMATED ERROR: t d REFERENCES:	
*Solubility values which were used recommended solubility values give AUXILLA METHOD: Flowing the previously degassed liquid in a thin film through the g in an absorption spiral. Volume changes are measured in burets. See ref. 1. APPARATUS/PROCEDURE: Apparatus of Morrison and Billet	in the final smoothing equation for the n in the critical evaluation. NRY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-British Oxygen Company, Ltd. Contained about 1% krypton. 2. Water-no comments by authors. ESTIMATED ERROR:	

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COMPONENTS :		ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3		Yeh, S-Y.; Peterson, R. E.
2. Water; H ₂ O; 7732-18-5		J. Pharm. Sci. 1964, 53, 822 - 824.
		<u></u> , <u></u> _
VARIABLES:		PREPARED BY:
π/ν , 200 15 - 210 15		D. Detter
T/K: 298.15 - 318.15		R. Battino
EXPERIMENTAL VALUES:		L
	T/K Mol Frad	ction Ostwald
	x ₁ x 2	10 ⁵ Coefficient
		L
		87* 0.1068 68* 0.0958
303.15 6:96 310.15 5.89		93 0.0827
	318.15 5.1	36* 0.0737
The mole fraction so	lubility at 101	325 Pa (1 atm) partial pressure of
xenon was calculated		
*Solubility values w	hich were used in	the final smoothing equation for the
recommended solubilit	ty values given i	in the critical evaluation.
Í		
	AUXILIARY	INFORMATION
METHOD: Used a 125 cm ³	absorption	SOURCE AND PURITY OF MATERIALS:
flash in a water bath	. The amount	1. Xenon-Matheson Co. Maximum
of gas absorbed by the liquid is measured on	e degassed	impurities of 0.02% nitrogen
gas buret. Details an	re given in	and 0.05% Krypton.
ref. 1.		2. Water-redistilled from glass
		apparatus.
APPARATUS / PROCEDURE :		ESTIMATED ERROR:
APPARATUS/PROCEDURE:		ESTIMATED ERROR: Authors estimate error in solubility to be 1%.
APPARATUS / PROCEDURE :		Authors estimate error in solubility
APPARATUS / PROCEDURE :		Authors estimate error in solubility to be 1%.
APPARATUS/PROCEDURE:		Authors estimate error in solubility to be 1%. REFERENCES:
APPARATUS / PROCEDURE :		Authors estimate error in solubility to be 1%.
APPARATUS/PROCEDURE:		Authors estimate error in solubility to be 1%. REFERENCES: 1. Yeh, S-Y.; Peterson, R. E.
APPARATUS/PROCEDURE:		Authors estimate error in solubility to be 1%. REFERENCES: 1. Yeh, S-Y.; Peterson, R. E.

COMPONENTS:	ORIGINAL MEASUREMENTS:
 Xenon-133; ¹³³₅₄xe; 14932-42-4 Water; H₂O; 7732-18-5 	Ladefoged, J.; Andersen, A. M. <u>Phys. Med. Biol.</u> 1967, <u>12</u> , 353-8.
VARIABLES: T/K: 310.15	PREPARED BY: R. Battino
EXPERIMENTAL VALUES:	
	Fraction Ostwald x 10 ⁵ Coefficient L x 10 ²
310.15	5.943* 8.34
The mole fraction solubility at 101 compiler.	,325 Pa (1 atm) was calculated by
AUXILIAR	/ INFORMATION
METHOD: An airtight 2 ml vial was half filled with distilled water. Some 133 Xe was added to the air in the vial. After 24 hrs equilibration the activity in the aqueous and gas phases was measured in a well-type scintillation counter. The result cited above was the average of 107 observations. Solubility was also measured in saline, olive oil, liquid paraffin, solutions of albumin, and blood at 310.15 K.	 Xenon-133. Radiochemical Centre, Amersham. Impurity of other isotopes less than 2%. (Authors) Water.Distilled.
	ESTIMATED ERROR: Result reported by authors as 0.0834 ± 0.0002 for 107 observa- tions.
	REFERENCES :

ORIGINAL MEASUREMENTS: COMPONENTS: Xenon-133; ¹³³₅₄Xe; 14932-42-4 Kitani, K. Scand. J. Clinical and Lab. Invest. 1972, 29, 167-172. 1. 2. Water; H₂O; 7732-18-5 VARIABLES: PREPARED BY: T/K: 310.15 R. Battino EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald Coefficient $x_{1} \times 10^{5}$ $L \times 10^2$ 310.15 5.914* 8.30 The mole fraction solubility at 101.325 kPa (1 atm) was calculated by compiler. *Solubility value which was used in the final smoothing equation for the recommended solubility values which are given in the critical evaluation. AUXILIARY INFORMATION METHOD: Liquid was placed in a septum SOURCE AND PURITY OF MATERIALS: sealed 1 x 1 x 10 cm curette filled 1. Xenon-133. Radiochemical two-thirds. The radioactive gas was Centre, Amersham. in air in the other third. After 2 hrs equilibration the middle por-2. Water.Distilled. tion of the liquid and gas phases were counted using a scintillation counter. Solubilities were also measured in saline, lipids, and blood. ESTIMATED ERROR: Temperature control to $\pm 0.5^{\circ}C$. Results reported by author as 0.0830 + 0.0017 (S.D.) for 17 measurements. **REFERENCES:**

COMDONENTC.	······································		mo
COMPONENTS: 1. Xenon; Xe; 7440-63-	2	ORIGINAL MEASUREMENTS:	
		Ewing, G. J.; Ionescu, L. G.	
2. Water; H ₂ O; 7732-18	-5	J. <u>Chem</u> . <u>Eng</u> . <u>Da</u>	<u>tta</u> 1974, <u>19</u> , 367 -369.
VARIABLES: T/K: 278.15 29 P/kPa: 101.325 - 5 (1 - 5 atm)		PREPARED BY: H. L	. Clever
EXPERIMENTAL VALUES:			
	Henry's Consta	 nt	Mol Fraction
	-	mol Xe kg ⁻¹ H ₂ O)	$x_1 \times 10^5$
278.15 288.15 298.15	109 ± 171 ± 217 ±	8	16.5 10.5 8.3
METUOD	AUXILIARY	INFORMATION	
METHOD:		SOURCE AND PURITY O	
Deionized water was in the reaction vessel, de then equilibrated with desired temperature. Ex- required up to five how in pressure of the xend measured. The moles of by the water was calcu- ideal gas equation from decrease, the gas volum temperature. Measurement	troduced into egassed, and xenon at the quilibration urs. The change on gas was xenon absorbed lated from the n the pressure me and the nts were made	SOURCE AND PURITY O 1. Xenon. J.T.B Stated to co Kr 10 ppm, N H ₂ 5 ppm, hy moisture 5 p	Baker Chemical Co. p_2 50 ppm, O_2 5 ppm, drocarbons 15 ppm, and opm.
Deionized water was in the reaction vessel, do then equilibrated with desired temperature. Ex- required up to five how in pressure of the xend measured. The moles of by the water was calcu- ideal gas equation from decrease, the gas volum	troduced into egassed, and xenon at the quilibration urs. The change on gas was xenon absorbed lated from the m the pressure me and the nts were made p to five atm,	SOURCE AND PURITY O 1. Xenon. J.T.B Stated to co Kr 10 ppm, N H ₂ 5 ppm, hy moisture 5 p 2. Water. Deion ESTIMATED ERROR:	Baker Chemical Co. Intain the impurities 12 50 ppm, O ₂ 5 ppm, drocarbons 15 ppm, and opm. hized.
Deionized water was in the reaction vessel, de then equilibrated with desired temperature. Ea required up to five ho in pressure of the xen measured. The moles of by the water was calcu- ideal gas equation from decrease, the gas volu temperature. Measurement at several pressures up	troduced into egassed, and xenon at the quilibration urs. The change on gas was xenon absorbed lated from the m the pressure me and the nts were made p to five atm,	SOURCE AND PURITY O 1. Xenon. J.T.B Stated to co Kr 10 ppm, N H ₂ 5 ppm, hy moisture 5 p 2. Water. Deion ESTIMATED ERROR:	Baker Chemical Co. p_2 50 ppm, O_2 5 ppm, drocarbons 15 ppm, and ppm.
Deionized water was in the reaction vessel, de then equilibrated with desired temperature. Ea required up to five ho in pressure of the xen measured. The moles of by the water was calcu- ideal gas equation from decrease, the gas volu temperature. Measurement at several pressures up	troduced into egassed, and xenon at the quilibration urs. The change on gas was xenon absorbed lated from the m the pressure me and the nts were made p to five atm,	SOURCE AND PURITY O 1. Xenon. J.T.B Stated to co Kr 10 ppm, N H ₂ 5 ppm, hy moisture 5 p 2. Water. Deion ESTIMATED ERROR: 6T 6P/m REFERENCES: 1. Ewing, G. J.;	Baker Chemical Co. Sontain the impurities 12 50 ppm, O ₂ 5 ppm, drocarbons 15 ppm, and opm. dized. C/K = 0.1 mHg = 0.5

COMPONENTS:	
	ORIGINAL MEASUREMENTS:
<pre>1. Xenon; Xe; 7440-63-3</pre>	Benson, B. B.; Krause, D.
	<u>J. Chem. Phys</u> . 1976, <u>64</u> , 689 - 709.
2. Water; H ₂ O; 7732-18-5	
VARIABLES:	
VARIABLES:	PREPARED BY:
T/K: 274.150 - 318.405	R. Battino
_,	
EXPERIMENTAL VALUES:	
T/K Mol Frac	ction Bunsen
	5 Coefficient
X ₁ x 3	$\alpha \times 10^3$
274.150 17.4	58 214.578
278.157 14.83	
283.154 12.3	
288.150 10.49	
288.150 10.53 293.129 9.04	
293.129 9.04 298.145 7.8	
298.148 7.88	
298.149 7.92	
303.154 6.90	
308.155 6.23 313.150 5.63	
313.150 5.62 318.405 5.13	
	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples	SOURCE AND PURITY OF MATERIALS: 1. Xenon, No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated.	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre-	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No drawings of the apparatus are given	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error in the measurements was 0.02%.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No drawings of the apparatus are given	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error in the measurements was 0.02%.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error in the measurements was 0.02%.
METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error in the measurements was 0.02%.
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METHOD/APPARATUS/PROCEDURE: Gas-free water and the pure gas are equilibrated, and volumetric samples of the liquid and gaseous phases are isolated. The gas dissolved in the water is extracted and the number of moles determined on a special mercury manometer. After removal of the water vapor, the number of moles in the sample of the gaseous phase is measured with the same manometer; from which the pressure (and fugacity) above the solution may be calculated. Real gas corrections are made. Pre- dicted maximum error is 0.02%. No drawings of the apparatus are given	SOURCE AND PURITY OF MATERIALS: 1. Xenon. No comment by authors. 2. Water. No comment by authors. ESTIMATED ERROR: Smoothed data were fit to 0.20% rms by the authors. Calculated error in the measurements was 0.02%.

COMPONENTS :		ORIGINAL	MEASUREMEN	NTS:
 Xenon; Xe; 74 Water; H₂O; 7 	Stephan, E. L., Hatfield, N. S., Peoples, R. S. and Pray, H. A. H., Battelle Memorial Institute Report BMI-1067, <u>1956</u> .			
VARIABLES:	PREPARED BY:			
Temperature, pressu	C. L. Young			
EXPERIMENTAL VALUES:		l		444
Mol T/K P [†] /bar	le fraction of xenon in liquid, ^x Xe	т/к	P [†] /bar	Mole fraction of xenon in liquid, ^x Xe
373.15 9.31 10.0 16.9 17.9 18.6 20.0 435.93 13.4 14.1 15.4	0.000286 0.000281 0.000514 0.000547 0.000555 0.000631 0.000498 0.000490 0.000571	533.15 574.82	12.3 14.5 15.0 15.4	0.000956 0.000932 0.00117 0.00124 0.00120 0.000900 0.000932 0.000932 0.00103
16.5 	0.000635 			0.00108
	AUXILIARY	INFORMATIC		
METHOD/APPARATUS/PRO	CEDURE:	SOURCE AN	D PURITY	OF MATERIALS:
Static equilibrium and liquid equilibr Pressure measured w and temperature mea	apparatus. Gas rated for 18 hours. with Bourdon gauge usured with thermo- on of liquid tric method. Partial pressure acting vapor pres-		No detai	ls given.
			±0.6; δ ±0.00002	<pre>P/bar = ±0.3; (estimated by compiler).</pre>

COMPONENTS :		ORIGINA	L MEASUREMENTS:		
<pre>1. Xenon; Xe;</pre>	[7440-63-3]	1		ntz, H.; Wels . <i>F</i> ., <u>1974</u> , <i>9</i>	
2. Water; H ₂ O;	[7732-18-5]				
VARIABLES:	<u></u>	PREPARE	D BY:		
Temperature, pres	sure	С. L.	Young		
EXPERIMENTAL VALUES:				- <u></u>	<u> </u>
	le fraction of xenon at phase boundary, ^x Xe	T/K		le fraction of at phase boun ^x Xe	
	0.030 0.030 0.030 0.030 0.030 0.030 0.030 0.064 0.064 0.064 0.064 0.064 0.064 0.064 0.064 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.096 0.097 0.187 0.187 0.187	603 583 607 623 625 615 606 609 612 503 583 593 609 620 616 623 527 538 557 571 583 599	2000 200 240 300 350 430 600 850 2000 2370 2700 155 250 280 340 420 520 770 1300 150 175 220 300 370 650	0.187 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.192 0.300 0.300 0.300 0.300 0.300 0.300 0.300 0.300 0.300 0.300 0.300 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0.495 0	(cont.)
	AUXILIARY	INFORMAT	rion	· · · · · · · · · · · · · · · · · · ·	
with thermocouple measured with stra boundary condition discontinuity in a	ic cell with sap- emperature measured and pressure ain gauge. Phase ns obtained from isochoric tempera- ves for mixtures of	1. D P 2. T ESTIMAT δT/K	urity 99.998 riple distil ED ERROR: = ±2; δ ^P /ba 2 (estimated	r Liquide san mole per cen	nt.

COM	PONENTS:		ORIGINAL MEASUREMENTS:
11.	Xenon;	Xe; [7440-63-3]	Franck, E. U.; Lentz, H.; Welsch,
			H.; Z. Phys. Chem., N.F., <u>1974</u> ,93,
2.	Water;	H ₂ O; [7732-18-5]	95.

EXPERIMENTAL VALUES:

т/к	<i>P/</i> bar	Mole fraction of xenon at phase boundary, ["] Xe	т/к	M P/bar	ole fraction of xenon at phase boundary, ^x Xe
621	1300	0.495	582	450	0.630
528	170	0.625	595	680	0.630
547	240	0.625	496	200	0.771
563	310	0.625	533	260	0.771
579	470	0.625	555	370	0.771
603	1200	0.625	573	520	0.771
613	2600	0.625	588	870	0.771
544	220	0.630	597	1600	0.771
551	260	0.630	598	1820	0.771
563	325	0.630	601	2460	0.771

COMPONENTS :	ORIGINAL MEASUREMENTS:
l. Xenon; Xe; 7440-63-3	Stephan, E. L., Hatfield, N. S.,
2. Deuterium oxide; D ₂ O; 7789-20-0	Peoples, R. S. and Pray, H. A. H.,
	Battelle Memorial Institute Report
	BMI-1067, <u>1956</u> .
VARIABLES:	PREPARED BY:
Temperature, pressure	C. L. Young
EXPERIMENTAL VALUES:	
Mole fraction of xenon T/K P [†] /bar in liquid, ^x Xe	Mole fraction of xenon T/K P [†] /bar in liquid, ^x Xe
435.93 10.3 0.000362	533.15 8.9 0.000830
11.0 0.000436 12.7 0.000491	11.0 0.000972 11.7 0.001008
13.4 0.000509	12.3 0.001017
14.1 0.000495 533.15 5.8 0.000571	574.82 6.5 0.000874 7.2 0.000946
6.3 0.000589 6.8 0.000598	7.5 0.001088 8.2 0.001133
8.2 0.000776	8.9 0.001186
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermocouple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres- sure of deuterium oxide from total pressure.	No details given.
	ESTIMATED ERROR: $\delta T/K = \pm 0.6; \delta P/bar = \pm 0.3;$
	$\delta x_{Xe} = \pm 2 - 3$ % (estimated by compiler).
	REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	König, H.
2. Sea Water	
	Z. Naturforschg. 1963, <u>18a</u> , 363-36
	<u><u>2</u>. <u>Maturoroony</u>, 1900, <u>200</u>, 000 00</u>
ARIABLES:	PREPARED BY:
T/K: 273.15 - 298.15	H. L. Clever
P/kPa: 101.325 (1 atm)	A. L. Cramer
XPERIMENTAL VALUES:	
	Xenon Bunsen
cm ³ (STP) kg	-1 Cm ³ (STP) kg ⁻¹ Coefficient
water	sea water sea water
273.15 -	136 0.140
278.15 147	115 0.118
283.15 128	
	90.0 0.0922 80.0 0.0818
293.15 - 298.15 96.4	70.2 0.0717
The sea water chlorinity was 19.3	128. (Salinity S8. = 34.54)
	culated by the compiler using sea water
	LIARY INFORMATION
	LIARY INFORMATION
ETHOD APPARATUS / PROCEDURE:	SOURCE AND PURITY OF MATERIALS;
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS; n of 1. Xenon. Linde. Greater than
ETHOD APPARATUS / PROCEDURE:	SOURCE AND PURITY OF MATERIALS; n of . Xenon. Linde. Greater than . 99.9 percent pure.
ETHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS; n of 99.9 percent pure. ES FIMATED ERROR:
ETHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS; n of . Xenon. Linde. Greater than . 99.9 percent pure.
ÆTHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESFIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 \text{ K}$
ÆTHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESTIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 K$ $= 0.5 \stackrel{>}{-} 298.15 K$
METHOD'APPARATUS/PROCEDURE: The apparatus is a modification	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESFIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 \text{ K}$ $= 0.5 \stackrel{\geq}{-} 298.15 \text{ K}$ REFERENCES:
ÆTHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESTIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 K$ $= 0.5 \stackrel{>}{-} 298.15 K$ REFERENCES: 1. Morrison, T. J.; Billett, F.
ÆTHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESFIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 K$ $= 0.5 \stackrel{>}{-} 298.15 K$ REFERENCES: 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;
ETHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESTIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 K$ $= 0.5 \stackrel{>}{-} 298.15 K$ REFERENCES: 1. Morrison, T. J.; Billett, F.
ETHOD'APPARATUS/PROCEDURE: The apparatus is a modification that of Morrison and Billett (1)	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde. Greater than 99.9 percent pure. ESFIMATED ERROR: $\delta T/K = 1.0 \stackrel{<}{-} 283.15 K$ $= 0.5 \stackrel{>}{-} 298.15 K$ REFERENCES: 1. Morrison, T. J.; Billett, F. J. Chem. Soc. 1948, 2033;

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Xenon: Xe: 7440-63-3 Wood, D.; Caputi, R. 2. Sea Water U.S.N.R.D.L.-TR-988, 27 Feb. 1966 Chem. Abstr. 1967, 66, 118693u. VARIABLES: PREPARED BY: T/K: 274.45 - 321.25 A. L. Cramer P/kPa: 101.325 (1 atm) EXPERIMENTAL VALUES: T/K Henry's Constant Percent Number of Mol Fraction Bunsen Error* Determinations Coefficient $x_{1} \times 10^{2}$ $K = (P_1/mmHg)/X_1$ α Water; H₂O; 7732-18-5 0.425×10^{7} 3 274.45 0.5 0.224 0.0179 0.987×10^{7} 0.00770 299.35 2.0 4 0.0955 1.586×10^7 320.35 0.6 4 0.00479 0.0591 Artificial Sea Water (1), S%. = 34.727 0.568×10^{7} 274.45 2.1 3 0.167 0.0134 1.267×10^{7} 300.15 0.0 2 0.00600 0.0744 1.848×10^7 321.25 2.5 Δ 0.00411 0.0506 *Percent error is the maximum spread in Henry's constant times 100 divided by average Henry's constant. The mole fractions were calculated by the compiler from the average Henry's constant. The Bunsen coefficients were calculated by the compiler from the mole fractions using a solvent mean molecular weight of 18.4823 and sea water densities from the International Critical Tables. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Degassed water was introduced into 1. Xenon. AIRCO, Certified 0.0042 an evacuated apparatus (< 50 μ Hg) impurity, Kr and N₂. Determined and gas bled into burette. After the 0.0001 after experiment. system was isolated, gas was admitted to equilibrium column and the water Water. Distilled three times be-2. was circulated through the column, fore degassing. Sea Water. Artificial, modified flowing over packing of 4 mm Berl from (1). saddles at 110 ml/min for 4-5 hr. Dissolved gas was reclaimed and measured by evacuating the system + < 1 µ Hg and allowing water to dis-ESTIMATED ERROR: $\delta T/K = 0.1, 0.005, 0.03$ till and condense in a cold trap. Water was melted and refrozen until (as T increases) $\delta P/P = 0.001$ all the gas was recovered. Gas was then transferred to a gas burette $\delta H/H = 0.005$ and the pressure was measured with (author's error analysis) a Hg manometer. Purity was checked **REFERENCES**: by gas chromatography. Lyman, J.; Fleming, R. H. 1. J. Mar. Res. 1940, 3, 134.

COMPONENTS:

Xenon; Xe; 7440-63-3
 Water; H₂O; 7732-18-5
 Electrolyte

EVALUATOR: H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. August 1978

CRITICAL EVALUATION:

The solubility of xenon in aqueous electrolyte solutions.

There are data on the solubility of xenon in aqueous NaCl, KI, and Na₃PO₄ solutions. The Setschenow salt effect parameters $k_s = (1/m)\log(S^O/S)$ and $k_{sx} = (1/m)\log(X^O/X)$, where S is volume of gas at STP dissolved kg⁻¹ water and X is the gas mole fraction, are summarized in Table 1.

TABLE 1. Setschenow salt effect parameters for xenon dissolved in aqueous electrolyte solution.

Electrolyte	т/к	mol salt $kg^{-1} H_2^{0}$	k s	k _{sx}	Ref.
NaCl	273.15	0.76	0.182	0.197	2
		1.17	0.185	0.200	
		2.68	0.175	0.190	2 2 2
	293.15	0.285	0.161	0.176	
		1.32	0.161	0.176	2
		1.80	0.154	0.169	2 2 3
	298.15	0.155	0.237	0.252	
		1.0	0.149	0.164	1
	303.15	0.155	0.172	0.187	3 3 3
	310.15	0.155	0.143	0.158	3
	318.15	0.155	0.185	0.200	3
Na3PO4*	298.15	0.066	0.499		3
5 4	303.15	0.066	0.462		3 3 3 3
	310.15	0.066	0.368		3
	318.15	0.066	0.453		3
KI	298.15	1.0	0.113	0.128	1

*Buffer solution, 0.066 mol $Na_3PO_4 dm^{-3}$ solution. The Setschenow parameter is $k_{T_1} = (1/m)\log(L^O/L)$.

The Setschenow parameters from the data of Eucken and Hertzberg (2) and of Morrisson and Johnstone (1) appear to form a self-consistent set of values for aqueous NaCl solutions and they are recommended. The Setschenow salt effect parameters for aqueous NaCl solutions calculated from the data of Yeh and Peterson (3) appear high and erratic. This is partly due to the experimental difficulties in making accurate gas solubility measurements in water and dilute aqueous salt solutions and it may indicate the salt effect parameter is of greater magnitude in the dilute NaCl solution (0.155 molal) than in solutions of 1.0 molal and greater concentration. The Setschenow parameters for xenon in aqueous Na₃PO₄ solution and aqueous KI solution are tentative.

REFERENCES

- 1. Morrison, T.J.; Johnstone, N.B.B. J. Chem. Soc. 1955, 3655.
- 2. Eucken, A.; Hertzberg, G. Z. phys. Chem. 1950, 195, 1.
- 3. Yeh, S.-Y.; Peterson, R.E. J. Pharm. Sci. 1964, 53, 822.

Ladefoged and Anderson (4) report the solubility of xenon-133 in water and standard saline solution. The k_g value calculated from their data is 0.188 at 310.15 K. Isbister, Schofield and Torrance (5) report the solubility of xenon-133 in saline solution. The saline solution was not defined. The solubility value appears to be high and is not recommended.

- 4. Ladefoged, J.; Anderson, A. M. Phys. Med. Biol. 1967, <u>12</u>, 353.
- 5. Isbister, W. H.; Schofield, P. F.; Torrance, H. B. <u>Phys. Med. Biol</u>. 1965, <u>10</u>, 243.

COMPONENTS :	ORIGINAL MEASUREMENTS:			
1. Xenon; Xe; 7440-63-3	Stephan, E. L., Hatfield, N. S.,			
2. Dioxosulfatouranium (Uranyl	Peoples, A. S. and Pray, H. A. H.,			
Sulfate); UO ₆ S; 1314-64-3	Battelle Memorial Institute Report			
3. Water; H ₂ O; 7732-18-5	BMI-1067, <u>1956</u> .			
VARIABLES:	PREPARED BY:			
Temperature, pressure, composition	C. L. Young			
EXPERIMENTAL VALUES:	I			
g Uranium T/K per liter P [†] /bar Solubility*	g Uranium T/K per liter ^{p†} /bar Solubility			
373.15 40 12.1 0.432	435.93 40 18.9 0.756			
12.4 0.443 12.8 0.465	19.6 0.79 533,15 40 17.5 1.51			
435.93 40 11.7 0.47	18.2 1.53			
12.0 0.505	18.5 1.63			
12.3 0.52 18.2 0.735	18.9 1.66			
	INFORMATION			
METHOD/APPARATUS/PROCEDURE:	INFORMATION SOURCE AND PURITY OF MATERIALS:			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS:			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS: No details given.			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS: No details given. ESTIMATED ERROR: δT/K = ±0.6; δP/bar = ±0.3; δ(solubility) = ±3% (estimated by			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS: No details given. ESTIMATED ERROR: δT/K = ±0.6; δP/bar = ±0.3; δ(solubility) = ±3% (estimated by compiler).			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS: No details given. ESTIMATED ERROR: δT/K = ±0.6; δP/bar = ±0.3; δ(solubility) = ±3% (estimated by			
METHOD/APPARATUS/PROCEDURE: Static equilibrium apparatus. Gas and liquid equilibrated for 18 hours. Pressure measured with Bourdon gauge and temperature measured with thermo- couple. Composition of liquid estimated by volumetric method. Details in source. Partial pressure estimated by subtracting vapor pres-	SOURCE AND PURITY OF MATERIALS: No details given. ESTIMATED ERROR: δT/K = ±0.6; δP/bar = ±0.3; δ(solubility) = ±3% (estimated by compiler).			

COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Xenon; Xe; 7440-63-3	Morrison, T.J.; Johnstone, N.B.B.		
2. Water; H ₂ O; 7732-18-5			
3. Alkali Halides			
	<u>J. Chem</u> . <u>Soc</u> . 1955, 3655-3659.		
VARIABLES: T/K: 298.15	PREPARED BY: T.D. Kittredge		
P/kPa: 101.325 (1 atm)	H.L. Clever		
EXPERIMENTAL VALUES:			
T/K k = (1/m) log (S ^O)	$(S) k_{SX} = (1/m) \log (X^{O}/X)$		
Sodium Chloride; NaCl; 764	7-14-5		
298.15 0.149	0.164		
Potassium Iodide; KI; 7681	-11-0		
298.15 0.113	0.128		
The values of the Setschenow salt effect parameter, k_s , were apparently determined from only two solubility measurements. They were the solubilit of xenon in pure water, S ^O , and the solubility of xenon in a near one equivalent of salt per kg of water solution, S. No solubility values are given in the paper. The S ^O /S ratio was referenced to a solution containing one kg of water. The compiler calculated the salt effect parameter k_{sX} from the mole fraction solubility ratio X ^O /X. The electrolytes were assumed to be 100 per cent dissociated and both cation and anion were used in the mole fraction.			
AUXILIARY	INFORMATION		
ME THOD:	SOURCE AND DUDITY OF MATERIALS.		
Gas absorption in a flow system.	1. Xenon. British Oxygen Co. Ltd.		
	2. Water. No information given.		
	3. Electrolyte. No information given.		
	ESTIMATED ERROR:		
APPARATUS/PROCEDURE:			
The previously degassed solvent flows in a thin film down an absorp-	$\delta k_{\rm s} = 0.010$		
tion spiral containing the gas plus solvent vapor at a total pressure of			
one atm. The volume of gas absorbed	REFERENCES :		
is measured in attached calibrated burets (1).	l. Morrison, T.J.; Billett, F.		
	J. Chem. Soc. 1952, 3819.		

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Eucken, A.; Hertzberg, G.
2. Water; H ₂ O; 7732-18-5	
3. Sodium Chloride; NaCl; 7647-14-5	<u>Z. physik</u> . <u>Chem</u> . 1950, <u>195</u> , 1-23.
VARIABLES:	PREPARED BY:
T/K: 273.15 - 293.15 P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
	stwald Setschenow Constant
mol kg ⁻¹ H ₂ O Coe:	Efficient $k = (1/m) \log (L^O/L)$
	0.222
	0.1595 0.188 0.1323 0.190
	0.0719 0.184
293.15 0	0.1188
0.285	0.1062 0.164
	0.0710 0.168 0.0605 0.163
J	
AUXILIARY	INFORMATION
METHOL /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Gas absorption. The apparatus	Components. No information given.
consists of a gas buret and an ad- sorption flask connected by a	
capillary tube. The whole apparatus	
is shaken. The capillary tube is a 2m-long glass helix. An amount of	
gas is measured at STP and placed in	
the gas buret. After shaking, the	
difference from the original amount of gas placed in the gas buret is	
determined.	
	ESTIMATED ERROR:
	LOTHERIED ERROR.
	$\delta L/L \approx 0.01$
]	REFERENCES:

COMPONENTS: 1. Xenon; Xe; 7440-63-3	
1. Xenon: Xe: 7440-63-3	ORIGINAL MEASUREMENTS:
	Yeh, S.Y.; Peterson, R.E.
2. Water; H ₂ O; 7732-18-5	
3. Sodium Chloride; NaCl; 7647-14-5	<u>J. Pharm</u> . <u>Sci</u> ., 1964, <u>53</u> , 822-824.
VARIABLES: T/K: 298.15 - 318.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
T/K Ostwald ΔH ^O /c Coefficient L	$al mol^{-1} \Delta S^{\circ}/cal K^{-1} mol^{-1}$
303.15 0.0895 -4	801 -27.0 533 -26.1 158 -24.9
318.15 0.0680 -3	-26.6
For comparison, the authors'Ostwald coefficients in water were 0.1068, 0.0958, 0.0827 and 0.0737 at the four temperatures. The sodium chloride solution was 0.9 weight percent which is about 0.155 molal. Each solubility value is the average of three to four measurements, the standard deviation of each measurement closely approximated 1.0 per cent.	
AUXILTARY	INFORMATION
	-
AUXILIARY METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined.	<pre>INFORMATION SOURCE AND PURITY OF MATERIALS; 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade.</pre>
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T - C$ $\Delta H^{O} = R(-2.3A + BT - T)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade. ESTIMATED ERROR:</pre>
<pre>METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): log S = A/T + B log T - C</pre>	 SOURCE AND PURITY OF MATERIALS; 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium chloride. Analytical grade.

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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Yeh, S.Y.; Peterson, R.E.
2. Water; H ₂ O; 7732-18-5	
3. Sodium Phosphate (phosphate	
buffer); Na ₃ PO ₄ ; 7601-54-9	<u>J. Pharm. Sci</u> ., 1964, <u>53</u> , 822-4.
ARIABLES: T/K: 298.15 - 318.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever
XPERIMENTAL VALUES:	
T/K Ostwald ΔH ^O /ca Coefficient L	al mol ⁻¹ $\Delta S^{O}/cal K^{-1} mol^{-1}$
303.15 0.0893 -43 310.15 0.0782 -39	$\begin{array}{cccc} & -26.3 \\ 320 & -25.4 \\ 977 & -24.3 \\ 585 & -23.1 \end{array}$
For comparison, the authors' Ostwald co 0.0958, 0.827 and 0.0737 at the four	
The sodium phosphate solution was 0.06	-
Each solubility value is the average of	
AUXILIARY	INFORMATION
ETHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
ETHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three	SOURCE AND PURITY OF MATERIALS:
ETHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass
ETHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined.	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical
<pre>ÆTHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): log S = A/T + B log T-C</pre>	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical grade.
ÆTHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T-C$ $\Delta H^{O} = R(-2.3A + BT - T)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical grade. ESTIMATED ERROR:</pre>
ÆTHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T-C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + C)$	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical grade.
METHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T-C$ $\Delta H^{O} = R(-2.3A + BT - T)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical grade. ESTIMATED ERROR:</pre>
ÆTHOD /APPARATUS/PROCEDURE: Freshly boiled solution was intro- duced into 125 ml. absorption flask of solubility apparatus (1), then frozen and boiled under vacuum three times. Water-saturated gas was in- troduced and equilibrated (2) and weight of solution was determined. Thermodynamic constants were calcu- lated from equations (3): $\log S = A/T + B \log T-C$ $\Delta H^{O} = R(-2.3A + BT - T)$ $\Delta S^{O} = R(-B-BlnT + 2.3C + MC)$	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co. 2. Water. Distilled from glass apparatus. 3. Sodium phosphate. Analytical grade. ESTIMATED ERROR:</pre>

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COMPONENTS: ORIGINAL MEASUREMENTS: 1. Xenon; Xe; 7440-63-3 Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. 2. Pentane; C₅H₁₂; 109-66-0 Hung. J. Ind. Chem. 1976, 4, 269-280. VARIABLES: PREPARED BY: T/K: 298.15 P/kPa: 101.325 (1 atm) S.A. Johnson **EXPERIMENTAL VALUES:** T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_1 \times 10^2$ α L 2.731 298.15 5.420 5.916 The mole fraction and Bunsen coefficient were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Volumetric method. The apparatus Both the gas and liquid were analytiof Bodor, Bor, Mohai, and Sipos (1) cal grade reagents of Hungarian or was used. foreign origin. No further information. ESTIMATED ERROR: $\delta X_1 / X_1 = 0.03$ **REFERENCES**: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. <u>Veszpremi Vegyip. Egy. Kozl</u>. 1957, <u>1</u>, 55. Chem. Abstr. 1961, 55, 3175h.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Clever, H.L.
2. Hexane; C ₆ H ₁₄ ; 110-54-3	
	J. Phys. Chem. 1958, 62, 375-376.
]	
VARIABLES:	PREPARED BY:
T/K: 289.15 - 316.25 P/kPa: 101.325 (1 atm)	C.E.Edelman
P/KPA: 101.525 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES:	<u>t</u>
T/K Mol Fraction	Bunsen Ostwald
$x_1 \times 10^2$	Coefficient Coefficient
	α L
289.15 2.98 298.45 2.54	5.29 5.60 4.43 4.84
307.55 2.29	3.95 4.45
316.25 2.01	3.41 3.95
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln I$	$X_1 = -10808 + 66.635 T$
	*
Std. Dev. $\Delta G = 27.6$, C	coef. Corr. = 0.9994 , $\Delta S^{O}/J K^{-1} mol^{-1} = -66.635$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
X ₁ ×	10 ²
288.15 3.0	01 8,393.1
293.15 2.7	
303.15 2.4 308.15 2.2	41 9,392.6 25 9,725.8
313.15 2.1	10,055
318.15 1.9	10,392
Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. Hung. J. Ind. Chem. 1976, 4, 269 report an Ostwald coefficient of 5.065 (mole fraction 2.652 $\times 10^{-2}$) at 298.15K. The value was not used in the smoothed data fit above.	
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS;
The solvent is saturated with gas	1. Xenon. Linde Air Products Co.
as it flows through an 8 mm x 180 cm glass helix attached to a gas buret.	2. Hexane. Humphrey-Wilkinson, Inc.
The total pressure of solute gas plus	Shaken with conc. H_2SO_4 , water
solvent vapor is maintained at 1 atm	washed, dried over Na, distilled,
as the gas is absorbed.	b.p. 68.23 - 68.52 ^o C.
The solubility values were adjusted to a partial pressure of xenon of	
101.325 kPa (1 atm) by Henry's law.	
The Bunsen coefficients were calcu- lated by the compiler.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR: $\delta T/K = 0.05$
The apparatus is a modification of	$\delta P/mmHg = 3$ $\delta Y / X = 0.01$
that of Morrison and Billett (1). The modifications include the addi-	$\delta x_1 / x_1 = 0.01$
tion of a spiral storage for the	REFERENCES :
solvent, a manometer for a constant reference pressure, and an extra	1. Morrison, T.J.; Billett, F.
buret for highly soluble gases. The	J. Chem. Soc. 1948, 2033;
solvent is degassed by a modifica- tion of the method of Baldwin and	<u>ibid</u> . 1952, 3819.
Daniel (2).	2. Baldwin, R.R.; Daniel, S.G.
	<u>J. Appl. Chem</u> . 1952, <u>2</u> , 161.
1	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Makranczy, J.; Megyery-Balog, K.;
2. Heptane; C ₇ H ₁₆ ; 142-82-5	Rusz, L.; Patyi, L.
7 ¹¹⁶ , 142-02-5	
	<u>Hung</u> . J. Ind. Chem. 1976, <u>4</u> , 269-280.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	S.A. Johnson
	H.L. Clever
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$\underline{\qquad \qquad } \underbrace{x_1 \times 10^2}_{10}$	α <u>L</u>
<u>298.15</u> 2.602	4.060 4.432
The mole fraction and Bunsen coefficie	ent were calculated by the compiler.
Steinberg, M.; Manowitz, B. Ind. Eng. tion coefficient of 3.27 (mole fraction	$\frac{Cnem}{1.97}$, $\frac{51}{2}$, $\frac{4}{1}$ report an absorp-
system. A comparison of the solubility	ty of xenon in several closely related
hydrocarbons with the values of the set the Steinberg and Manowitz value is particular to the set of the set o	olubility of xenon in heptane indicates
value is consistent with other values	and is accepted as the tentative
solubility value.	
ΔΙΙΥΤΙΤΑΡΥ	INFORMATION
	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa-
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analyti- cal grade reagents of Hungarian or foreign origin. No further informa- tion.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.;
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1/X_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl. 1957, <u>1</u> , 55.
METHOD/APPARATUS/PROCEDURE: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1)	SOURCE AND PURITY OF MATERIALS: Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta x_1/x_1 = 0.03$ REFERENCES: 1. Bodor, E.; Bor, Gy.; Mohai, B.; Sipos, G. Veszpremi Vegyip. Egy. Kozl.

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Clever, H.L.
T. VEHON' VE! 1440-02-2	ATEACT 1 HOTO
<pre>2. 2,2,4-Trimethylpentane (Isooctane); C₈H₁₈; 540-84-1</pre>	<u>J</u> . <u>Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 375-376.
VARIABLES:	PREPARED BY:
T/K: 289.15 - 316.15 P/kPa: 101.325 (1 atm)	C.E. Edelman A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
289.15 3.13 298.65 2.64 307.55 2.41	4.42 4.68 3.73 4.08 3.29 3.70
316.15 2.14	2.90 3.36
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -10,419 + 64.929 T$
Std. Dev. $\Delta G = 36.7$, Coef. Corr. = 0.9988 $\Delta H^{O}/J \text{ mol}^{-1} = -10,419$, $\Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -64.929$ T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ $X_1 \times 10^2$	
288.15 3.1	4 8,289.9
	92 8,614.6
298.15 2.7	72 8,939.2
303.15 2.5	
308.15 2.3	•
313.15 2.2 318.15 2.0	22 9,913.2 08 10,238
AUXILIARY INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:
The solvent is saturated with gas	1. Xenon. Linde Air Products Co.
as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed.	2. 2,2,4-Trimethylpentane. Enjay Co. Used as received.
The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law.	
The Bunsen coefficients were calcu- lated by the compiler.	ECTIMATED EDDOD-
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addition of a spiral storage for the solvent, a	$\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES:
manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification of the method of Baldwin and Daniel (2).	1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; ibid. 1952, 3819.
meenou or bardwin and banter (2).	 Baldwin, R.R.; Daniel, S.G. J. <u>Appl. Chem</u>. 1952, <u>2</u>, 161.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Makranczy, J.; Megyery-Balog, K.;
	Rusz, L.; Patyi, L.
2. C_8 to C_{11} Alkanes	
	<u>Hung. J. Ind. Chem. 1976, 4, 269-280.</u>
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	S.A. Johnson
EXPERIMENTAL VALUES: T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
Octane; C ₈ H ₁₈ ; 111-65-	9
298.15 2.538	3.570 3.897
Nonane; C ₉ H ₂₀ ; 111-84-	
	3.200 3.493
Decane; C ₁₀ H ₂₂ ; 124-18	
298.15 2.472	2.900 3.165
Undecane; C ₁₁ H ₂₄ ; 1120	
298.15 2.465	2.670 2.914
AUXILIA	RY INFORMATION
METHOD /APPARATUS/PROCEDURE:	
	SOURCE AND PURITY OF MATERIALS:
Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1) was used.	
of Bodor, Bor, Mohai, and Sipos (1)	s Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin.
of Bodor, Bor, Mohai, and Sipos (1)	Both the gas and liquid were analytical grade reagents of Hungarian or foreign origin. No further information.

COMPONENTS :	OPTOTNAL MEACUDEACONCE
1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Clever, H.L.
2. Dodecane; C ₁₂ H ₂₆ ; 112-40-3	
	J. Phys. Chem. 1958, 62, 375-376.
VARIABLES: T/K: 289.15 - 316.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	C.E. Edelman A.L. Cramer
EXPERIMENTAL VALUES:	
	Bunsen Ostwald Coefficient Coefficient
$x_1 \times 10^2$	
	3.57 3.78
	3.07 3.35
307.55 2.74	2.74 3.08 2.45 2.84
316.15 2.47	
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln$	
Std. Dev. $\Delta G = 17.2, C$	
$\Delta H^{O}/J \text{ mol}^{-1} = -9,514.1$	$\Delta s^{\circ}/J K^{-1} mol^{-1} = -60.872$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
x, x	10 ²
288.15 3.5 293.15 3.2	51 8,026.1 8 8,330.5
J 298.15 3.0	07 8,634.8
303.15 2.8 308.15 2.7 313.15 2.5	38 8,939.2 71 9,243.5
313,15 2,5	5 9.547.9
318.15 2.4	1 9,852.3 Isz, L.; Patyi, L. Hung. J. Ind. Chem.
1976. 4. 269 report an Ostwald coeff	icient of 2.685 (mole fraction 2.448
x 10^{-2} at 298.15K. The value was no	ot used in the smoothed data fot above.
The solubility values were adjusted to	a partial pressure of xenon of
101.325 kPa (1 atm) by Henry's law.	
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
The solvent is saturated with gas	1. Xenon. Linde Air Products Co.
as it flows through an 8 mm x 180 cm glass helix attached to a gas buret.	2. Dodecane. Humphrey-Wilkinson,
The total pressure of solute gas plus	Inc. Shaken with conc. H_2SO_4 ,
solvent vapor is maintained at 1 atm	water washed, dried over Na.
as the gas is absorbed.	
The Bunsen coefficients were calcu- lated by the compiler.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR: $\delta T/K = 0.05$
The apparatus is a modification of	$\delta P/mmHg = 3$
that of Morrison and Billett (1). The modifications include the addi-	$\delta X_1 / X_1 = 0.01$
tion of a spiral storage for the	REFERENCES:
solvent, a manometer for a constant	
reference pressure, and an extra buret for highly soluble gases. The	J. Chem. Soc. 1948, 2033;
solvent is degassed by a modifica-	<u>ibid. 1952,</u> 3819.
tion of the method of Baldwin and Daniel (2).	2. Baldwin, R.R.; Daniel, S.G.
	J. Appl. Chem. 1952, 2, 161.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Xenon; Xe; 7440-63-3 Makranczy, J.; Megyery-Balog, K.; Rusz, L.; Patyi, L. 2. C₁₃ to C₁₆ Alkanes Hung. J. Ind. Chem. 1976, 4, 269-280. VARIABLES: PREPARED BY: 298.15 T/K: P/kPa: 101.325 (1 atm) S.A. Johnson EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Ostwald Coefficient Coefficient $x_{1} \times 10^{2}$ α L Tridecane; C13H28; 629-50-5 298.15 2.421 2.270 2.478 Tetradecane; C₁₄H₃₀; 629-59-4 298.15 2.412 2.120 2.314 Pentadecane; C₁₅H₃₂; 629-62-9 2.382 298.15 1.970 2.150 Hexadecane; C₁₆H₃₄; 544-76-3 2.369 298.15 1.850 2.019 The mole fraction and Bunsen coefficient were calculated by the compiler. AUXILIARY INFORMATION METHOD / APPARATUS / PROCEDURE : SOURCE AND PURITY OF MATERIALS: Volumetric method. The apparatus of Bodor, Bor, Mohai, and Sipos (1) Both the gas and liquid were analytical grade reagents of was used. Hungarian or foreign origin. No further information. ESTIMATED ERROR: $\delta X_1 / X_1 = 0.03$ **REFERENCES**: Bodor, E.; Bor, Gy.; Mohai, B.; 1. Sipos, G. <u>Veszpremi Vegyip. Egy. Kozl.</u> 1957, <u>1</u>, 55. Chem. Abstr. 1961, 55, 3175h.

COMPONENTS: 1. Xenon; Xe; 7440-63-3 2. Cyclohexane; C₆H₁₂; 110-82-7 H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. August 1978

CRITICAL EVALUATION:

Both Clever (1) and Dymond (2) measured the solubility of xenon in cyclohexane at four temperatures in the room temperature range. Dymond's data is more self-consistent than Clever's data. The smoothed data differs by 5.4 per cent at 288.15 K and 2.1 per cent at 308.15 K with Dymond's mole fraction solubilities greater than Clever's.

Dymond's four values and Clever's values at 307.60 and 316.25 K were combined in a linear regression of a Gibbs energy equation linear in temperature to obtain the recommended equation.

The recommended thermodynamic values for the transfer of xenon from the gas at 101.325 kPa (1 atm) to the hypothetical unit mole fraction solution are

 $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln X_{1} = -9,980.4 + 65.625 T$

Std. Dev. $\Delta G^{\circ} = 28.3$, Coef. Corr. = 0.9987

 $\Delta H^{\circ}/J \text{ mol}^{-1} = -9,980.4, \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -65.625$

The recommended values of the mole fraction solubility at 101.325 kPa and the Gibbs energy of solution as a function of temperature are given in Table 1.

TABLE 1. Solubility of xenon in cyclohexane. Recommended mole fraction solubility and Gibbs energy of solution as a function of temperature.

 Т/К	Mol Fraction $x_1 \times 10^2$	ΔG ^O /J mol ⁻¹
288.15	2.41	8,929.6
293.15	2.24	9,257.7
298.15	2.09	9,585.9
303.15	1.96	9,914.0
308.15	1.84	10,242
313.15	1.73	10,570
318.15	1.62	10,898

REFERENCES

1. Clever, H.L. J. Phys. Chem. 1958, 62, 375.

2. Dymond, J.H. J. Phys. Chem. 1967, 71, 1829.

COMPONENTS:		
1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Clever, H.L.	
2. Cyclohexane; C ₆ H ₁₂ ; 110-82-7		
	<u>J. Phys</u> . <u>Chem</u> . 1958, <u>62</u> ,	375-376.
VARIABLES:	PREPARED BY:	<u></u>
T/K: 289.15 - 316.25 P/kPa: 101.325 (1 atm)	C.E. Edelman	
17, Alu: 101, 525 (1 uuli)	A.L. Cramer	
EXPERIMENTAL VALUES:		
T/K Mol Fraction	Bunsen Ostwald	
$x_1 \times 10^2$	oefficient Coefficient α L	
289.15 2.33 299.15 1.92	4.97 5.26 4.04 4.42	
307.60 1.81	3.77 4.25	
316.25 1.68	3.45 4.00	
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	-	
Std. Dev. ∆G = 76.7, C		
See the evaluation of xenon + cyclohe equation and smoothed solubility valu	xane for the recommended G es.	ibbs energy
The solubility yalues were adjusted t 101.325 kPa (l atm) by Henry's law.	o a partial pressure of xe	non of
The Bunsen coefficients were calculat	ed by the compiler.	
AUXILIARY	INFORMATION	
AUXILIARY METHOD: The solvent is saturated with gas	INFORMATION SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro	
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro	ducts Co.
METHOD: The solvent is saturated with gas	SOURCE AND PURITY OF MATERIALS	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed.	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillig	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: δT/K = 0.05	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1).	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR:	oducts Co. os Petroleum
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi-	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$	oducts Co. os Petroleum
<pre>METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed.</pre> APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES:	oducts Co. os Petroleum 1.
<pre>METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed.</pre> APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Bille	oducts Co. os Petroleum 1. ett, F.
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES:	oducts Co. os Petroleum 1. ett, F.
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Bille J. Chem. Soc. 1948, 2	oducts Co. os Petroleum 1. ett, F. 2033;
METHOD: The solvent is saturated with gas as it flows through an 8 mm x 180 cm glass helix attached to a gas buret. The total pressure of solute gas plus solvent vapor is maintained at 1 atm as the gas is absorbed. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modification of the method of Baldwin and Daniel	SOURCE AND PURITY OF MATERIALS 1. Xenon. Linde Air Pro 2. Cyclohexane. Phillip Co. Used as received ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Bille J. Chem. Soc. 1948, 2 <u>ibid</u> . 1952, 3819.	oducts Co. os Petroleum 1. ett, F. 2033; ., S.G.

COMPONENTS :		ORIG	INAL MEASUR	EMENTS:	
1. Xenon; Xe;	7440-63-3	1	ond, J. H		
	; C ₆ H ₁₂ ; 110-82-7	-			
	, -6-12,				
		<u>J</u> .	Phys. Che	<u>m</u> . 1967, <u>71</u> ,	1829 - 1831.
VARIABLES:	<u> </u>	PREF	ARED BY:	<u> </u>	<u></u>
	292.32 - 309.20 101.325 (1 atm)			M. E. Derric	k
EXPERIMENTAL VALUE	S:		<u></u>		
	T/K Mol Frac	tion P	unsen	Ostwald	
	$\frac{x_1 \times 1}{x_1}$	Coe		Coefficient L	
	292.32 2.28		4.84	5.18	
	298.012.10306.151.885		4.42 3.92	4.82 4.39	
-	309.20 1.815		3.76	4.26	~
Smoothed Data:	$\Delta G^{\circ}/J \mod^{-1} = -R^{\circ}$	T ln X ₁ =	-10,147	+ 66.159 т	
	Std. Dev. $\triangle G^\circ = 3$.0 , Coe	ef. Corr.	= 0.9999	
equation and th	ion of xenon + cyc e smoothed solubil Ostwald coefficien	ity value	es.		
equation and th	e smoothed solubil	ity value	es.		
equation and th	e smoothed solubil Ostwald coefficien	ity value	es.		
equation and th	e smoothed solubil Ostwald coefficien	ity value ts were o LIARY INFO	es. calculated		ler.
equation and th The Bunsen and METHOD: Saturation of J	e smoothed solubil Ostwald coefficien AUXI	ity value ts were of LIARY INFO par- 1.	es. calculated	by the compi	ler.
equation and th The Bunsen and METHOD: Saturation of J	e smoothed solubil Ostwald coefficien	ity value ts were of LIARY INFO par- 1.	es. calculated RMATION RCE AND PURI Xenon. Cyclohes and Bell	TY OF MATERIALS Matheson Co ane. Matheso . Chromatoqua	ler. ; ; o., dried. on, Coleman, ality reagent.
equation and th The Bunsen and METHOD: Saturation of J	e smoothed solubil Ostwald coefficien AUXI Liquid with gas at of gas equal to 1 a	ity value ts were c LIARY INFO par- 1. tm. 2.	RMATION RCE AND PURI Xenon. Cyclohex and Bell Dried ar	TY OF MATERIALS Matheson Co ane. Matheso C. Chromatoqua d fractionall 5 ° C.	ler. ; ; o., dried. on, Coleman, ality reagent
equation and th The Bunsen and METHOD: Saturation of J tial pressure of APPARATUS/PROCEDU Dymond-Hildebra an all-glass pu	AUXI AUXI AUXI Liquid with gas at of gas equal to 1 a RE: and apparatus (1) u mping system to sp	ity value ts were c LIARY INFO par- 1. 2. EST sing ray	es. calculated RMATION RCE AND PURI Xenon. Cyclohes and Bell Dried ar m.p. 6.4	TY OF MATERIALS Matheson Co ane. Matheso . Chromatoqua d fractionall 5 ° C.	ler. ; ; o., dried. on, Coleman, ality reagent
equation and th The Bunsen and METHOD: Saturation of 1 tial pressure of Dymond-Hildebra an all-glass pu slugs of degass gas. Amount of	AUXI AUXI Liquid with gas at of gas equal to 1 a RE: and apparatus (1) u	ity value ts were c LIARY INFO par- tm. 2. EST ssing ray ecu-	<pre>ss. salculated RMATION RCE AND PURI Xenon. Cyclohes and Bell Dried ar m.p. 6.4 IMATED ERROI δX₁/X₁ = ERENCES: Dymond,</pre>	TY OF MATERIALS Matheson Co ane. Matheso . Chromatoqua d fractionall 5 ° C.	ler. : b., dried. on, Coleman, ality reagent by frozen. ad, J. H.

000 DOVD0172	
COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Clever, H.L.; Saylor, J.H.;
	Gross, P.M.
2. Methylcyclohexane; C ₇ H ₁₄ ; 108-87-2	
	<u>J. Phys. Chem.</u> 1958, <u>62</u> , 89-91.
VARIABLES:	PREPARED BY:
T/K: 289.15 - 316.25	
Total P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	<u>1,</u>
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$\underbrace{x_1 \times 10^2}$	
289.15 2.50	4.53 4.80
303.15 2.18 316.25 1.85	3.87 4.30 3.22 3.73
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	$x_1 = -8453.0 + 59.833 \text{ T}$
Std. Dev. $\Delta G^{O} = 36.8$,	
$\Delta H^{O}/J \text{ mol}^{-1} = -8453.0$	$, \Delta s^{\circ}/J \kappa^{-1} mol^{-1} \approx -59.833$
T/K Mol Fr.	action $\Delta G/J \text{ mol}^{-1}$
x, x	
288.15 2. 293.15 2.	55 8,788.0 40 9,087.1
298.15 2.1	27 9,386.3
	14 9,685.5 03 9,984.6
313.15 1.	93 10,284
318.15 1.	83 10,583
The solubility values were adjusted to	o a partial pressure of xenon of
101.325 kPa (1 atm) by Henry's law.	
The Bunsen coefficients were calculate	ed by the compiler.
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The apparatus (1) is a modification of that used by	1. Xenon. Matheson Co., Inc. Both standard and research grades were
Morrison and Billett (2). Modifica-	used.
tions include the addition of a spiral solvent storage tubing, a man-	2. Methylcyclohexane. Eastman Kodak
ometer for constant reference pres-	Co., white label. Dried over Na
sure, and an extra gas buret for highly soluble gases.	and distilled; corrected b.p. 100.95 to 100.97°, lit. b.p.
mignin borubit gubes.	100.93°C.
	1
	ESTIMATED ERROR:
APPARATUS/PROCEDURE: (a) Degassing. 700 ml of solvent	$\delta T/K = 0.05$
is shaken and evacuated while attached	$\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.03$
to a cold trap, until no bubbles are seen; solvent is then transferred	
through a 1 mm capillary tubing, re-	
leased as a fine mist into a continu- ously evacuated flask. (b) Solvent	1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
is saturated with gas as it flows	J. Phys. Chem. 1957, 61, 1078.
through 8 mm x 180 cm of tubing at- tached to a gas buret. Pressure is	2. Morrison, T.J.; Billett, F.
maintained at 1 atm as the gas is	J. Chem. Soc. 1948, 2033;
absorbed.	ibid. 1952, 3819.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Clever, H.L.
2. Benzene; C ₆ H ₆ ; 71-43-2	
	<u>J. Phys. Chem.</u> 1958, <u>62</u> , 375-376.
VARIABLES:	PREPARED BY:
т/к: 289.15 - 316.25	C.E. Edelman
P/kPa: 101.325 (1 atm)	A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
2 (Coefficient Coefficient
$x_1 \times 10^2$	a L
289.15 1.32	3.39 3.59
298.15 1.11	2.82 3.08
307.60 1.06	2.65 2.98
316.25 1.01	2.50 2.90
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln In$	$X_{-} = -7.062.5 + 60.704 \text{ T}$
Std. Dev. $\Delta G = 91.5$, G	
$\Delta H^{O}/J \text{ mol}^{-1} = -7,062.9$	5, $\Delta S^{O}/J K^{-1} mol^{-1} \approx -60.704$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ ×	10
288.15 1.	29 10,429
298.15 1.	16 11,037
505.15 1.	11 11,340
308.15 1. 313.15 1.	06 11,644 02 11,947
515.15 1.	974 12,251
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AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS;
The solvent is saturated with gas	1. Xenon. Linde Air Products Co.
as it flows through an 8 mm x 180 cm	
glass helix attached to a gas buret.	2. Benzene. Jones & Laughlin Steel
The total pressure of solute gas plus solvent vapor is maintained at 1 atm	Co. Shaken with conc. H ₂ SO ₄ ,
l solvont vanor is maintained at l atm	
	water washed, dried over Na,
as the gas is absorbed.	
as the gas is absorbed. The solubility values were adjusted	water washed, dried over Na, distilled, b.p. 80.03-80.04 ⁰ C.
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of	
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law.	
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law. The Bunsen coefficients were calcu-	
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law.	distilled, b.p. 80.03-80.04 [°] C.
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law. The Bunsen coefficients were calcu-	
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (l).	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi-	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the	distilled, b.p. $80.03-80.04^{\circ}$ C. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033;
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modifica-	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Billett, F.
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modifica- tion of the method of Baldwin and	distilled, b.p. $80.03-80.04^{\circ}C$. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; <u>ibid</u> . 1952, 3819.
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (1). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modifica-	distilled, b.p. $80.03-80.04^{\circ}$ C. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; <u>ibid</u> . 1952, 3819. 2. Baldwin, R.R.; Daniel, S.G.
as the gas is absorbed. The solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law. The Bunsen coefficients were calcu- lated by the compiler. APPARATUS/PROCEDURE: The apparatus is a modification of that of Morrison and Billett (l). The modifications include the addi- tion of a spiral storage for the solvent, a manometer for a constant reference pressure, and an extra buret for highly soluble gases. The solvent is degassed by a modifica- tion of the method of Baldwin and	distilled, b.p. $80.03-80.04^{\circ}$ C. ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 3$ $\delta X_1/X_1 = 0.01$ REFERENCES: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033; <u>ibid</u> . 1952, 3819.

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	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Saylor, J. H.; Battino, R.
2. Methylbenzene (Toluene); C ₇ H ₈ ; 108-88-3	
	J. Phys. Chem. 1958, <u>62</u> , 1334-1337.
VARIABLES: T/K: 288.15 - 328.15 P/kPa: 101.325 (l atm)	PREPARED BY: H. L. Clever
EXPERIMENTAL VALUES:	L
$\frac{T/K Mol \; Fraction}{X_1 \; \times \; 10^2}$ 288.15 1.637	BunsenOstwaldCoefficientCoefficient α L3.5263.722
328.15 1.078	2.210 2.655
	7, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -62.829$
T/K Mol Frac X _l x l	
288.15 1.64 298.15 1.46	
308.15 1.40	11,102
318.15 1.19 328.15 1.08	
INI, 125 KPA II ATTU DV HEDRV'S LAW	o a partial pressure of xenon of
101.325 kPa (1 atm) by Henry's law. The Bunsen coefficients were calculat	
The Bunsen coefficients were calculat	
The Bunsen coefficients were calculat	ed by the compiler.
The Bunsen coefficients were calculat	ed by the compiler. INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Linde Air Products Co. 2. Toluene. Mallinckrodt. Reagent grade. Shaken over conc. H ₂ SO ₄ , water washed, dried over Drierite, distilled b.p. 110.40 - 110.60°C.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Xenon; Xe; 7440-63-3 Steinberg, M.; Manowitz, B. 2. Aromatic Hydrocarbons Ind. Eng. Chem. 1959, 51, 47-51. VARIABLES: PREPARED BY: T/K: 273.15 - 305.15 H.L. Clever 101.325 (1 atm) P/kPa: A.L. Cramer EXPERIMENTAL VALUES: T/K Mol Fraction Bunsen Absorption Coefficient Coefficient $x_{1} \times 10^{2}$ α в Toluene; C₇H₈; .108-88-3 297.15 1.41 3.00 3.17 1,4-Dimethylbenzene; C₈H₁₀; 106-42-3 273.15 3.11 3.28 1.67 302.15 1.55 2.80 2.95 Dimethylbenzene Isomer Mixture; C₈H₁₀; 1330-20-7 0.743 305.15 1.38 1.46 1,3,5-Trimethylbenzene (Mesitylene); C_9H_{12} ; 108-67-8 293.15 1.45 2.39 2.52 The authors define the absorption coefficient as the volume of gas, corrected to 288.15 K and 101.325 kPa, absorbed under a total system pressure of 101.325 kPa per unit volume of solvent at 288.15 K. The mole fraction solubilities and Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Absorption coefficient determined 1. Xenon. Matheson Co., Inc. by a modified McDaniel method (1). Technical grade. 2. Solvents. Source not given. Chemically pure grade except dimethylbenzene isomers which were technical grade. ESTIMATED ERROR: $\delta\beta/\beta = 0.05 - 0.10$ **REFERENCES:** Furman, N.H. "Scott's Standard 1. Methods of Chemical Analysis" Van Nostrand Co., NY 1939, 5th ed., Vol. II, p. 2587.

COMPONENTS :	ORIGINAL MEASUREMENTS:	
1. Xenon; Xe; 7440-63-3	Steinberg, M.; Manowitz, B.	
2. Amsco 123-15		
	Ind. Eng. Chem. 1959, 51, 47-50.	
	<u>ina</u> . <u>big</u> . <u>chem</u> . 1999, <u>51</u> , 47-90.	
VARIABLES:	PREPARED BY:	
т/к: 294.15 - 423.15	PREPARED BY:	
P/kPa: 101.325 (1 atm)	P.L. Long	
EXPERIMENTAL VALUES:		
Xenon at 1 atr	Xenon at low conc in N ₂	
Coefficient Cons	y's Xenon Henry's tant Initial Constant tm ppm in N ₂ K/atm	
294.15 3.39 -		
	.0 662 33.4	
333.15 1.60 67	.0 655 63.0	
383.15 1.18 90 423.15 0.76 139	0.0 659 97.5 0.0 1070 157.0	
AUXILIARY	INFORMATION	
	INFORMATION SOURCE AND PURITY OF MATERIALS:	
METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc.	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral</pre>	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration</pre>	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, 	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and gives an enthalpy of solution of</pre>	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. 	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and</pre>	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. 	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and gives an enthalpy of solution of</pre>	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. 	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and gives an enthalpy of solution of</pre>	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. ESTIMATED ERROR:</pre>	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and gives an enthalpy of solution of</pre>	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. ESTIMATED ERROR:</pre>	
<pre>METHOD/APPARATUS/PROCEDURE: The absorption coefficient at one atm xenon was measured by modified McDaniel method (1). The Henry's constant (K = (P/atm)/X₁) at low concentration of xenon was measured by static and dynamic tracer techniques. The authors state that log (Absorp- tion Coefficient vs 1/T is linear and gives an enthalpy of solution of</pre>	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Amsco 123-15. American Mineral Spirits Co. No. 140. Paraffin 59.6 wt %, naphthene 27.3 wt %, aromatics 13.2 wt %. ESTIMATED ERROR:</pre>	

000700000			ODICINAL NO		
COMPONENTS: 1. Xenon; Xe; 7440-63-3				ASUREMENTS:	
1. Xenon; Xe; /440-6	3-3		Komarenko	, V.G.; Manzhe	elli, V.G.
2. 1-Propanol; C ₃ H ₈ C	; 71-23-8				
			<u>Ukr.Fiz.Z</u> <u>Ukr</u> .Phys	$\frac{1}{10}$. (<u>Ukr.Ed.</u>) 19 $\frac{1}{10}$. <u>J</u> . 1968, <u>13</u> ,	968, <u>13</u> ,387-391. , 273-276.
VARIABLES:			PREPARED BY	<i>(</i> :	
T/K: 193.15 P/kPa: 26.664				T.D. Kittredo	ie
,					
EXPERIMENTAL VALUES:					
			ion Mol 200 P/mm		
				$\times 10^2$	
				<u> </u>	
		2.20 1.648	2	8.36 6.262	
	213.15	1.183	3	4.495	
	223.15	0.862	2	3.28 2.52	
	233.15 243.15	0.515	5	1.96	
Smoothed Data: 1n X	= 188.924 - 100	262.1	26/(Ͳ/100) - 249.815 lr	(T/100)
	+ 56.3087			, 249.013 II	. (1/10)
				11	······································
T/K Mol Fraction $X_1 \times 10^2$	AG /KJMOI -	ΔH-/	KJMOI -	AS /JK mol -	ΔCp ^O /JK ⁻¹ mol ⁻¹
					- <u></u> -
193.15 8.38	3.982	-	-8.58	-65.04	-268.5
203.15 6.215 213.15 4.515	4.692	-1	LU.80 L2.08	-82.42	-174.9 -81.24
223.15 3.31	6.325		12.42	-84.02	+12.39
233.15 2.49 243.15 1.97	7.156 7.942		L1.83 L0.30	-81.44 -75.03	+106.0 +199.7
The mole fraction solubility at 101.325 kPa (760 mmHg) was calculated by Henry's law by the compiler.				as calculated	
	AUXII	LIARY	INFORMATION	1	
METHOD/APPARATUS/PROC	EDURE:		SOURCE AND	PURITY OF MATERI	ALS:
The solvent was d				n. Source not	
vacuum. A thin laye cooled to 125-175 K		20		ty by chromato 99.85 per cent	ographic method
hours in a vacuum ma				-	
mmHg. The degassed ligu	id was sealed			opanol. Purif	
under vacuum in an a	mpoule which w	was	Res.	Inst. for Sir	ngle Crystals &
placed in the appara tus consisted of a m				-Purity Substa 7 weight per o	
cury compensator, an	d a solubility	Y		.	
cell divided by a me gas pressure of 200		A			
temperature were established. The		ESTIMATED	ERROR:		
foil ends of the ampoule were pierced. The gas dissolved as the			$\delta T/K = 0$		
liquid flowed through	h a series of			$\frac{\delta P}{mmHg} = 0$ $\frac{\delta X_1}{X_1} = 0$	
small cups. The amo solved was determine					
mercury level in the	compensator.		REFERENCES	5:	
Some measurements mmHg gas pressure.					
firmed that Henry's					
			l		

COMPONENTS :	ORIGINAL MEASUREMENTS:		
1. Xenon; Xe; 7440-63-3	Steinberg, M.; Manowitz, B.		
2. Acetic Acid; C ₂ H ₄ O ₂ ; 64-19-7			
	Ind. Eng. Chem. 1959, 51, 47-50.		
	<u>Ind</u> . <u>Ind</u> . <u>Chem</u> . 1955, <u>51</u> , 47-50.		
VARIABLES: T/K: 301.15	PREPARED BY:		
P/kPa: 101.325 (1 atm)	H.L. Clever		
EXPERIMENTAL VALUES:			
T/K Mol Fraction	Bunsen Absorption		
$x_{1} \times 10^{2}$	Coefficient Coefficient		
<u> </u>	1.02 1.08		
	1.02 1.08		
The authors define the Absorption Coef rected to 288.15 K and 101.325 kPa, ab of 101.325 kPa per unit volume of solv	sorbed under a total system pressure		
The mole fraction solubility and Bun	sen coefficient were calculated by		
the compiler.			
	INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS;		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade.		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. 		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	 SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. 		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR: $\delta\beta/\beta = 0.05 - 0.10$ REFERENCES: 1. Furman, N.H. "Scott's Standard Methods of Chemical Analysis" Van Nostrand Co., NY 1939,		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR: $\delta\beta/\beta = 0.05 - 0.10$ REFERENCES: 1. Furman, N.H. "Scott's Standard Methods of Chemical Analysis" Van Nostrand Co., NY 1939,		
METHOD/APPARATUS/PROCEDURE: Absorption coefficient determined	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon. Matheson Co., Inc. Technical grade. 2. Acetic acid. Source not given. ESTIMATED ERROR:</pre>		

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Clever, H.L.; Saylor, J.H.;
	Gross, P.M.
2. Undecafluoro(trifluoromethyl)-	
cyclohexane (Perfluoromethyl- cyclohexane); C ₇ F ₁₄ ; 355-02-2	
7^{14}	J. Phys. Chem. 1958, 62, 89-91.
VARIABLES:	PREPARED BY:
т/к: 289.15 - 316.25	
Total P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
	Coefficient Coefficient
$x_{1} \times 10^{2}$	
	α L
289.15 1.86	2.20 2.33
303.15 1.61	1.86 2.06
316.25 1.43	1.62 1.87
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln$	$x_1 = -7375.1 + 58.643 \text{ T}$
Std. Dev. $\Delta G^{\circ} = 3.9$, C	
$510. \text{ Dev. } \Delta G = 3.9, C$	0 -1 -1
$\Delta H^{2}/J \mod f = -7375.1,$	$\Delta s^{\circ}/J K^{-1} mol^{-1} = -58.643$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ x	102
288.15 1.8 293.15 1.7	
298.15 1.6	
303.15 1.6	
308.15 1.5	
313.15 1.4	
318.15 1.4	11,282
The solubility values were adjusted to	a partial programa of yopon of
101.325 kPa (1 atm) by Henry's law.	a partial pressure of xenon of
The Bunsen coefficients were calculate	d by the compiler.
AUXILIARY	INFORMATION
	· · · · · · · · · · · · · · · · · · ·
METHOD:	SOURCE AND PURITY OF MATERIALS:
Volumetric. The apparatus (1) is	1. Xenon. Matheson Co., Inc. Both
a modification of that used by	standard and research grades
Morrison and Billett (2). Modifica- tions include the addition of a	were used.
spiral solvent storage tubing, a man-	2. Perfluoromethylcyclohexane.
ometer for constant reference pres-	du Pont FCS-326, shaken with con-
sure, and an extra gas buret for	centrated H ₂ SO ₄ , washed, dried
highly soluble gases.	over Drierite and distilled.
	b.p. 75.95 to 76.05° at 753 mm.,
	lit. b.p. 76.14 at 760 mm.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	$\delta T/K = 0.05$
(a) Degassing. 700 ml of solvent is shaken and evacuated while attached	$\delta P/mmHg = 3$
to a cold trap, until no bubbles are	$\delta X_1 / X_1 = 0.03$
seen; solvent is then transferred	
through a 1 mm capillary tubing, re-	REFERENCES:
leased as a fine mist into a continu-	1. Clever, H.L.; Battino, R.;
ously evacuated flask. (b) Solvent	Saylor, J.H.; Gross, P.M.
is saturated with gas as it flows	<u>J. Phys. Chem. 1957, 61</u> , 1078.
through 8 mm x 180 cm of tubing at-	
tached to a gas buret. Pressure is	2. Morrison, T.J.; Billett, F.
maintained at 1 atm as the gas is absorbed.	J. Chem. Soc. 1948, 2033;
ansorned.	<u>ibid</u> . 1952, 3819.

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS:	
· · · · · · · · · · · · · · · · · · ·	Steinberg, M.; Manowitz, B.; Pruzansky, J.	
<pre>2. Dichlorodifluoromethane (Freon-12); CCl₂F₂; 75-71-8</pre>	US AEC BNL-542 (T-140).	
	<u>Chem. Abstr. 1959, 53, 21242g.</u>	
VARIABLES:	PREPARED BY:	
т/к: 196.15 - 273.15	H. L. Clever	
1/1: 190.13 - 2/3.15	n. L. Clever	
EXPERIMENTAL VALUES:	I	
	Fraction Bunsen Ostwald	
Coefficient Constant K/atm	1×10^2 Coefficient Coefficient α L	
196.15 55.3	14.7 52.4 37.6	
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	12.7 3.6	
273.15 7.4 37.	2.7 7.0 7.0	
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln$	$X_1 = -9,778.5 + 65.508 T$	
Std. Dev. $\Delta G^{\circ} = 87$, Co		
$\Delta H^{O}/J \text{ mol}^{-1} = -9,778.5$	$\Delta S^{O}/J \kappa^{-1} mol^{-1} = -65.508$	
T/K Mol Fra	ction $\Delta G^{O}/J \text{ mol}^{-1}$	
X ₁ x		
<u></u>		
193.15 16. 203.15 12.	•	
213.15 9. 223.15 7.	43 4,184.6 36 4,839.6	
	87 5,494.7	
	77 6,149.8 94 6,804.9	
	31 7,460.0	
273.15 2.	81 8,115.0	
AUXILIARY	INFORMATION	
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
Dynamic tracer technique (1).	1. Xenon.	
The Henry's constant is	2. Dichlorodifluoromethane.	
$K = (P/atm)/X_1$		
The Henry's constants are probably from data smoothed by the authors.		
The report is discussed further in a later paper (2).		
	ESTIMATED ERROR:	
	$\delta x/x = 0.03 - 0.05$	
	(Compiler)	
	REFERENCES:	
	 Steinberg, M.; Manowitz, B. <u>Ind. Eng. Chem</u>. 1959, <u>51</u>, 47. 	
	2. Steinberg, M. US AEC TID-7593, 1959, 217. Chem Abstr 1961 55 2083e	
	<u>Chem</u> . <u>Abstr</u> . 1961, <u>55</u> , 9083e.	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Xenon; Xe; 7440-63-3	Linford, R.G.; Hildebrand, J.H.	
<pre>2. 1,1,2-Trichloro-1,2,2-trifluoro- ethane (Freon 113); C₂Cl₃F₃; 76-13-1</pre>	<u>Trans. Faraday Soc</u> . 1970, <u>66</u> , 577-581.	
VARIABLES: T/K: 284.37 - 298.15 P/kPa: 101.325 (1 atm)	PREPARED BY: P.L. Long	
EXPERIMENTAL VALUES:	J	
T/K Mol Fraction	Bunsen Ostwald	
$\frac{x_1 \times 10^2}{284.37} = 2.568$	Coefficient Coefficient $\frac{\alpha}{5.03}$ 5.24	
287.75 2.447	4.76 5.01	
290.40 2.362	4.36 4.64	
295.09 2.230 298.15 2.149	4.28 4.62 4.11 4.49	
<u> </u>		
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT lr$	и X ₁ = -9060.7 + 62.327 т	
Std. Dev. $\Delta G^{\circ} = 3.9$,		
$\Delta H^{0}/J \text{ mol}^{-1} = -9060.7$	7, $\Delta s^{\circ}/J \ \kappa^{-1} \ mol^{-1} = -62.327$	
	α action $\Delta G^{O}/J \text{ mol}^{-1}$	
283.15 2.6		
288.15 2.4		
293.15 2.2 298.15 2.1		
The Bunsen and Ostwald coefficients v		
AUXILIARY	INFORMATION	
METHOD.	COURCE AND DUDING OF MATERIALS.	
METHOD: Saturation of liquid with gas at a partial pressure of gas equal to l atm.	SOURCE AND PURITY OF MATERIALS: 1. Xenon. Source not given. Purest commercially obtainable, dried before use.	
	 1,1,2-Trichloro-1,2,2-trifluoro- ethane. Matheson, Coleman and Bell. Spectroquality. 	
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE:		
Dymond-Hildebrand apparatus (1) which uses an all-glass pumping sys- tem to spray slugs of degassed	$\delta x_1 / x_1 = 0.005$ (Evaluator)	
solvent into the gas. The amount of	REFERENCES:	
gas dissolved is calculated from initial and final pressures.	<pre>1. Dymond, J.H.; Hildebrand, J.H. Ind. Eng. Chem. Fundam. 1967, 6, 130.</pre>	

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Yagi, M.; Kondo, K.
 Inches, he, file in the second second	<u>Kakuriken Kenkyu Hokoku</u> 1969, 2(2), 153-154. Chem. Abstr. 1971, <u>75</u> , 54017c.
VARIABLES:	
T/K: room temperature P/kPa: 1.333 - 49.329 (10 - 370 mmHg)	PREPARED BY: H.L. Clever
EXPERIMENTAL VALUES: T/K Mol Frac	- · · · · · · · · · · · · · · · · · · ·
x ₁ × 1 at 101.32	
298.15(?) 1.11	6.84 x 10 ⁴
The mole fraction solubility at 101.32 the compiler.	25 kPa (l atm) was calculated by
Seven solubility measurements in degas ments in non-degassed trichloromethane fell within experimental error of the bilities were given on a graph along w	Henry's law line. The ten solu-
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE: The solvent was degassed by vacuum at liquid N ₂ temperature. 10 ml. gas and 5 ml. solvent were equilibrated for two hours at room temperature.	<pre>Source AND PURITY OF MATERIALS: 127 1. Xenon. Mixed tracer of 127 xe, 133xe, 133mxe, 135xe, 135mxe, separated from parent 133I and 135I. 2. Tetrachloromethane. No information.</pre>
	ESTIMATED ERROR: $\delta T/K = 2$ $\delta K/K = 0.05$ REFERENCES:

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Yagi, M.; Kondo, K.
2. Tetrachloromethane (Carbon Tetrachloride); CCl ₄ ; 56-23-5	<u>Kakuriken Kenkyu Hokoku</u> 1969, <u>2(2), 153-154.</u> Chem. Abstr. 1971, <u>75</u> , 54017c.
VARIABLES:	PREPARED BY:
T/K: room temperature	H.L. Clever
P/kPa: 1.333 - 49.329 (10 - 370 mmHg)	
	ction Henry's Constant
Х, х	10^2 K = P ₁ (mmHg)/X ₁
at 101.3	25 kPa
298.15(?) 1.3	52 5.75 x 10 ⁴
The mole fraction solubility at 101.32 compiler.	?5 kPa (l atm) was calculated by the
Nine solubility measurements in degass in non-degassed tetrachloromethane bet fell within experimental error of the solubilities were given on a graph alc	ween 10 and 370 mmHg Xe pressure
Abstr. 1956, $\frac{50}{00}$, 16284e] used the McD coefficients of xenon in carbon tetra Their values are T/K/Ostwald: $301/2.4$ The values range from 0.94 x 10^{-2} to a pressure of 101.325 kPa. The value by 15 to 30 percent, is probably a mo	The chloride at several temperatures. 1, 304/2.3 and 2.9, and $305/2.4.1.13 \times 10^{-2} mole fraction xenon atof Yagi and Kondo, which is higher$
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by vacuum at liquid N ₂ temperature. 10 ml. gas and	1. Xenon. Mixed tracer of 127 Xe , $129^{\text{m}} \text{ Xe}$, $133^{\text{m}} \text{ Xe}$, 135^{Xe} ,
5 ml. solvent were equilibrated for two hours at room temperature.	^{135m} xe, separated from parent ¹³³ I and ¹³⁵ I.
	2. Tetrachloromethane. No information.
	ESTIMATED ERROR:
	REFERENCES :

	• ····································
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Saylor, J.H.; Battino, R.
2. Fluorobenzene; C ₆ H ₅ F; 462-06-6	
6-5,	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 1334-1337.
VARIABLES:	PREPARED BY:
T/K: 288.35 - 328.15	
P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald
1 -	Coefficient Coefficient
$X_1 \times 10^2$	a L
$\frac{1}{288.35}$ $\frac{1}{1.479}$	3.598 3.798
298.15 1.298	3.069 3.350
313.15 -	
328.15 0.985	2.274 2.732
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln$	$X_1 = -7897.3 + 62.504 T$
Std. Dev. $\Delta G^{O} = 28.0$,	Coeff. Corr. =0.9998
	$\Delta S^{\circ}/J K^{-1} mol^{-1} = -62.504$
1 '	action $\Delta G^{O}/J \text{ mol}^{-1}$
x, x	10 ²
$\frac{1}{288.15}$ $\frac{1}{1.4}$	
293.15 1.3	
298.15 1.3	
303.15 1.2	
308.15 1.1	
313.15 1.1 318.15 1.0	
323.15 1.0	
328.15 0.9	
Solubility values were adjusted to a p	partial pressure of yenon of
101.325 kPa (1 atm) by Henry's law.	Bunsen coefficients were
calculated by the compiler.	
	INFORMATION
	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evacu-	1. Xenon. Linde Air Products Co.
ating the space above it, shaking, and	
then passing it as a fine mist into	2. Fluorobenzene. Eastman Kodak Co.,
another evacuated container. The de-	white label. Dried over P4010,
gassed liquid was saturated as it passed as a thin film inside a glass	distilled, b.p. 84.28 - 84.68 ^o C.
helix which contained the solute gas	aistified, b.p. 84.28 = 84.00 C.
plus solvent vapor at a total pressure	
of 1 atm (1,2). The volume of liquid	
and the volume of gas absorbed are	
determined directly in a system of burets.	
Dut 610.	ECTIMATED EDDOD.
	ESTIMATED ERROR: $\delta \pi / \kappa = 0.02$
	$\delta T/K = 0.03$ $\delta P/mmHg = 1.0$
	$\delta X_1 / X_1 = 0.005$ (authors)
	REFERENCES:
	1. Morrison, T.J.; Billett, F.
	J. Chem. Soc. 1948, 2033.
	2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
	J. Phys. Chem. 1957, <u>61</u> , 1078.

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Saylor, J.H.; Battino, R.
	bayror, 0.m.; Battino, K.
2. Chlorobenzene; C ₆ H ₅ Cl; 108-90-7	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 1334-1337.
VARIABLES: T/K: 288.35 - 328.15 P/kPa: 101.325 (1 atm)	PREPARED BY: H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	BunsenOstwaldCoefficientCoefficientαL3.1153.288
288.35 1.390	3.115 3.289
298.15 - 313.15 -	
328.15 0.894	1.918 2.304
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln I$	$X_{2} = -8724.1 + 65.806 T$
	1
$\Delta H^{0}/J m 01^{-1} = -8724.1,$	$\frac{\Delta S^{\circ}/J \ \kappa^{-1} \ \text{mol}^{-1}}{\text{ction} \ \Delta G^{\circ}/J \ \text{mol}^{-1}} = -65.806.$
	10 ²
	9 10238 1 10567
298.15 1.2	3 10896
303.15 1.1	6 11225
308.15 1.1 313.15 1.0	
318.15 0.9	88 12212
323.15 0.9 328.15 0.8	39 12541 94 12870
Solubility values were adjusted to a p 101.325 kPa (1 atm) by Henry's law. E calculated by the compiler.	artial pressure of ×enon of
AUXILIARY	INFORMATION
	······
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evacu- ating the space above it, shaking, and then passing it as a fine mist into another evacuated container. The de- gassed liquid was saturated as it passed as a thin film inside a glass helix which contained the solute gas plus solvent vapor at a total pres- sure of 1 atm (1,2). The volume of liquid and the volume of gas absorbed are determined in a system of burets.	2. Chlorobenzene. Eastman Kodak Co., white label. Dried over P ₄ O ₁₀ , distilled, b.p. 131.67 - 131.71 ^o C.
	ESTIMATED ERROR: $\delta \pi / V = 0.03$
The smoothed data above are based on only two experimental points. They should be used with caution.	$\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ $\delta X_1/X_1 = 0.005$ (authors)
	REFERENCES: 1. Morrison, T.J.; Billett, F. <u>J. Chem</u> . <u>Soc</u> . 1948, 2033.
	 Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. J. Phys. Chem. 1957, 61, 1078.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Saylor, J.H.; Battino, R.
2. Bromobenzene; C ₆ H ₅ Br; 108-86-1	
	J. Phys. Chem. 1958, 62, 1334-1337.
VARIABLES: T/K: 288.35 - 328.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_{1} \times 10^{2}$	a L
$\frac{1}{288.35}$ $\frac{1}{1.222}$	2.651 2.798
298.15 1.057	2.270 2.478
313.15 - 328.15 0.824	1.716 2.062
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - R^{T} \ln C$	$x_1 = -/531.6 + 62.$
	4, Coeff. Corr. = 0.9992
	$\Delta S^{\circ}/J K^{-1} mol^{-1} = -62.$
T/K Mol Fra	
x ₁ ×	102
	20 10591 14 10906
	08 11220
	11535
	980 11849 936 12164
318.15 0.1	-
323.15 0.1 328.15 0.1	355 12793 320 13107
Solubility values were adjusted to a p 101.325 kPa (1 atm) by Henry's law.	
calculated by the compiler.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evaqu-	1. Xenon. Linde Air Products Co.
ating the space above it, shaking, and	
then passing it as a fine mist into	2. Bromobenzene. Eastman Kodak Co.,
another evacuated container. The de- gassed liguid was saturated as it	white label. Dried over P ₄ 0 ₁₀ ,
passed as a thin film inside a glass	distilled, b.p. 155.86 -
helix which contained the solute gas plus solvent vapor at a total pres-	155.90 [°] C.
sure of 1 atm (1,2). The volume of	
liquid and the volume of gas absorbed	
are determined in a system of burets.	
	ESTIMATED ERROR:
	$\delta T/K = 0.03$
	$\delta P/mmHg = 1.0$
	$\delta x_1 / x_1 = 0.005 \text{ (authors)}$
	REFERENCES:
	1. Morrison, T.J.; Billett, F.
	J. Chem. Soc. 1948, 2033.
	2. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.
	J. Phys. Chem. 1957, 61, 1078.

COMPONENTS : ORIGINAL MEASUREMENTS: Xenon; Xe; 7440-63-3 1. Saylor, J.H.; Battino, R. Iodobenzene; C₆H₅I; 591-50-4 J. Phys. Chem. 1958, 62, 1334-1337. VARIABLES: PREPARED BY: т/к: 288.65 - 328.15 P/kPa: 101.325 (1 atm) H.L. Clever, A.L. Cramer EXPERIMENTAL VALUES: T/K Bunsen Mol Fraction Ostwald Coefficient Coefficient $x_1 \times 10^2$ α Τ. 0.968 288.65 1.972 2.084 298.15 -313.15 0.682 1.608 1.338 328.15 $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln X_{1} = -6982.2 + 62.748 T$ Smoothed Data: $\Delta H^{\circ}/J \text{ mol}^{-1} = -6982.2, \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -62.748$ T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ $x_1 \times 10^2$ 288.15 0.973 11,099 293.15 0.926 11,412 298.15 0.882 11,726 303.15 0.842 12,040 308.15 12,354 0.805 313.15 12,667 0.771 318.15 0.739 12,981 323.15 0.709 13,295 328.15 13,609 0.682 Solubility values were adjusted to a partial pressure of xenon of 101.325 kPa (l atm) by Henry's law. Bunsen coefficients were calculated by the compiler. AUXILIARY INFORMATION SOURCE AND PURITY OF MATERIALS: METHOD /APPARATUS/PROCEDURE: 1. Xenon. Linde Air Products Co. The solvent was degassed by evacuating the space above it, shaking, and 2. Iodobenzene. Eastman Kodak white then passing it as a fine mist into label. Shaken with aq. Na2S203, another evacuated container. The degassed liquid was saturated as it dried over P4010, distilled, passed as a thin film inside a glass b.p. 77.40 - 77.60°C (20 mmHg). helix which contained the solute gas plus solvent vapor at a total pressure of 1 atm (1,2). The volume of liquid and the volume of gas absorbed are determined in a system of burets. ESTIMATED ERROR: $\delta T/K = 0.03$ $\delta P/mmHg = 1.0$ The smoothed data above are based on $\delta X_{1} / X_{1} = 0.005$ (authors) only two experimental points. They should be used with caution. **REFERENCES**: 1. Morrison, T.J.; Billett, F. J. Chem. Soc. 1948, 2033. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P. M. J. Phys. Chem. 1957, 61, 1078.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Ackley, R.D.; Notz, K.J.
133	Oak Ridge Natl. Lab.
¹³³ xe; 14932-42-4	Oak Ridge, TN 37830
2. Carbon dioxide; CO ₂ ; 124-38-9	ORNL-5122, October 1976
2. calbon aloxide, co_2 , 124 50 5	Aval. Nat'l. Tech. Infor. Service
	Chem. Abstr. 1977, 86, 178229v.
VARIABLES:	PREPARED BY:
T/K: 218.35 - 303.65	A.L. Cramer H.L. Clever
	n.L. Ciever
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_{1} \times 10^{2}$	
223.15 2.22	13.33 10.89
233.15 1.95	11.26 9.61
243.15 1.73	9.62 8.56
253.15 1.53	8.15 7.55
263.15 1.37	6.94 6.69
273.15 1.23 283.15 1.15	5.88 5.88 5.11 5.30
293.15 1.12	5.11 5.30 4.43 4.75
298.15 1.14	4.12 4.50
303.15 1.17	3.69 4.10
	c values for the transfer of one mole to the hypothetical unit mole fraction
xenon liquid is on the next page.	c values for the transfer of one mole to the hypothetical unit mole fraction Y INFORMATION
xenon liquid is on the next page. AUXILIAR	to the hypothetical unit mole fraction
xenon liquid is on the next page. AUXILIAR METHOD:	to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS:
xenon liquid is on the next page. AUXILIAR METHOD: Tracer technique (2). Corrected	to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs.
AUXILIAR METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation.	TO THE hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade.
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated	TY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL.
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a	TO THE hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade.
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the	TY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL.
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	AY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co.,
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent.</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent.</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>XY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>
AUXILIAN METHOD: Tracer technique (2). Corrected for 5.27 day half-life attenuation. Collimated counter with equilibrated gas-liquid samples. Xenon gas was a mixture of Xenon-133 and research grade Xe. The total pressure of the system was the equilibrium pressure of liquid CO ₂ + the Xe pressure.	<pre>to the hypothetical unit mole fraction Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon. Cryogenic Rare Gas Labs. Ultra high purity grade. Xenon-133. Isotopes Div., ORNL. 2. Carbon dioxide. Matheson Co., Inc. Research grade, 99.5 mol percent. ESTIMATED ERROR:</pre>

			EASUREMENTS :		
1. Xenon; Xe; 7440-63	-3	Ackley,	R.D.; Notz, K.C	J.	
¹³³ xe; 14932-4	2-4	ORNL-512 Aval. Na	2, October 1976 t'l. Tech. Info	or. Service	
2. Carbon Dioxide; CO	2; 124-38-9				
VARIABLES:		PREPARED B			
T/K: 218.35 - 303.65			A.L. Cramer H.L. Clever		
EXPERIMENTAL VALUES:					
T/K Mol Fraction $X_1 \times 10^2$	∆G ^O /kJmol ⁻¹	ΔH ^O /kJmol ⁻¹	ΔS ^O /JK ⁻¹ mol ⁻¹	ΔCp ^O /JK ⁻¹ mol ⁻¹	
223.15 2.20	7.077	-3.795	-48.72	-215	
233.15 1.98 243.15 1.74	7.606	~5.556	-56.45	-138	
253.15 1.52	8.194 8.808	-6.547 -6.770	-60.63 -61.53	-60.7 +16.2	
263.15 1.35	9.415	-6.222	-59.43	93.2	
273.15 1.23	9.987	-4.907	-54.53	170	
283.15 1.16	10.497	-2.821	-47.04	247	
293.15 1.13 303.15 1.16	10.920 11.232	+0.033 3.657	-37.14 -24.99	324 401	
	AUXILI	ARY INFORMATIO	N		
METHOD:	AUXILI		N) PURITY OF MATERI.	ALS:	
METHOD: See preceding page	- <u></u>	SOURCE ANI		•	
	- <u></u>	SOURCE ANI	O PURITY OF MATERI.	•	
See preceding page	- <u></u>	SOURCE ANI	9 PURITY OF MATERI		
	- <u></u>	SOURCE ANI S ESTIMATED	9 PURITY OF MATERI	ıge	
See preceding page	- <u></u>	SOURCE ANI S ESTIMATED	PURITY OF MATERI ee preceding pa ERROR: ee preceding pa	ıge	
See preceding page	- <u></u>	SOURCE ANI S ESTIMATED S REFERENCE	PURITY OF MATERI ee preceding pa ERROR: ee preceding pa	ığe	

	ORIGINAL MEASUREMENTS:
L. Xenon; Xe; 7440-63-3	Powell, R.J.
2. Carbon Disulfide; CS ₂ ; 75-15-0	
Z	<u>J</u> . <u>Chem</u> . <u>Eng</u> . <u>Data</u> 1972, <u>17</u> , 302-304.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	I
T/K Mol Fraction Bunse	n Ostwald R $\frac{\Delta \log x}{\Delta \log T} = N$
$x_1 \times 10^2$ coefficiency α	L
298.15 1.042 3.89	4.25 -9.08
308.15, but only the solubility at 298 ($\Delta \log x_1/\Delta \log T$) was given. The smothe compiler from the slope in the for	othed data below were calculated by m:
$\log x_1 = \log (1.042 \times 10^{-2})$	+ (-9.08/R)log(T/298.15)
with $R = 1.9872$ cal K^{-1} mol ⁻¹ .	
Smoothed data: T/K M	ol Fraction
	$x_1 \times 10^2$
273.15	1.555
278.15 283.15	1.431 1.319
288.15	1.218
293.15 298.15	1.126 1.042
303.15	0.9657
The Bunsen and Ostwald Coefficients we	re calculated by the compiler.
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solvent is degassed by freezing and pumping, then boiling under reduced pressure. The Dymond and Hildebrand (1) apparatus, with all glass pumping	 Xenon. No source. Manu- facturer's research grade, dried over CaCl₂ before use.
system, is used to spray slugs of de- gassed solvent into the xenon. Amount of gas dissolved is calculated from the initial and final gas pressures.	 Carbon disulfide. No source. Manufacturer's spectrochemical grade.
	ESTIMATED ERROR: $\delta \text{ N /cal } \text{K}^{-1} \text{ mol}^{-1} = 0.1$ $\delta \text{X}_{1}/\text{X}_{1} = 0.002$
	REFERENCES:
	REFERENCES: 1. Dymond, J.; Hildebrand, J.H. <u>Ind. Eng. Chem. Fundam</u> . 1967, <u>6</u> , 130.

COMPONENTS :		ORIGINAL MEASU	IDEMENTE .
	40.62.2		
1. Xenon; Xe; 74		Dymond, J.	n.
2. Sulfinylbisme	thane (Dimethyl Sulf-		
	s (CH ₃ SOCH ₃); 67-68-5	J. Phys. C	hem. 1967, <u>71</u> , 1829-1831.
VARIABLES:		PREPARED BY:	
т/к: 2	98.15		M. E. Derrick
P/kPa: 1	01.325 (1 atm)		
EXPERIMENTAL VALUES:			
	T/K Mol Fraction	Bunsen	Ostwald
	$x_1 \times 10^2$	Coefficient a	Coefficient L
	98.15 0.170	0.535	0.584
The Bunsen and Os	twald coefficients we	re calculate	d by the compiler.
		INFORMATION	
/ / / / / //			
METHOD/APPARATUS/F	PROCEDURE:	SOURCE AND PU	RITY OF MATERIALS:
	aturated with the	1. Xenon.	Matheson Co., Dried.
gas at a gas part l atm.	al pressure of	2. Dimethy	vl Sulfoxide. Matheson,
The apparatus i	s that described by	Colemar	n, and Bell Co. Spectro-
Dymond and Hildeb	orand (1). The all-glass pumping	quality fractio	y reagent, dried, and a on frozen out. Melting
system to spray s	lugs of degassed		3.37° C.
solvent into the	gas. The amount of calculated from the		
initial and final			
1			
		ESTIMATED ERR	OR:
		1	
		REFERENCES:	
		1. Dymond	, J.; Hildebrand, J. H.
		1. Dymond	ng. Chem. Fundam. 1967,
		1. Dymond, Ind. Er	ng. Chem. Fundam. 1967,
		1. Dymond, Ind. Er	ng. Chem. Fundam. 1967,

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Powell, R.J.
2. 1,1,2,2,3,3,4,4,4-nonafluoro-N,N- bis(nonafluorobuty1)-1-butanamine	<u>J. Chem. Eng. Data</u> 1972, <u>17</u> , 302-304.
VARIABLES:	PREPARED BY:
T/K: 298.15 P/kPa: 101.325 (1 atm)	P.L. Long
EXPERIMENTAL VALUES:	
T/K Mol Fraction Bunse Coeffic $X_1 \times 10^2$ α	n Ostwald R $\frac{\Delta \log x}{\Delta \log T}$ = N L
298.15 2.152 1.38	1.51 -5.01
compiler from the slope in the form:	.15 was given in the paper. The slope thed data below were calculated by the -2) + (-5.01/R)log(T/298.15)
Smoothed data:	
T/K M	$x_1 \times 10^2$
288.15	2.345
293.15	2.246
298.15 303.15	2.152 2.064
308.15	1.980
313.15 318.15	1.901 1.827
The Bunsen and Ostwald Coefficients we	ere calculated by the compiler.
	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Solvent is degassed by freezing and pumping, then boiling under re- duced pressure. The Dymond and	 Xenon. No source. Manu- facturer's research grade, dried over CaCl₂ before use.
Hildebrand (1) apparatus, with all glass pumping system, is used to spray slugs of degassed solvent into the xenon. Amount of gas dissolved is calculated from the initial and final gas pressures.	2. Perfluorotributylamine. Minnesota Mining & Mfg. Co. Column distilled, used portion with b.p. = 447.85 - 448.64K, & single peak GC.
	ESTIMATED ERROR:
	$\delta N / cal K^{-1} mol^{-1} = 0.1 \delta X_1 / X_1 = 0.002$
	REFERENCES:
	 Dymond, J.; Hildebrand, J.H. <u>Ind. Eng. Chem. Fundam</u>. 1967, <u>6</u>, 130.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Steinberg, M.; Manowitz, B.;
	Pruzansky, J.
2. Nitrous Oxide; N ₂ O; 10024-97-2	US AEC BNL-542 (T-140).
	<u>Chem</u> . <u>Abstr</u> . 1959, <u>53</u> , 21242g.
VARIABLES:	PREPARED BY:
m/v_{*} 102 15 - 242 65	H. L. Clever
T/K: 193.15 - 243.65	
EXPERIMENTAL VALUES:	
T/K Absorption Henry's Mol Coefficient Constant X K/atm	Fraction Bunsen Ostwald 1×10^2 Coefficient Coefficient α L
193.15 60.5	8.51 57.4 40.5 ₅
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
240.15 45	2.2
243.65 50	2.0
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = - RT \ln Q$	
Std. Dev. $\Delta G^{\circ} \approx 88.5$,	
	$\Delta S^{\circ}/J K^{-1} mol^{-1} = -80.501$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ x	10 ²
193.15 9.1	
203.15 6.3 213.15 4.6	37 4,650.9 50 5,455.9
223.15 3.4	6,260.9
233.15 2.6 243.15 2.0	
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Dynamic tracer technique (1).	1. Xenon.
The Henry's constant is	2. Nitrous oxide.
$K = (P/atm)/X_{1}$	
The Henry's constants are probably from data smoothed by the authors.	
The report is discussed further in a later paper (2).	
	"STIMATED ERROR:
	$\delta X/X = 0.03 - 0.05$
	(Compiler)
	<pre>L. Steinberg, M.; Manowitz, B. Ind. Eng. Chem. 1959, <u>51</u>, 47.</pre>
	 Steinberg, M. US AEC TID-7593, 1959, 217.
	<u>Chem</u> . <u>Abstr</u> . 1961, <u>55</u> , 9083e.

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COMPONENTS :					
		······	ORIGINAL MEAS	UREMENTS :	
1. Xenon; Xe;	; 7440-63-3	3	Friedman,	H.L.	
2. Nitrometha	ane; CH ₃ NO ₂	; 75-52-5			
			J. Am. Che 3294-3297.	<u>m. Soc</u> . 1954, <u>7</u>	<u>'6</u> ,
VARIABLES:	<u> </u>		PREPARED BY:	·····	
T/K: P/kPa:		(l atm)	P	.L. Long	
EXPERIMENTAL VALU	JES:			·····	<u>,</u>
	T/K M	Iol Fraction	Bunsen	Ostwald	
		$x_{1} \times 10^{3}$	a	Coefficient L	
	298.00			1.15 1.11 1.15	
	_	0.201	1.04	1.14 av.	
		AUXILIARY	INFORMATION		
METHOD:	<u></u>	AUXILIARY	····	JRITY OF MATERIALS	
METHOD: Gas absorpt essentially th and Herzberg (cluded a magne stead of shaki sel, and balan against a colu electrical con ancing the gas atmosphere.	hat employe (1). Modif etic stirri ing the sat ncing the g umn of merc ntacts inst	method was d by Eucken ications in- ung device in- curation ves- as pressure ury with tead of bal-	SOURCE AND PU 1. Xenon. Reagen pure b 2. Nitrom	Air Reduction t grade, 99.8 p y mass spectros ethane. Source led, dried by f	Co. er cent copy. not given.
Gas absorpt essentially th and Herzberg (cluded a magne stead of shaki sel, and balan against a colu electrical con ancing the gas	ure: The so ure: T	method was d by Eucken ications in- ing device in- uration ves- as pressure try with ead of bal- against the very with ead of bal- of solvent . Initial	SOURCE AND PU 1. Xenon. Reagen pure b 2. Nitrom Distil at 253 ESTIMATED ERM d REFERENCES: 1. Euken, <u>Z. Phy</u>	Air Reduction t grade, 99.8 p y mass spectros ethane. Source led, dried by f K.	G.

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Steinberg, M.; Manowitz, B.	
	Steinberg, M., ManOwitz, D.	
2. Benzenamine (Aniline); C ₆ H ₇ N; 62-53-3		
62-53-5	Ind. Eng. Chem. 1959, <u>51</u> , 47-51.	
VARIABLES:	PREPARED BY:	
т/К: 303.15	H.L. Clever	
P/kPa: 101.325 (1 atm)	A.L. Cramer	
EXPERIMENTAL VALUES: T/K Mol Fraction	Bunsen Absorption	
	Coefficient Coefficient α β	
303.15 0.173	0.43 0.45	
The authors define the Absorption coefficient as the volume of gas, cor- rected to 288.15 K and 101.325 kPa, absorbed under a total system pressure of 101.325 kPa per unit volume of solvent at 288.15 K.		
The mole fraction solubilities and Bun by the compiler.	nsen coefficients were calculated	
is about 9 per cent higher than the S	e reported by von Antropoff at 303.15 K teinberg and Manowitz value (see next to recommend one value over the other.	
······		
AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
Absorption coefficient determined by a modified McDaniel method (1).	 Xenon. Matheson Co., Inc. Technical grade. 	
	 Benzenamine. Source not given. Chemically pure grade. 	
	ESTIMATED ERROR:	
	$\delta\beta/\beta = 0.05 - 0.10$	
	REFERENCES :	
	1. Furman, N.H. "Scott's Standard	
	Methods of Chemical Analysis" Van Nostrand Co., NY, 1939, 5th ed., Vol. II, p. 2587.	

	_				
COMPONENTS:	440.60.0			L MEASUREMENTS:	
1. Xenon; Xe; 7			von	Antropoff, A.	
2. Benzenamine 62-53-3	(Aniline); C	6 ^H 7 ^N ;	<u>z</u> . <u>e</u>	lectrochem. 1	919, <u>25</u> , 269-308.
VARIABLES:	····		PREPARI	D BY.	
т/к: 28	3.15 - 323.15 1.325 (1 atm)			<i>D</i> D I .	
EXPERIMENTAL VALUES:				<u></u>	
Т/К	Kuenen Coefficient S	Mol Fra X ₁ ×		Bunsen Coefficient a	Ostwald Coefficient L
283.15 293.15 298.15	0.6687 0.5006 0.4758	0.27		0.689 0.512	0.714 0.549
298.15 298.15	0.4733	0.19	7	0.484	0.528
303.15 303.15	$0.4546 \\ 0.4426$	0.18	9	0.462	0.513
313.15 313.15	0.4336	0.17	9	0.434	0.498
323.15 323.15	0.3892 0.4113	0.17	1	0.411	0.486
$\begin{array}{c c} & & & & & & \\ & & & & & & \\ \hline & & & & &$	tion ΔG ^O /J m 0 ² 5 15,08 8 15,43 2 15,77	no1-1 39 31 72	Coef. , ΔS ^O / T/K 313.15 318.15 323.15	$\frac{X_1 \times 10^2}{0.180}$	
	······································	AUXILIARY	INFORMA	TION	
METHOD /APPARATUS/	PROCEDURE :		SOURCE	AND PURITY OF M	ATERIALS :
METHOD /APPARATUS/PROCEDURE: Gas absorption. A modification of the apparatus of Estreicher. A cali- brated buret connected to an absorp- tion vessel by a flexible glass helix so the absorption vessel can be shaken. Solvent degassed by heat and vacuum (1).		1. 2.	Xenon. Aniline was p	repared from aniline was freshly dis-	
			ESTIMA	TED ERROR:	
				$\delta S/S = 0.5$	03
				Estreicher, T	. 1899, <u>31</u> , 176.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Saylor, J.H.; Battino, R.
2. Nitrobenzene; C ₆ H ₅ NO ₂ ; 98-95-3	
6 5 2, 50 50 5	
	<u>J</u> . <u>Phys</u> . <u>Chem</u> . 1953, <u>62</u> , 1334-1337.
VARIABLES:	PREPARED BY:
T/K: 288.25 - 328.15 P/kPa: 101.325 (1 atm)	H.L. Clever, A.L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction	Bunsen Ostwald Coefficient Coefficient
$x_{1} \times 10^{2}$	α L
$\frac{1}{288.25}$ $\frac{1}{0.627}$	α L 1.388 1.465
312 15	
328.15 0.483	1.032 1.240
Smoothed Data: $\frac{313.13}{\Delta G^{\circ}/J \text{ mol}^{-1}} = - \text{ RT ln }$	$X_1 = -5143.0 + 60.012 T$
$\Delta H^{O}/J mol^{-1} = -5143.0$	$\Delta S^{O}/J K^{-1} mol^{-1} = -60.012$
T/K Mol Fra	$\frac{\Delta S^{\circ}/J \ \kappa^{-1} \ mol^{-1}}{ction \ \Delta G^{\circ}/J \ mol^{-1}} = -60.012$
x ₁ x :	10 ²
288.15 0.6	27 12,149
293.13 0.60	27 12,450 05 12,450 84 12,750 64 13,050 46 13,350 29 13,650 12 13,950 12 13,950
303.15 0.50 308.15 0.55	64 13,050
313.15 0.55 318.15 0.55	29 13,650
	12 13,950 97 14,250
$\frac{328.15}{0.44}$	97 14,250 33 14,550
Solubility values were adjusted to a pa 101.325 kPa (1 atm) by Henry's law. Bu	artial pressure of xenon of unsen coefficients were calculated
by the compiler.	
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The solvent was degassed by evacu-	1. Xenon. Linde Air Products Co.
ating the space above it, shaking, and then passing it as a fine mist into	2. Nitrobenzene. Eastman Kodak
another evacuated container. The de-	white label. Distilled from
gassed liquid was saturated as it passed as a thin film inside a glass	P_4O_{10} , b.p. $81.0 - 81.2$ °C
helix which contained the solute gas	(10 mmHg).
plus solvent vapor at a total pres- sure of 1 atm (1,2). The volume of	
liquid and the volume of gas absorbed are determined in a system of burets.	
and system of burges.	
	ESTIMATED ERROR: $\delta T/K = 0.03$
The smoothed data above are based on	$\delta P/mmHg = 1.0$
only two experimental points. They should be used with caution.	$\delta X_1 / X_1 = 0.005 \text{ (authors)}$
	REFERENCES:
	1. Morrison, T.J.; Billett, F.
	<u>J. Chem. Soc</u> . 1948, 2033.
	2. Clever, H.L.; Battino, R.;
	Saylor, J.H.; Gross, P.M. J. Phys. Chem. 1957, 61, 1078.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Xenon; Xe; 7440-63-3 Steinberg, M.; Manowitz, B. 2. Emulsions and Other Mixed Solvents Ind. Eng. Chem. 1959, 51, 47-50. VARIABLES: PREPARED BY: T/K: 292.15 - 305.15 P/kPa: 101.325 (1 atm) P.L. Long EXPERIMENTAL VALUES: T/K Absorption Coefficient β Koppers Emulsion K-900 (50 wt % styrene - butadiene in water) 305.15 0.95 Pine Oil 292.15 2.25 Toluene; C₇H₈; 108-88-3 297.15 3.17 Pine Oil (60 vol %) + Toluene (40 vol %) 298.15 2.55 Ultrasene (80 wt % paraffin, 20 wt % naphthene) 294.15 3.53 The authors define the Absorption Coefficient as the volume of gas, corrected to 288.15 K and 101.325 kPa, absorbed under a total system pressure of 101.325 kPa per unit volume of solvent at 288.15 K. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Xenon. Matheson Co., Inc. The absorption coefficients were 1. determined by a modified McDaniel Technical pure grade. method (1). Dynamic tracer technique was used 2. Ultrasene. Atlantic Refining Co. with the Ultrasene. No information given on other solvents. ESTIMATED ERROR: $\delta\beta/\beta = 0.05 - 0.10$ **REFERENCES:** Furman, N.H. "Scott's Standard Methods of Chemical Analysis" 1. Van Nostrand Co., NY 1939, 5th ed., Vol. II, p. 2587.

COMPONENTS : ORIGINAL MEASUREMENTS: 1. Xenon; Xe; 7440-63-3 Steinberg, M.; Manowitz, B. 2. Silicone Oils and Related Fluids Ind. Eng. Chem. 1959, 51, 47-50. **VARIABLES:** PREPARED BY: 297.15 - 368.15 T/K: P/kPa: 101.325 (1 atm) P.L. Long **EXPERIMENTAL VALUES:** T/K Absorption Coefficient ß Dow Corning Silicone Oil 200 (Dimethylsiloxane, 10 centistoke) 297.15 1.50 368.15 0.17 Dow Corning Silicone Oil 200 (Dimethylsiloxane, 1 centistoke) 303.15 2.45 Dow Corning Silicone Oil 702 (contains diphenyl groups) 300.15 0.93 Dow Corning Anti-Foam A (60 wt % silicone oil in water) 301.15 0.74 Dowtherm A (Diphenyl-Diphenyl Oxide) 301.15 0.88 The authors define the Absorption Coefficient as the volume of gas, corrected to 288.15 K and 101.325 kPa, absorbed under a total system pressure of 101.325 kPa per unit volume of solvent at 288.15 K. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: The absorption coefficient at one 1. Xenon. Matheson Co., Inc. atmosphere of xenon was measured by a Technical grade. modified McDaniel method (1). 2. Solvents. Dowtherm A from Dow Chemical Co. No statement about other solvents. ESTIMATED ERROR: $\delta\beta/\beta = 0.05 - 0.10$ **REFERENCES:** Furman, N.H. "Scott's Standard 1. Methods of Chemical Analysis" Van Nostrand Co., NY 1939, 5th ed., Vol. II, p. 2587.

COMPONENTS :	EVALUATOR:
1. Xenon; Xe; 7440-63-3	H. L. Clever Chemistry Department
2. Olive Oil	Emory University Atlanta, GA 30322 U.S.A.
	August 1978

CRITICAL EVALUATION:

The solubility of xenon in olive oil was measured by Lawrence, Loomis, Tobias and Turpin (1) at 295.15 and 310.15 K, by Yeh and Peterson (2) at 298.15, 303.15, 310.15 and 318.15 K and at 310.15 K by Ladefoged and Anderson (3) and by Kitani (4).

The data were converted to a mole fraction solubility at a partial pressure of xenon of 101.325 kPa (1 atm) assuming that olive oil is 1,2,3-propanetriyl ester of Z-9-octadecenoic acid, or triolein, of molecular weight 885.46. The data from the four laboratories shows considerable scatter. Yeh and Peterson made direct volumetric measurements at atmospheric pressure. The other workers used radiochemical techniques at low xenon partial pressure in the presence of a carrier gas, which can be subject to greater errors than the volumetric method. The data of Yeh and Peterson are internaly self-consistent. It was decided to accept the Yeh and Peterson data as tentative values of the xenon in olive oil solubility.

The Yeh and Peterson data were used in a linear regression of a Gibbs energy equation linear in temperature. The tentative values of the thermodynamic changes for the transfer of one mole of xenon from the gas at 101.325 kPa (1 atm) to the hypothetical unit mole fraction solution are

> $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln X_{1} = -8,733.3 + 50.649 T$ Std. Dev. = 4.9, Coef. Corr. = 0.9999 $\Delta H^{\circ}/J \text{ mol}^{-1} = -8,773.3, \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -50.649$

A table of tentative mole fraction solubility and Gibbs energy values as a function of temperature appears below.

TABLE 1. The solubility of xenon in olive oil. The tentative values of the mole fraction solubility at a xenon partial pressure of 101.325 kPa (1 atm) and the Gibbs energy change as a function of temperature.

т/к	Mol Fraction	ΔG ^O /J mol ⁻¹
293.15	$\frac{x_1 \times 10^2}{2}$	<u> </u>
295.15 295.15 298.15	8.14 7.94 7.66	6,114.5 6,215.8 6,367.8
303.15 308.15	7.23 6.835	6,621.0
310.15	6.69 6.47	6,975.6 7,127.5
318.15	6.14	7,380.8

Continued on next page.

COMPONENTS :	EVALUATOR:
1. Xenon; Xe; 7440-63-3	H.L. Clever Chemistry Department
2. Olive Oil	Emory University Atlanta, GA 30322 U.S.A.
	August 1978

CRITICAL EVALUATION:

Figure 1 shows the per cent deviation of all of the mole fraction solubility values from the smoothed data of Yeh and Peterson. Since olive oil is a natural product that may vary in composition and thus show variation in its solvent capacity it is not possible to classify any of the data as incorrect. Data sheets on all of the xenon in olive oil solubility reports are included.

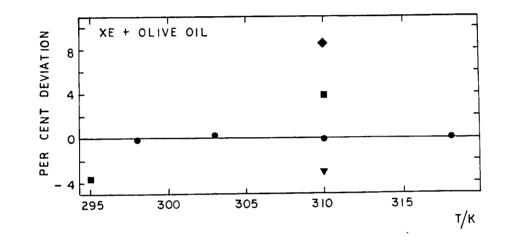


FIGURE 1. Solubility of xenon in olive oil. Per cent deviation from regression line for Yeh and Peterson's data. ▼ Ladefoged and Anderson, ● Yeh and Peterson, ■ Lawrence, et al., and ◆ Kitani.

REFERENCES

- Lawrence, J.H.; Loomis, W.F.; Tobias, C.A., Turpin, F.H. J. Physiol. 1946, <u>105</u>, 197.
- 2. Yeh, S.-Y.; Peterson, R.E. J. Pharm. Sci. 1963, 52, 453.
- 3. Ladefoged, J.; Anderson, A.M. Phys. Med. Biol. 1967, 12, 353.
- 4. Kitani, K. Scand. J. Clin. Lab. Invest. 1972, 29, 167.

COMPONENTS :	ORIGINAL MEASUREMENTS:	
 Xenon; Xe; 7440-63-3 Olive oil 	Lawrence, J. H.; Loomis, W. F.; Tobias, C. A.; Turpin, F. H.	
2. 011/0 011	<u>J</u> . <u>Physiol</u> . 1946, <u>105</u> , 197-204.	
VARIABLES:	PREPARED BY:	
T/K: 295.15 - 310.15	H. L. Clever A. L. Cramer	
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · · · ·	
T/K Mol Fraction	Bunsen Ostwald	
$\frac{x_1 \times 10^2}{2}$	Coefficient Coefficient	
295.15 7.65 310.15 6.95	1.9 1.7 2.0 1.9 ⁵	
The mole fraction solubility and Ostw the compiler.	ald coefficients were calculated by	
The molecular weight of olive oil was calculated from ρ = 0.9152 - 0.000468 calculation.	taken to be 885 and the density was $t/^{O}C$ (1) for the mole fraction	
See the evaluation sheet for the solu	bility in olive oil for more	
information.		
AUXILIARY	INFORMATION	
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS;	
Radiochemical method. No details of the method given, but authors state they used an isotope of half life 34 days. Possibly the isotope was xenon-127.	No information given.	
	ESTIMATED ERROR:	
	$\delta \alpha / \alpha = 0.05$ (Compiler)	
	REFERENCES:	
	 Battino, R.; Evans, F.D.; Danforth, W. F. J. <u>Am. Oil Chem</u>. <u>Soc</u>. 1968, <u>45</u>, 830. 	

COMPONENTS:	ODICINAL MEACUDENTINES	
1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Yeh, S.Y.; Peterson, R.E.	
	ich, bili, felerson, k.f.	
2. Olive Oil		
	T Dhawn Gai 1000 50 150 150	
	<u>J. Pharm</u> . <u>Sci</u> . 1963, <u>52</u> , 453-458.	
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 318.15	PREFARED BI:	
P/kPa: 101.325 (1 atm)	H.L. Clever	
EXPERIMENTAL VALUES: T/K Mol Fraction Bun	sen Coefficient Ostwald	
$x = 10^{2}$	Coefficient	
<u>Γ · · · · · α</u>	<u>+</u> Std. Dev. L	
	8988 + 0.0014 2.0725	
	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	
318.15 6.14 1.	4839 ± 0.0012 1.7248	
The Bunsen coefficients are the average of three measurements. The Ostwald coefficients were fitted by the method of least squares to the equation $\log L = A/T + B$ by the authors. The same line fitted olive oil and the fats. From the slope and intercept they obtained		
$\Delta H^{\circ} = (-2273 \pm 80)$ cal mol ⁻¹ and ΔS°	$P = (-6.4 \pm 0.2)$ cal K ⁻¹ mol ⁻¹	
The mole fractions were calculated by the compiler for a xenon partial pressure of 101.325 kPa (1 atm) assuming that olive oil has a molecular weight of 885.46 and a density of $\rho/g \text{ cm}^{-3} = 0.9152 - 4.68 \times 10^{-4} \text{t/oc}$ (2). See the evaluation of the xenon + olive oil system on pages 193 - 194 for the tentative thermodynamic changes of the solution process and the solubility values.		
The values of the thermodynamic changes above, which are based on the temp- erature coefficient of the Ostwald coeifficient, are for the standard state change of transfering one mole of xenon from the gas phase at a concentration of one mole dm^{-3} to the solution at a concentration of one mole dm^{-3} . The values in the evaluation are for the standard state change of transfering one mole of xenon from the gas at 101.325 kPa (1 atm) to a hypothetical unit mole fraction solution.		
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
Oil was dried and degassed by stirring under vacuum at 80°C for about 12 hr. A 50 ml. sample was placed in an absorption flask attached to a Geffken gas buret (1). The oil was constantly stirred and equili- brated with increments of gas until no change was observed in a differen- tial oil manometer for ½ hr. Differ- ence between initial and final buret readings indicated amount of gas absorbed. Absorption at successively	 Xenon. Matheson Co. Research grade, maximum impurity 0.02 mol percent N₂ and 0.05 mol per- 	
lower temperatures was determined.	ESTIMATED ERROR:	
The authors also measured the vis- cosity and surface tension of the liquid.	$\delta T/K = 0.05$ $\delta P/mmHg = 0.5$ $\delta \alpha/\alpha = 0.005$	
	DEPENDING.	
	REFERENCES: 1. Geffken, G. Z. <u>Physik</u> <u>Chem</u> . 1904, <u>49</u> , 257.	
	2. Battino, R.; Evans, F. D.; Danforth, W. F. J. Am. Oil <u>Chem</u> . <u>Soc</u> . 1968, <u>45</u> ,	
	830.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon-133; ¹³³ Xe; 14932-42-4	Ladefoged, J.; Andersen, A.M.
2. Olive Oil	Phys. Med. Biol. 1967, <u>12</u> , 353-358.
VARIABLES:	PREPARED BY:
т/к: 310.15	A.L. Cramer
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · · · ·
T/K Mol Fraction Bunsen	Ostwald Number of
$X_1 \times 10^2$ Coeffici	ent Coefficient Determinations
310.15 6.48 1.58	1.79 <u>+</u> 0.04 8
The mole fraction solubility and Bunse compiler.	en coefficient were calculated by the
The molecular weight of olive oil was calculated from $\rho = 0.9152 - 0.00046$ calculation.	taken to be 885 and the density was $8t/^{O}C$ (1) for the mole fraction
See the evaluation sheet for the solub	oility in olive oil for more
information.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The olive oil in small vials was equilibrated with a mixture of air and xenon-133 for 24 h at 310.15 K	 Xenon-133. Radiochemical Centre, Amersham, UK. Impurities less than 2 per cent.
with continuous stirring. After	2. Olive oil. Commercial Pharmacy.
equilibration, 0.1 ml samples were transferred by syringes to a 2 ml	Met standards of Pharmacopia Nordeia and Pharmacopia Danica.
rubber-capped vial and counted in a scintillation counter to a statisti-	Nordera and rharmacopia banica.
cal error below 1 per cent.	
	ESTIMATED ERROR:
	REFERENCES:
	1. Battino, R.; Evans, F.D.
	Danforth, W.F. J. Am. <u>Oil</u> <u>Chem. Soc</u> . 1968,
	<u>45, 830.</u>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon-133; $^{133}_{54}$ Xe; 14932-42-4	Kitani, K.
2. Olive Oil	Scand. J. Clin. Lab. Invest. 1972,
	<u>29, 167-172.</u>
VARIABLES:	PREPARED BY:
T/K: 310.15	P. L. Long
-,	A. L. Cramer
EXPERIMENTAL VALUES:	
T/K Mol Fraction Bunsen	Ostwald Number of
$x_1 \times 10^2$ Coeffici α	ent Coefficient Determinations L <u>+</u> Std Dev
310.15 7.25 1.658	1.883 <u>+</u> 0.036 9
The mole fraction solubility and Buns	en coefficient were calculated by
the compiler.	
The molecular weight of olive oil was was calculated from $\rho = 0.9152 - 0.0$ calculation.	taken to be 885, and the density (1) 00468t/ ^O C for the mole fraction
See the evaluation sheet on olive oil	for more information.
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Glass cuvettes were filled with the	1. Xenon-133. Radiochemical Centre,
solvent. One-third was replaced by	Amersham, UK.
the radioactive gas and air. The sealed cuvette was rotated for two	2. Olive oil. Commercial sample.
hours in a water bath at 37°C. The	
total pressure was adjusted to one atm by means of a thin needle.	
Samples from both the liquid and gas	
phase were counted by a scintillation	
detector and a Phillips pulse-height analyzer at the energy peak. Cor-	
rections for self absorption and	
scatter were made.	ESTIMATED ERROR:
	$\delta L/L = 0.02$
	REFERENCES:
	1. Battino, R.; Evans, E.D.; Danforth, W.F.
	J. Am. Oil Chem. Soc. 1968,
	45, 830.
	45, 850.
	<u>45, 650.</u>

COMPONENTS: 1. Xenon; Xe; 7440-63-3 2. Biological systems H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. September 1978

CRITICAL EVALUATION:

The solubility of xenon in biological fluids and tissues.

There are several factors that make it difficult to compare and evaluate the solubility of xenon in biological systems. First, the material from biological specimens may show a natural variation in properties which affects the solubility. Second, workers have used quite different experimental techniques to measure the solubility. Some have used classical volumetric methods with the xenon at a partial pressure near atmospheric pressure. Many have used radiochemical techniques either with natural xenon tagged with radioactive xenon at a total pressure near atmospheric or with a small unknown partial pressure of radioactive xenon. In neither of the radiochemical techniques is it necessary to know the total pressure to obtain an Ostwald coefficient. However, to compare the results of xenon solubility determinations by the volumetric method and by the radiochemical techniques one must assume the Ostwald coefficient is independent of pressure. This may not be true, especially if the gas associates with one or more components of the biological fluid. In these systems the solubility data are classed as tentative. Below are comments, which compare rather than evaluate, the solubility data in several types of biological systems.

Fat. Yeh and Peterson (1) found little difference between the solubility of xenon in olive oil and in human, rat, or dog fat. Conn (2) determined the distribution of xenon between water and dog fat. The distribution coefficient was converted to a gas-fat distribution coefficient on a weight basis, which if converted to a volume basis, assuming a density of 0.9 g $\rm cm^{-3}$ for fat, agrees with Yeh and Peterson's value.

Heme proteins. Hemoglobin and methemoglobin. Conn (2) showed that 5 to 12 weight percent solutions of human and dog hemoglobin and methemoglobin obey Henry's law at xenon partial pressures between 175 and 700 mmHg (23.33 - 93.33 kPa) at a temperature of 294.15 K. At a pressure of 700 mmHg (93.33 kPa) xenon, one mole of the protein associates with 1.9 mole of xenon, except the dog methemoglobin, which associates with 1.8 mole xenon. Schoenborn, Vogelhut and Featherstone (3) found 1.8 mole of xenon per mole of human hemoglobin at 293.15 K and a pressure of 760 mmHg (101.325 kPa). Yeh and Peterson (4) found 1.1 mole of xenon per mole of human hemoglobin at a temperature of 310.15 K and a xenon partial pressure of probably 720 mmHg (96.0 kPa). Schoenborn (5, 6) showed that Henry's law is obeyed between 0.5 and 1.5 atm (50.63 and 151.99 kPa) partial pressure xenon dissolved in a 5 per cent horse methemoglobin solution (solubility data not given) at temperatures between 273.15 and 313.15 K. Analysis of the solubility data showed about one mole of xenon bound per mole of protein at 313.15 K and nearly two moles bound at 273.15 K. The amount of xenon bound by reduced and oxyhemoglobin was the same within 5 percent as that bound by methemoglobin. X-ray diffraction analysis showed one xenon in the α sub-unit and the other in the β -sub-unit of the methemoglobin (two of each site per molecule, for a total of four sites). Wishnia (7) used a radiochemical method with xenon-133 and showed that Henry's law is not obeyed by solutions of hemoglobin in 1.8 molar (NH₄)₂SO₄ solution at 273.15 K (graph only). The curve was analyzed by a

two step association of xenon and ferrihemoglobin.

Hb + Xe = HbXe

$$HbXe + Xe = HbXe_2$$
.

He reported constants for the associations. Catchpool (8) reported on the solubility (graph) of xenon in a 0.5 per cent saline solution of human hemoglobin between 278.15 and 310.15 K at a xenon pressure of 1 atm (101.325 kPa). From his measurements he calculated 1.67 mole of xenon per mole of hemoglobin at 293.15 K and 1 atm (101.325 kPa) partial pressure

COMPONENTS: 1. Xenon; Xe; 7440-63-3 2. Biological systems EVALUATOR: H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A. September 1978

CRITICAL EVALUATION:

xenon gas. Meuhlbaecher, DeBon, and Featherstone (9) carried out experiments at 310.15 K in phosphate buffer solutions that showed that the solubility of xenon increases in the presence of bovine hemoglobin but not in the presence of either bovine gamma-globulin or bovine serum albumin.

The experiments on human, dog, bovine and horse hemoglobin are consistent with a two site association between hemoglobin and xenon which increases as the temperature decreases. The x-ray evidence indicates there are two sites for each of the two associations.

Myoglobin, metmyoglobin, cyanometuryoglobin. Schoenborn, Watson and Kendrew (10) equilibrated sperm whale metmyoglobin crystals with xenon at 2.5 atm (253.3 kPa) for 12 h. X-ray diffractions of the equilibrated crystal and normal material, analyzed by the difference Fourier method, showed that the xenon atom is bound to one specific site which is buried in the interior of the molecule. The xenon atom is nearly equidistant from the heme-linked histadine and a pyrrole ring of the heme group. Schoenborn and Nobbs (11) showed that the deoxymyoglobin crystal under similar conditions binds xenon to one specific site. Maestas and Ewing (12) showed that solutions of horse metmyoglobin do not obey Henry's law (graph) at 273.15 K and xenon partial pressures between 0.1 and 1.8 atm (10.133 - 182.385 kPa). The solubility curve was interpreted by a 1:1 association between metmyoglobin and xenon. However, Wishnia (7) interpreted his solubility measurements at 273.15 K in sperm whale myoglobin

dissolved in either phosphate buffer (?) or 2 mol dm^{-3} (NH₄)₂SO₄ by a two

step association. Ewing and Maestas (13) measured the solubility of xenon in 10 per cent horse heart myoglobin, metmyoglobin and cyanometmyoglobin between xenon partial pressures of 0.5 to 5 atm (50.63 - 506.6 kPa) at temperatures of 293.15, 298.15, and 303.15 K. The solubility (data not given) did not obey Henry's law. The solubility data were interpreted as by a single association for the xenon-cyanometmyoglobin and a two step association for the xenon-myoglobin and xenon-metmyoglobin associations. Keys and Lumry (14) report experiments that show the binding of oxygen and xenon by sperm whale myoglobin are independent up to pressures of 2 atm (202.65 kPa) xenon, but that CO and xenon binding are not independent. The evidence of one site in the crystaline material and two sites in the material in solution for xenon may be explained either by differences in configuration of the material or by a difference in accessibility of the site in the crystal and in aqueous solution.

Leghemoglobin. Leghemoglobin is a respiratory pigment found in the root nodules of most leguminous plants. Ewing and Ionescu (15) measured the solubility of xenon in 4-10 weight per cent solutions of the ferri- and ferro-leghemoglobin at 278.15, 288.15 and 298.15 K. The results (no solubility data presented) indicated a weak interaction between xenon and leghemoglobin solutions. However, the amount of xenon bound to the leghemoglobin is of the same order of magnitude as the experimental error and it was impossible to determine the stoichiometry of the interaction.

Brain Matter. Conn (2) reported water/tissue distribution coefficients for dog gray and white brain matter. Yeh and Peterson (16) reported xenon solubility in a total beef brain homogenate. Both Isbister, Schofield and Torrance (17) and Veall and Mallett (18) report xenon solubility in human gray and white matter homogenate. The solubility coefficient of xenon in human white brain matter from the two laboratories (17, 18) agrees within one per cent. The solubility of xenon in gray brain matter is approximately half the value in white matter and the agreement of the two laboratories is 20 per cent, which is outside the standard error range of the two measurements. Conn's values for dog gray and white matter, when converted to a xenon gas/tissue ratio are much higher than the values for human brain matter. Conn used the solid tissue rather than a homogenate, and he froze the tissue in liquid nitrogen before counting the absorbed radioactive xenon. The difference in the experimental techniques makes a comparison of the results of uncertain value.

COM	PONENTS:	EVALUATOR:
1.	Xenon; Xe; 7440-63-3	H. L. Clever Chemistry Department
2.	Biological systems	Emory University Atlanta, GA 30322 U.S.A.
		September 1978

CRITICAL EVALUATION:

Conn (2) found 1.1 mole xenon per mole of human albumin at 294 K Albumin. and 700 mmHg (93.33 kPa) xenon pressure. Yeh and Peterson (16) measured the solubility of xenon in three concentrations of albumin at 1 atm (101.325 kPa) and temperatures of 298.15, 303.15, and 310.15 K. These results give 0.78, 0.56 and 0.46 mole xenon per mole of albumin at 101.325 kPa and temperatures of 298.15, 303.15 and 310.15 K respectively. Ladefoged and Anderson (19) made one set of measurements at 310.15 K which appears to agree with the Yeh and Peterson value at 310.15 K.

Blood and blood components. The solubility of xenon in dog blood was studied by Conn (2). The solubility of xenon in human blood and blood components was studied by Yeh and Peterson (16), Anderson and Ladefoged (20), Ladefoged and Anderson (19), Isbister, Schofield and Torrance (17), Veall and Mallett (18) and Kitani (21). The data of Isbister et al., Veall and Mallett, and Kitani agree within a 3.5 per cent range for the distribution of xenon between the gas phase and red blood cells.

Tissues. Conn (2) studied dog tissues, Yeh and Peterson (16) studied rabbit leg muscle and Kitani and Winkler (21) studied human liver tissue of varying triglyceride content. Conn's results were for the solid tissue/water distribution, and they were converted to a tissue/gas distribution by us. Conn's 'solubility' values appear to be higher than the values determined by study of tissue homogenates.

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- 2.
- Schoenborn, B.P.; Vogelhut, P.O.; Featherstone, R.M. Pharmacologist 3. 1963, 5, 264.
- 4. Yeh, S.Y.; Peterson, R.E. J. Appl. Physiol. 1965, 20, 1041. Schoenborn, B.P. <u>Nature</u> 1965, 208, 760.
- 5.
- 6.
- 7.
- 8.
- Schoenborn, B.P. Fed. Proc. 1968, 27, 888. Wishnia, A. Biochem. 1969, 8, 5064. Catchpool, J.F. Fed. Proc. 1968, 27, 884. Meuhlbaecher, C.; DeBon, F.L.; Featherstone, R.M. Inst. Anesth. 9. <u>Clinics</u> 1963, <u>1</u>, 937.

- Clinics 1963, 1, 937. 10. Schoenborn, B.P.; Watson, J.C.; Kendrew, J.C. Nature 1965, 207, 28. 11. Schoenborn, B.P.; Nobbs, C.L. Mol. Pharmacol. 1966, 2, 491. 12. Maestas, S.; Ewing, G.J. Curr. Mod. Biol. 1967, 1, 148. 13. Ewing, G.J.; Maestas, S. J. Phys. Chem. 1970, 74, 2341. 14. Keys, M.; Lumry, R. Fed. Proc. 1968, 27, 895. 15. Ewing, G.J.; Ionescu, L.G. J. Phys. Chem. 1972, 76, 591. 16. Yeh, S.-Y.; Peterson, R.E. J. Appl. Physiol. 1965, 20, 1041. 17. Isbister, W.J.; Schofield, P.F.; Torrance, H.B. Phys. Med. Biol. 1965, 10, 243. 18. Veall, N.; Mallett, B.L. Phys. Med. Biol. 1965, 10, 375. 19. Ladefoged, J.; Anderson, A.M. Phys. Med. Biol. 1967, 12, 353. 20. Kitani, K. Scand. J. Clin. Lab. Invest. 1972, 29, 167.

- 20. Kitani, K. <u>Scand. J. Clin. Lab. Invest.</u> 1972, 29, 167. 21. Kitani, K.; Winkler, K. <u>Scand. J. Clin. Lab. Invest</u>. 1972, <u>29</u>, 173.

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS: Yeh, S.Y.; Peterson, R.E.
2. Human Fat	
	<u>J. Pharm</u> . <u>Sci</u> . 1963, <u>52</u> , 453-458.
VARIABLES: T/K: 298.15 - 318.15	PREPARED BY:
P/kPa: 101.325 (1 atm)	H.L. Clever
EXPERIMENTAL VALUES:	
Human fat 1 T/K Bunsen Ostwald	Human fat 2 T/K Bunsen Ostwald
Coefficient Coefficient	Coefficient Coefficient
α <u>+</u> Std. Dev. L	$\alpha \pm \text{Std. Dev.}$ L
298.15 1.8878 + 0.0032 2.0606	298.15 1.8476 + 0.0026 2.0166
303.15 1.7688 \mp 0.0025 1.9630	303.15 1.7645 \mp 0.0025 1.9583
310.15 1.6143 ∓ 0.0022 1.8345	310.15 1.6251 ± 0.0025 1.8503
318.15 1.4753 \pm 0.0015 1.6903	$318.15 1.4742 \pm 0.0028 1.7171$
The Bunsen coefficients are the average coefficients were fitted by the method	
$\log L = A/T + B$ by the authors. The s	
fats. From the slope and intercept th	ey obtained
$\Delta H^{O} = (-2273 \pm 80)$ cal mol ⁻¹ and Δ	$S^{\circ} = (-6.4 \pm 0.2)$ cal K^{-1} mol ⁻¹
$= (2275 \pm 00)$ car more than a	
The thermodynamic changes are for the	standard state transfer of one mole of
xenon from the gas phase at a concentr $at = a$ concetration of one mole dm^{-3} .	ation of one mole dm ⁻³ to the solution
at a concettation of one mote dm .	
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Fat was dried and degassed by stir-	1. Xenon. Matheson Co. Research
ring under vacuum at 80°C for about	grade, maximum impurity 0.02 mol
12 hr. A 50 ml. sample was placed in	percent N ₂ and 0.05 mol per cent Kr.
an absorption flask attached to a Geffken gas buret (1). The fat was	2. Human omental fats obtained from
constantly stirred and equilibrated	two deceased patients (1 and 2).
with increments of gas until no change	Extracted with petroleum ether (b.p. 309-338K). The ether was
was observed in a differential oil	evaporated at 353 K under vacuum
manometer for ½ hr. Difference be- tween initial and final buret read-	for several hours. Stored under
ings indicated amount of gas absorbed.	refrigeration until use. Fat 2
Absorption at successively lower	appeared to have more scearine
temperatures was determined. The	precipitate than fat 1 at 296 K. ESTIMATED ERROR: $\delta T/K = 0.05$
authors also measured the viscosity	$\delta P/mmHg = 0.5$
and surface tension of the liquid.	$\delta \alpha / \dot{\alpha} = 0.005$
	REFERENCES:
	AND A MARKINGER .
	1. Geffken, G. Z. Physik Chem.
	1. Geffken, G. Z. Physik Chem.
	1. Geffken, G. Z. Physik Chem.
	1. Geffken, G. Z. Physik Chem.

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COMPONENTS:			OPTCINAL N	EASUREMENTS :	
1. Xenon; Xe; 744	0-63-3			I.; Peterson	n, R.E.
2. Rat-pooled Fat					
z. Nat-pooled fat					
			J. Pharm	n. <u>Sci</u> . 1963	3, <u>52</u> , 453-458.
VARIABLES:		-	PREPARED H	ВҮ:	
T/K: 298 P/kPa: 101	.15 - 318.19 .325 (1 atm)	5		H.L. Clev	ver
EXPERIMENTAL VALUES:					·····
	T/K Bui	nsen Coef	fficient		
	α	+ Std. I	Dev.	Coefficien L	t
	298 15 1	8376 + (0.065	2.0057	_
	298.15 1 303.15 1			1.9086	
		.5712 + (1.7856 1.6627	
					_
The Bunsen coeffic coefficients were log L = A/T + B by fats. From the sl	fitted by the the suthors	he method s. The s	l of leas [.] same line	t squares to fitted olig	o the equation
$\Delta H^{O} = (-2273 + $	80) cal mo	1 ⁻¹ and <i>l</i>	∆s ^o = (-6	.4 <u>+</u> 0.2) c	al K^{-1} mol ⁻¹
The thermodynamic	changes are	for the	standard	state tran	sfer of one mole of
xenon from the gas at a concentration	phase at a	concenti	ration of	one mole d	m^{-3} to the solution
at a concentration	or one more	e am ~.			
			INFORMATIO	N	
METHOD / APPARATUS/PR				N D PURITY OF MA	ATERIALS :
METHOD/APPARATUS/PR Fat was dried a	OCEDURE:	AUXILIARY	SOURCE ANI	D PURITY OF MA	on Co. Research
METHOD/APPARATUS/PR Fat was dried a stirring under vac	COCEDURE: and degassed suum at 80°C	AUXILIARY by for	SOURCE AND	D PURITY OF MA on. Mathes de, maximum	on Co. Research impurity 0.02
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor	COCEDURE: ind degassed :uum at 80°C) ml. sample :ption flask	AUXILIARY by for was	SOURCE ANI 1. Xen gra mol per	D PURITY OF MA on. Mathes de, maximum percent N ₂ cent Kr.	on Co. Research impurity 0.02 and 0.05 mol
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff	OCEDURE: ind degassed suum at 80°C oml. sample ption flask ken gas bur	AUXILIARY by for was et (1).	SOURCE AND 1. Xen gra mol per 2. Rat	D PURITY OF M on. Mathes de, maximum percent N ₂ cent Kr. retroperit	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric,
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with	COCEDURE: and degassed uum at 80°C ption flask Eken gas bur intly stirre increments	AUXILIARY by for was et (1). d and of gas	SOURCE ANI 1. Xen gra mol per 2. Rat ome was	D PURITY OF MA on. Mathes de, maximum percent N ₂ cent Kr. retroperit ntal, and h cut into a	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa	COCEDURE: and degassed cuum at 80°C) ml. sample cption flask Ken gas bur antly stirre increments as observed	AUXILIARY by for was et (1). d and of gas in a	SOURCE ANI J. Xen gra mol per 2. Rat ome was squ	D PURITY OF MA on. Mathes de, maximum percent N ₂ cent Kr. retroperit ntal, and h cut into a ares, dried	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between	OCEDURE: and degassed cuum at 80°C ml. sample ption flask ken gas bur intly stirre increments as observed anometer fo i initial an	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final	SOURCE ANI 1. Xen gra mol per 2. Rat ome was squ vac the	D PURITY OF M on. Mathes de, maximum percent N cent Kr. 2 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind	COCEDURE: and degassed cuum at 80°C o ml. sample ption flask then gas bur antly stirre increments as observed anometer fo a initial an licated amou	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of	SOURCE ANI 1. Xen. gra mol per 2. Rat ome was squ vac the eth	D PURITY OF M on. Mathes de, maximum percent N cent Kr. 2 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a
METHOD /APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe	OCEDURE: and degassed suum at 80°C o ml. sample ption flask ken gas bur antly stirre increments as observed anometer fo n initial an licated amou sorption at aratures was	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter-	SOURCE ANI 1. Xen gra mol per 2. Rat ome was squ vac the eth Sox was	D PURITY OF MA on. Mathes de, maximum percent N2 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extracted	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome was squ vac the eth Sox was vac	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extrac evaporated uum for sev gerated unt	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use.
METHOD /APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome was squ vac the eth Sox was vac fri	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extrac evaporated uum for sev gerated unt ED ERROR:	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use. $\delta T/K = 0.05$
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author the viscosity and	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI gra mol per 2. Rat was squ vac the eth Sox was vac fri ESTIMAT	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. 2 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extrac evaporated uum for sev gerated unt ED ERROR: *	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use.
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author the viscosity and	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome was squ vac the eth Sox was vac fri	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. 2 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extrac evaporated uum for sev gerated unt ED ERROR: *	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use. $\delta T/K = 0.05$ mmHg = 0.5
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author the viscosity and	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome: was squ vac the eth Sox was vac fri ESTIMAT REFERENCE 1. Gef	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. 1 retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extract evaporated uum for sev gerated unt ED ERROR:	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use. $\delta T/K = 0.05$ mmHg = 0.5 $\delta \alpha / \alpha = 0.005$. Physik Chem.
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author the viscosity and	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome: was squ vac the eth Sox was vac fri ESTIMAT REFERENCE 1. Gef	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extract evaporated uum for sev gerated unt ED ERROR: `	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use. $\delta T/K = 0.05$ mmHg = 0.5 $\delta \alpha / \alpha = 0.005$. Physik Chem.
METHOD/APPARATUS/PR Fat was dried a stirring under vac about 12 hr. A 50 placed in an absor attached to a Geff The fat was consta equilibrated with until no change wa differential oil m Difference between buret readings ind gas absorbed. Abs sively lower tempe mined. The author the viscosity and	ACCEDURE: and degassed uum at 80°C o ml. sample option flask ken gas bur increments is observed anometer fo initial an licated amou sorption at eratures was is also meas	AUXILIARY by for was et (1). d and of gas in a r ½ hr. d final nt of succes- deter- ured	SOURCE ANI 1. Xen gra mol per 2. Rat ome: was squ vac the eth Sox was vac fri ESTIMAT REFERENCE 1. Gef	D PURITY OF MA on. Mathes de, maximum percent N2 cent Kr. retroperit ntal, and h cut into a ares, dried uum, coarse n extracted er (b.p. 30 hlet extract evaporated uum for sev gerated unt ED ERROR: `	on Co. Research impurity 0.02 and 0.05 mol oneal, mesenteric, air clipped skin bout 2.5 cm at 353 K under ly crushed, and with petroleum 8-338 K) in a tor. The ether at 353 K under eral hours. Re- il use. $\delta T/K = 0.05$ mmHg = 0.5 $\delta \alpha / \alpha = 0.005$. Physik Chem.

ORIGINAL MEASUREMENTS: COMPONENTS: Xenon; Xe; 7440-63-3 1. Yeh, S.Y.: Peterson, R.E. 2. Dog Fat J. Pharm. Sci. 1963, 52, 453-458. VARIABLES: PREPARED BY: T/K: 298.15 - 318.15 P/kPa: 101.325 (1 atm) 298.15 - 318.15 H.L. Clever EXPERIMENTAL VALUES: T/K Bunsen Coefficient Ostwald Coefficient α + Std. Dev. T. $\begin{array}{r} 1.8393 \ \pm \ 0.0025 \\ 1.7557 \ \pm \ 0.0020 \end{array}$ 298.15 2.0084 303.15 1.9493 $\begin{array}{r} 1.6113 \mp 0.0021 \\ 1.4589 \mp 0.0015 \end{array}$ 1.8299 310.15 318.15 1.6962 The Bunsen coefficients are the average of three measurements. The Ostwald coefficients were fitted by the method of least squares to the equation log L = A/T + B by the authors. The same line fitted olive oil and the fats. From the slope and intercept they obtained $\Delta H^{\circ} = (-2273 \pm 80) \text{ cal mol}^{-1} \text{ and } \Delta S^{\circ} = (-6.4 \pm 0.2) \text{ cal K}^{-1} \text{ mol}^{-1}$ The thermodynamic changes are for the transfer of one mole of xenon from the gas phase at a concentration of one mole dm^{-3} to the solution at a concentration of one mole dm^{-3} . AUXILIARY INFORMATION METHOE / APPARATUS / PROCEDURE : SOURCE AND PURITY OF MATERIALS: Fat was dried and degassed by stir-1. Xenon. Matheson Co. Research ring under vacuum at 80°C for about grade. Maximum impurity 0.02 12 hr. A 50 ml. sample was placed in mol percent N2 and 0.05 mol an absorption flask attached to a percent Kr. Geffken gas buret (1). The fat was constantly stirred and equilibrated 2. Dog perineal, mesenteric, omenwith increments of gas until no change tal, and other adipose fats were was observed in a differential oil extracted with petroleum ether manometer for ½ hr. Difference be-(b.p. 309-338 K). The ether was tween initial and final buret readevaporated at 353 K under vacuum ings indicated amount of gas absorbed. for several hours. Stored under refrigeration until use. Absorption at successively lower temperatures was determined. The ESTIMATED ERROR: authors also measured the viscosity $\delta T/K = 0.05$ and surface tension of the liquid. $\delta P/mmHg = 0.5$ $\delta \alpha / \alpha = 0.005$ **REFERENCES:** Geffken, G. Z. Physik Chem. 1904, <u>49</u>, 257. 1.

COMPONENTS:	••••••••••••••••••••••••••••••••••••••	
1. Xenon-133; 133	Xe; 14932-42-4	ORIGINAL MEASUREMENTS: Ladefoged, J.; Anderson, A.M.
2. Paraffin Oil		Phys. Med. Biol. 1967, 12, 353-358.
VARIABLES:		PREPARED BY:
т/к: 310.	16	A. L. Cramer
1/K: 510.	15	A. D. Clance
EXPERIMENTAL VALUES:		
EXFERIMENTAL VALUES;		Number of
	T/K Ostwald Coefficien L <u>+</u> Std De	
	310.15 1.96 + 0.0	7 8
	AUXILIARY	INFORMATION
METHOD/APPARATUS/PR	OCEDURE:	SOURCE AND PURITY OF MATERIALS:
The technique desc	ribed by Anderson	1. Xenon-133. Radiochemical Centre,
and Ladefoged (1) materials were pla	was used. The	Amersham, U.K. Two per cent
tubes together wit	h a sample of water	impurity of ¹³¹ Xe and ⁸⁵ Kr.
in an air tight ch contained air and	amber. The chamber	2. Paraffin Oil. Pharmacy. Met
xenon-133. The sa	mples were stirred	requirements of Pharmacopoea Nordica and Pharmacopoea Danica.
continuously at 31 hours. After equi	0.15 K for 24	
samples were trans	ferred into	
syringes and sampl were counted in a	es of about 0.1 ml scintillation	
counter. The Ostw	ald coefficients	ESTIMATED ERROR:
were calculated in ratio of counts in		
sample and the mea	sured Ostwald coef-	See standard deviations above.
ficient in water. data sheet on Xe +		
	2 []0 -07.	REFERENCES:
		 Anderson, A.M.; Ladefoged, J. J. Pharm. <u>Sci</u>. 1965, <u>54</u>, 1684.
		<u>5. 11011. 501</u> , 1903, <u>5.</u> , 10011

COMPONENTS:	3			ORIGINAL MEA	
1. Xenon; 13	³ Xe; 14932	-42-4		Kitani, K	•
2. Paraffin	0i1				
3. Lecithin					
J. Deeremin				<u>Scand</u> . J. 1972, 29,	Clin. Lab. Invest. 167-172.
VARIABLES:	310.15			PREPARED BY:	P.L. Long
	101.325	(1 atm)			A.L. Cramer
EXPERIMENTAL VAL	UES:				
	т/к	Bunsen		Ostwald	Replications
2	Co	efficient α		efficient Std. Dev.	
	Paraffi	n Oil			
	310.15	1.819	2.06	5 <u>+</u> 0.043	16
		-	2.07	9*	-
	Lecithi	n			
	310.15	-	1.47	7*	
*Extrapolated	values.	See equation	on be	elow.	
The Ostwald c	oefficient	was indepe	ender	nt of press	ure.
ity of the ga of solubility The equation The equation	of the ga for the st below was	res of para s is linea: raight line estimated :	affir r in e in from	n oil and l lecithin p the paper the graph	rapolated from the solubil- ecithin. The coefficient er cent (graph in paper). appears to be in error. by the compiler. w/v per cent)
		AUXII	LIARY	INFORMATION	
METHOD / APPARAT		IDF .		SOURCE AND E	PURITY OF MATERIALS:
A glass cu liquid. One-	vette is f third of t	illed with the liquid	is	1. Xenon	. Radiochemical Centre, ham, England.
replaced with The sealed cu	wette is p	laced in a		2. Paraf	fin oil. Commercial quality.
thermostated pressure is a means of a th The radioa for self abso made by a sci a Philips pul	djusted to in needle. active assa orption and ntillatior) l atm by by, corrected l scatter, d detector	ed is		ecithin. Purified twice ether and acetone.
				ESTIMATED EN	RROR:
				See s	tandard deviation above.
				REFERENCES :	

COMPONENTS: ORIGINAL MEASUREMENTS: Conn, H. L. 1. Xenon; Xe; 7440-63-3 Xenon-133; ¹³³Xe; 14932-42-4 J. Appl. Physiol. 1961, 16, 1065-1070. Xenon-135; ¹³⁵Xe; 14995-63-1 Dog Blood and Components 2. VARIABLES: PREPARED BY: T/K: 294.15 A. L. Cramer Xe P/kPa: 1.867 - 21.332 H. L. Clever (14-160 mmHg) EXPERIMENTAL VALUES: Xe (counts m⁻¹) g⁻¹ Tissue Solubility* T/K Xe (counts m^{-1}) g^{-1} Water Coefficient S Water 0.118** 294.15 1.00 Plasma 294.15 1.45 ± 0.05 0.171 Whole Blood (mean hemoglobin concentration $15 q 100 q^{-1} blood)$ 2.49 + 0.04 0.294 294.15 Erythrocytes (mean hemoglobin conc. 35 g 100 g⁻¹ red blood cells) 3.75 + 0.06294.15 0.443 Hemoglobin solution (mean hemoglobin conc. $35 \text{ g} 100 \text{ g}^{-1}$ solution) 294.15 2.83 + 0.050.334 *Calculated by the compiler. cm^3 xenon at 1 atm and 294.15 K g⁻¹ tissue. **cm³ Xe 1 atm and 294 K/g water. Calculated from data in critical evaluation of xenon in water. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Xenon. Air Reduction Sales. A one ml aliquot of each solution 1. Specially purified. The gas was was placed in a 100 ml glass tonosubjected to neutron bombardment meter and equilibrated with the gas mixture for 2 hours at 294 K. Three-tenths ml of each sample was within a nuclear reactor. Resultant xenon isotopes were mainly drawn anaerobically into a 1-ml ¹³³Xe and ¹³⁵Xe. syringe and the radioactivity was determined in a scintillation counter. 2. Dog Blood and Components. Water under the same partial pressure xenon was counted for the tissue/ water ratio. Some of the hemoglobin methemoglobin ESTIMATED ERROR: and albumin systems were determined See standard error of mean for 36 by this method. experiments above. **REFERENCES:**

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Xenon; Xe; 7440-63-3 Xenon-133; ¹³³Xe; 14932-42-4</pre>	Conn, H. L.
	J. Appl. Physiol. 1961, 16,
Xenon-135; ¹³⁵ Xe; 14993-63-1	1065-1070.
 Albumin, Hemoglobin and Methemoglobin 	
VARIABLES:	PREPARED BY:
T/K: 294.15 Xe P/kPa: 23.33 - 93.325 (175 - 700 mmHg)	A. L. Cramer H. L. Clever
EXPERIMENTAL VALUES:	
T/K $\frac{\text{cm}^3 \text{ Xe g}^{-1} \text{ Protein}}{\text{cm}^3 \text{ Xe g}^{-1} \text{ Water}}$	n <u>mol Xe*</u> Solubility mol Protein Coefficient S
Human Albumin	
294.15 3.50 + 0.3	1.1 0.413
Human Hemoglobin	
294.15 6.43 + 0.4	1.9 0.759
Human Methemoglobin	
294.15 6.45 <u>+</u> 0.4	1.9 0.761
Dog Hemoglobin	
294.15 6.24 <u>+</u> 0.1	1.9 0.736
Dog Methemoglobin	
294.15 6.04 ± 0.4	1.8 0.713
*calculated from experimen pressure of 700 mmHg.	nts done at a xenon partial
The solubility coefficient, S, was calc the protein/water ratio by 0.118, which xenon g^{-1} water at 294.15 K (See the cr xenon in water.)	is the solubility coefficient of
The hemoglobin and methemoglobin soluti	ions were 5 to 12 weight percent.
The xenon gas uptake by human and dog h Henry's law.	nemoglobin and methemoglobin obeys
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Blood was drawn and centrifuged. The red blood cells were washed repeatedly with saline to remove serum fats. Hemoglobin was obtained by hemolysing the red blood cells with distilled water, and precipitating stroma by centrifugation. The mid-portion of the supernatant fluid was withdrawn	 Xenon. Air Reduction Sales. Specially purified. The gas was subjected to neutron bombardment in a nuclear reactor. Resultant xenon isotopes were mainly ¹³³Xe and ¹³⁵Xe. Albumin. Pentex Corp. Crystaline. albumin, 2-4% g. Hemoglobin, methemoglobin. See procedure.
Methemoglobin was obtained by oxi- dızıng hemoglobin with excess potas- sium ferricyanide or sodium nitrite.	ESTIMATED ERROR:
One ml samples were drawn into a 5 ml syringe and filled with gas with a xenon partial pressure of 175 to 700 mmHg. The syringes were shaken 1-2 hours at 294 K. The gas phase was	See standard error of mean above.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63	3-3		Schoenborn, B.P.; Vogelhut, P.O.; Featherstone, R.M.
2. Water; H ₂ O; 7732-1	.8-5		Pharmacologist 1963, <u>5</u> , 264.
3. Haemoglobin (humar	1)		
VARIABLES: T/K: 293.15			PREPARED BY:
	5 (1 atm)		H. L. Clever
EXPERIMENTAL VALUES:			
	T/K	Mol Xe p	er mol haemoglobin
	293.15		1.8
		·······	
		AUXILIARY	INFORMATION
METHOD / APPARATUS/PROCE			SOURCE AND PURITY OF MATERIALS:
Standard PVT measuremental details in eith	ner this	abstract	No information given on any of the components.
of a meeting paper or cation (1).	a later	publi-	
			ESTIMATED ERROR:
			Qualitative.
			REFERENCES: 1. Schoenborn, B.P.; Featherstone, R.M.;
			Vogelhut, P.O.; Süsskind, C.
			<u>Nature</u> 1964, <u>202</u> , 695.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Meuhlbaecher, C.; DeBon, F.L.; Featherstone, R.M.
2. Water; H ₂ O; 7732-18-5	reacherscone, N.M.
3. Sodium Phosphate Buffer	
4. Bovine Blood Components	
	Inst. Anesth. Clinics 1963, 1,
VARIABLES :	937-952.
VARIABLES:	PREPARED BY:
T/K: 310.15	H.L. Clever
EXPERIMENTAL VALUES: The Bunsen coefficients were presented Bunsen coefficient in sodium phosphate about the individual systems follow:	on large scale graphs. The xenon buffer was about 0.083. Comments
T/K Comments	
Bovine Gamma-Globulin + Phosph Strength 0.16)	ate Buffer (pH 6.3-6.5, Ionic
310.15 No apparent change in the bovine gamma-globulin was	xenon Bunsen coefficient as increased from 0-8 per cent.
Bovine Serum Albumin + Phospha Strength 0.16)	te Buffer (pH 5.6-6.3, Ionic
bovine serum albumin was At 20 per cent bovine ser	xenon Bunsen coefficient as the increased from 0 to 10 per cent. um albumin the Xenon Bunsen crease a little more than the the measurement.
Bovine Hemoglobin + Phosphate Strength 0.16)	Buffer (pH 6.3-6.6, Ionic
310.15 A linear increase in the bovine hemoglobin was inc	xenon Bunsen coefficient as the reased from 0 to 20 per cent. absorbed 58 per cent more xenon ion.
	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Gas chromatography	No information
	ESTIMATED ERROR:
	$\delta \alpha / \alpha = 0.08$
	REFERENCES:

COMPONENTS: 1. Xenon; Xe; 7440-63-3	ORIGINAL MEASUREMENTS:
I. ACHON, AC, /440-03-3	Yeh, S-Y.; Peterson, R.E.
2. Water; H ₂ O; 7732-18-5	
3. Human Whole Blood and Blood	
Components	J. Appl. Physiol. 1965, 20, 1041-1047.
VARIABLES:	PREPARED BY:
т/к: 310.15	A.L. Cramer
Total P/kPa: 101.325 (1 atm)	
	<u> </u>
EXPERIMENTAL VALUES:	
T/K Absorption Coefficient I	Number of Absorption Determinations Coefficient
mean β + Std. Dev.	g ⁻¹ Hemoglobin
	g Hemoglobin
	hemoglobin, 92.35% water,
1.57 mg cm ⁻³ lipid)	
310.15 0.1046 <u>+</u> 0.0057	3 0.3918
Hemoglobin solution (15.3)	hemoglobin, 84.60% water,
2.60 mg cm ⁻³ lipid)	
310.15 0.1241 + 0.0032	4 0.3469
Whole Blood (425 ml. whole	
sodium citrate solution)	, 1000 , 120 mil 1.020
310.15 0.1412 + 0.0044	3 –
*The authors give a weighted average of	
AUXILIARY	INFORMATION
METHOD/AFPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS; 1. Xenon. The Matheson Co. Research
In Yeh and Peterson (1) modification of Geffcken (2) apparatus, 45 ml. of	grade, maximum impurity 0.02%
liquid was frozen, evacuated, and	nitrogen and 0.05% krypton.
melted repeatedly until no bubbles	2. Water. Distilled. 3. Human Blood. 425 ml. from a
appeared in liquid under vacuum. Equilibration with gas and measure-	normal donor, mixed with 120 ml.
ment of solubility followed (1).	1.32% sodium citrate solution. Frozen and thawed to hemolyze
	red blood cells.
	4. Hemoblobin. From centrifuged
	citrated human blood.
	ESTIMATED ERROR:
	$\delta T/K = 0.05$
	$\delta P/mmHg = 0.2$ $\delta L/L = 0.0015$
	REFERENCES :
	1. Yeh, S-Y.; Peterson, R.E.
	J. <u>Pharm</u> . <u>Sci</u> . 1963, <u>52</u> , 453.
	 J. Pharm. Sci. 1963, 52, 453. Geffcken, G. Z. Physik. Chem. 1904, 49, 257.
	<u>J. Pharm. Sci</u> . 1963, <u>52</u> , 453. 2. Geffcken, G.

COMPONENTS : ORIGINAL MEASUREMENTS: Xenon-133; ¹³³₅₄Xe; 14932-42-4 1. Anderson, A.M.: Ladefoged, J. 2. Human Blood J. Pharm. Sci. 1965, 54, 1684-1685. VARIABLES: PREPARED BY т/К: 310.15 A.L. Cramer H.L. Clever Hematocrit/%: 0 - 88 EXPERIMENTAL VALUES: A total of 64 determinations of the partition coefficient of xenon-133 between blood and water were carried out. Separate samples of water and of blood were equilibrated with the same air-radon-133 mixture in each experiment. The blood hematocrit varied from 0 to 88 weight per cent. The data was given in a graph and fitted by a linear regression to Partition Coefficient = $(1.02 \pm 0.02) + (0.0112 \pm 0.0004)$ (wt % hematocrit with an overall standard deviation of 0.08. The plasma/water partition coefficient is 1.02, and the erythorocyte/water partition coefficient is 2.14. A formula for the partition coefficient of tissue/blood as a function of hematocrit % was given. A plasma/gas and erythorocyte/gas partition coefficient may be obtained from the equation value by mutiplying by 0.0834, the Ostwald solubility of xenon in water reported by the authors (see page 139). The erythorocyte/xenon gas Ostwald coefficient of 0.178 calculated from the information above is 12 - 15 per cent lower than values reported on pages 213 and 214, and 6 per cent lower than the authors value in a later report (see page 215). See also the data on page 218. AUXILIARY INFORMATION SOURCE AND PURITY OF MATERIALS: METHOD / APPARATUS / PROCEDURE: Xenon-133. The Radiochemical The samples in small vials were 1. equilibrated with a mixture of air Centre, Amersham, England. and xenon-133 for 24 h at 310 K. The Impurities (<2 per cent) were samples were stirred continuously. mainly xenon-133m with trace After equilibration 0.1 ml samples amounts of xenon-131 and krypton-85. were transferred anaerobically by syringes to a 2 ml. rubber-capped vial and counted in a scintillation Blood. From voluntary donors. 2. counter to a statistical error below 1 per cent. The hematocrit was varied by removal of plasma or erythrocytes from whole ESTIMATED ERROR: blood after centrifuging. **REFERENCES:**

COMPONENTS :		OPTOTNAL WEACUPENERUPO
1. Xenon-133; $\frac{133}{54}$	Ke: 14932-42-4	ORIGINAL MEASUREMENTS: Isbister, W. H.; Schofield, P. F.;
51		Torrance, H. B.
2. Saline and Bloc	od Components	<u>Phys. Med. Biol</u> . 1965, <u>10</u> , 243-250.
VARIABLES:		PREPARED BY:
		A. L. Cramer
т/к: 310.1	15	H. L. Clever
EXPERIMENTAL VALUES:	······································	t
	T/K Ostwald	
	$\begin{array}{c} \text{Coefficie} \\ \text{L} \pm \text{Std} \\ \end{array}$	
	Saline (water)	*
	310.15 0.0926 <u>+</u> 0.	. 0027 7
	Plasma	
	310.15 0.1028 <u>+</u> 0.	
	Red Cells (Her	
	$310.15 0.2020 \pm 0$	
	*The saline solution It may be the star	on was not described.
	percent solution of	
		INFORMATION
METHOD /APPARATUS/PR	OCEDURE:	SOURCE AND PURITY OF MATERIALS:
Two ml samples of	OCEDURE: blood were intro-	· · · · · · · · · · · · · · · · · · ·
Two ml samples of duced into the sam of a concentrated	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix-	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human
Two ml samples of duced into the sam of a concentrated ture were added to	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	 SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene.
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	 SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene.
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene. ESTIMATED ERROR:</pre>
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene. ESTIMATED ERROR: See standard error of mean above.</pre>
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene. ESTIMATED ERROR: See standard error of mean above.</pre>
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene. ESTIMATED ERROR: See standard error of mean above.</pre>
Two ml samples of duced into the sam of a concentrated ture were added to was then sealed. shaken and equilib two hours. After tubes were centrif 30 minutes at 3000 phases cells, plas separately counted constructed lead c	OCEDURE: blood were intro- ple tube, four ml xenon-133 air mix- the tube which The tubes were rated at 310 K for equilibration the uged at 310 K for rpm. The three ma and gas were in a specially ollimator attached	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. No information given. 2. Blood components. Fresh human blood containing a suitable amount of Sequestrene. ESTIMATED ERROR: See standard error of mean above.</pre>

COMPONENTS: 1. Xenon-133; ¹³³ ₅₄ Xe; 14932-42-4		ORIGINAL MEASUREMENTS: Veall, N.; Mallett, B. L.	
54			
2. Blood components		Phys. Med. Biol. 1965, 10, 375-380.	
VARIABLES:	<u> </u>	PREPARED BY:	
т/к: 310.15		A. L. Cramer	
		H. L. Clever	
EXPERIMENTAL VALUES:		l	
EATERINEWIAL VALUES:			
	T/K Solubilit	ry Number of ent Determinations	
	$S \pm Std E$		
	Wator		
	Water	.0005 9	
	$310.15 0.0903 \pm 0.0003$,0005 2	
	Plasma		
	$310.15 0.1025 \pm 0$.0009 12	
	Red Cells		
	$310.15 0.2100 \pm 0.00$.0043 12	
· · · · · · · · · · · · · · · · · · ·			
	AUXILIARY	INFORMATION	
METHOD / APPARATUS / PI	ROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
Red cell measureme		1. Xenon-133. No information given.	
blood samples of	varying haematocrit.		
Plasma measurements were made on samples first haemolyzed by rapid		2. Blood. Freshly drawn heparinized blood from normal people.	
freezing and thaw		Stood from Horman Poop-of	
•	l samples were add		
to sample tube; al	bout 0.1 ml of air		
containing about	10 µC of xenon-133		
was added and the Sample tubes were	tupe sealed.		
by leaving over n	equilibrated either		
zontally at 310 K	equilibrated either ight lying hori-		
2-3 minutes for so samples were brief	equilibrated either ight lying hori- or inverted every	ESTIMATED ERROR:	
samples were briefly centrifuged to remove air bubbles from liquid and		ESTIMATED ERROR: See standard error of mean above.	
remove air bubble:	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above.	
remove air bubbles then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to		
remove air bubble then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K \approx 0.5$ (Compiler)	
remove air bubble then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above.	
remove air bubble: then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K \approx 0.5$ (Compiler)	
remove air bubble: then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K \approx 0.5$ (Compiler)	
remove air bubble: then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K \approx 0.5$ (Compiler)	
remove air bubble: then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K \approx 0.5$ (Compiler)	
remove air bubbles then gas and liqu	equilibrated either ight lying hori- or inverted every everal hours. The fly centrifuged to s from liquid and	See standard error of mean above. $\delta T/K = 0.5$ (Compiler)	

COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Xenon-133; ${}^{133}_{54}$ Xe; 14932-42-4	Ladefoged, J.; Anderson, A.M.		
2. Plasma and Erythrocytes	Phys. Med. Biol. 1967, <u>12</u> , 353-358.		
VARIABLES:			
	PREPARED BY: A. L. Cramer		
T/K: 310.15	H. L. Clever		
EXPERIMENTAL VALUES:			
T/K Pre-saturating gas	Ostwald Number of Coefficient Determinations L + Std. Dev.		
Water			
310.15	0.0834 <u>+</u> 0.0002 107		
Plasma*			
	0.091 ± 0.002 30		
	0.090 + 0.002 36 0.093 + 0.002 27		
Erythrocytes*	-		
310.15 Air	0.19 ± 0.008 30		
Nitrogen Oxygen	$\begin{array}{cccccccccccccccccccccccccccccccccccc$		
coefficient of 0.089 <u>+</u> in erythrocytes.	iments in which the xenon partial n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004		
coefficient of 0.089 +	n 0.1 to 1 atm gave an Ostwald		
coefficient of 0.089 <u>+</u> in erythrocytes.	n 0.1 to 1 atm gave an Ostwald		
coefficient of 0.089 <u>+</u> in erythrocytes. AUXILLA METHOD/APPARATUS/PROCEDURE:	n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004 RY INFORMATION		
Coefficient of 0.089 <u>+</u> in erythrocytes. AUXILLA METHOD/APPARATUS/PROCEDURE: Blood from volunteer donors was heparinized and centrifuged 30 min- utes at 1500 G. Samples were place in small test tubes together with a sample of water in an air tight box containing 0.5 to 2 µCi xenon-133 in 100 ml of either air, nitrogen	n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004 RY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Cer Amersham, U.K. Two per cent impurity of ¹³¹ Xe and ⁸⁵ Kr. Yenon Dansk 11t og Briut.	ntre	
Coefficient of 0.089 <u>+</u> in erythrocytes. AUXILLA METHOD/APPARATUS/PROCEDURE: Blood from volunteer donors was heparinized and centrifuged 30 min- utes at 1500 G. Samples were place in small test tubes together with a sample of water in an air tight box containing 0.5 to 2 µCi xenon-133 in 100 ml of either air, nitrogen or oxygen. The system was stirred continuously at 310 K for 24 hours. After equilibration the samples wer transferred into syringes, about 0. ml samples were counted in a scinti	n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004 RY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Cer Amersham, U.K. Two per cent impurity of ¹³¹ xe and ⁸⁵ Kr. Xenon. Dansk Ilt og Briut. 99.95 mol per cent. 2. Blood components. Volunteer donors.	ntre	
Coefficient of 0.089 <u>+</u> in erythrocytes. AUXILL METHOD/APPARATUS/PROCEDURE: Blood from volunteer donors was heparinized and centrifuged 30 min- utes at 1500 G. Samples were place in small test tubes together with a sample of water in an air tight box containing 0.5 to 2 μCi xenon-133 in 100 ml of either air, nitrogen or oxygen. The system was stirred continuously at 310 K for 24 hours. After equilibration the samples wer transferred into syringes, about 0. ml samples were counted in a scinti lation counter and compared with water value. Authors calculated th Ostwald solubility coefficient in blood of 30, 40 and 50 percent	n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004 RY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Cer Amersham, U.K. Two per cent impurity of ¹³¹ Xe and ⁸⁵ Kr. Xenon. Dansk Ilt og Briut. 99.95 mol per cent. 2. Blood components. Volunteer donors. e ESTIMATED ERROR: e See standard deviations above.	ntre	
Coefficient of 0.089 <u>+</u> in erythrocytes. AUXILLA METHOD/APPARATUS/PROCEDURE: Blood from volunteer donors was heparinized and centrifuged 30 min- utes at 1500 G. Samples were place in small test tubes together with a sample of water in an air tight box containing 0.5 to 2 µCi xenon-133 in 100 ml of either air, nitrogen or oxygen. The system was stirred continuously at 310 K for 24 hours. After equilibration the samples wer transferred into syringes, about 0. ml samples were counted in a scinti lation counter and compared with water value. Authors calculated th Ostwald solubility coefficient in	n 0.1 to 1 atm gave an Ostwald 0.002 in Plasma and 0.189 <u>+</u> 0.004 RY INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Cer Amersham, U.K. Two per cent impurity of ¹³¹ Xe and ⁸⁵ Kr. Xenon. Dansk Ilt og Briut. 99.95 mol per cent. 2. Blood components. Volunteer donors. e ESTIMATED ERROR: e See standard deviations above.		

COMPONENTS:	IPONENTS:		ORIGINAL N	ORIGINAL MEASUREMENTS:		
L. Xenon; Xe; 7440-63-3		Yeh, S.	Yeh, SY,; Peterson, R. E.			
2. Water;	н ₂ 0; 7732	-18-5	J. Appl. Physiol. 1965, 20, 1041-		1041-104	
3. Sodium	Chloride;	NaCl; 7647-14	-5			
4. Human	Albumin; 9	048-46-8				
VARIABLES:	·····		PREPARED I	3Y:		
T /1	K: 298.15	- 310.15		A. L. Cramer		
P/kP	a: 101.32	5 (1 atm)		H. L. Clever		
Albumin,	/wt %: 5.1	2 - 27.93				
EXPERIMENTAL	VALUES:		<u></u>			
T/K		Mol Fraction		Ostwald Coefficient	Number	
	wt %	$X_1 \times 10^2$			Determ-	
			α	L ± Std Dev	ination	
298.15	5.12		0.0939	0.1025 ± 0.0028	4	
303.15			0.0845	0.0938 ± 0.0025	3	
310.15			0.0709	0.0805 ± 0.0008	2	
298.15	15.34		0.1092	0.1192 ± 0.0028	3	
303.15			0.0963		3 3	
310.15			0.0786	0.0892 ± 0.0020	3	
298.15	27.93		0.1239	0.1352 ± 0.0070	4	
303.15			0.1100	0.1221 ± 0.0046	4	
310.15			0.0880	0.0999 ± 0.0087	4	
298.15	100	42.26	0.2181	0.2382		
		35.77	0.1761	0.1954		
303.15		31.51	0.1315	0.1493		

The Ostwald coefficients in 100 % human albumin were values extraploated from the values at lower concentration by the authors. The Bunsen coefficients and mole fraction solubilities were calculated by the compiler. The authors used an albumin molecular weight of 69,000 and a density of 1.0 to calculate mole ratios of xenon to albumin of 0.732, 0.557, and 0.460 at the temperatures 298.15, 303.15, and 310.15 K respectively.

AUXILIARY INFORMATION

METHOD	SOURCE AND PURITY OF MATERIALS;
A 45 cm ³ sample of albumin solution was frozen, evacuated, and melted repeatedly until no bubbles appeared in the liquid under vacuum in the Yeh and Peterson modification (1) of the Geffcken apparatus (2). Equilibration with gas and measurement of the solubility followed.	 Xenon. The Matheson Co. Research grade, maximum impurity 0.02 % nitrogen and 0.05 % krypton. Human serum albumin. Cutter Laboratories. A 25 % solution, stabilized with 0.02 M sodium caprylate and 0.02 M sodium acetyltryptophanate.
	ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 0.2$ $\delta L/L = 0.0015$
	REFERENCES :
	 Yeh, SY.; Peterson, R. E. J. Pharm. Sci. 1963, 52, 453.
	 Geffcken, G. <u>Z. Phys. Chem</u>. 1904, <u>49</u>, 257.

		ORIGINAL MEASUREMENTS:	
 Xenon-133; ¹³³₅₄Xe; 14932-42-4 Water; H₂O; 7732-18-5 		Ladefoged, J.; Anderson, A. M. <u>Phys. Med. Biol</u> . 1967, <u>12</u> , 353-358.	
VARIABLES:		PREPARED BY:	
т/к: 310.15		A. L. Cramer	
EXPERIMENTAL VALUES:		······································	
	T/K Ostwald Coefficie L \pm Std. D	ent Determinations	
	Water; H ₂ O; 77	/32-18-5	
	310.15 0.0834 <u>+</u> 0.		
		e; 0.9% NaCl in water	
	310.15 0.078 <u>+</u> 0. Albumin, 200 g		
	$310.15 0.099 + \ 0.099$		
	<u></u>		
	AUXILIARY	INFORMATION	
METHOD/APPARATUS/PR		SOURCE AND PURITY OF MATERIALS:	
The technique desc and Ladefoged (1) materials were pla tubes together wit in an air tight ch	OCEDURE: ribed by Anderson was used. The ced in small test h a sample of water amber. The chamber	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Centre Amersham, U.K. Two per cent impurity of ¹³¹ Xe and ⁸⁵ Kr.	
The technique desc and Ladefoged (1) materials were pla tubes together wit in an air tight ch contained air and xenon-133. The sa continuously at 31 hours. After equi samples were trans syringes and sampl	OCEDURE: ribed by Anderson was used. The ced in small test h a sample of water amber. The chamber 0.5 to $2 \ \mu Ci$ of mples were stirred 0.15 K for 24 libration the ferred into es of about 0.1 ml	SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Centre, Amersham, U.K. Two per cent impurity of ¹³¹ Xe and ⁸⁵ Kr.	
The technique desc and Ladefoged (1) materials were pla tubes together wit in an air tight ch contained air and xenon-133. The sa continuously at 31 hours. After equi samples were trans syringes and sampl were counted in a counter. The Ostw	OCEDURE: ribed by Anderson was used. The ced in small test h a sample of water amber. The chamber 0.5 to 2 μ Ci of mples were stirred 0.15 K for 24 libration the ferred into es of about 0.1 ml scintillation vald coefficients	 SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Centre, Amersham, U.K. Two per cent impurity of ¹³¹Xe and ⁸⁵Kr. 2. Albumin. Statens Serum Institut, Cohn's fraction V, 97% albumin and 3% α and β globulin. Heat 	
The technique desc and Ladefoged (1) materials were pla tubes together wit in an air tight ch contained air and xenon-133. The sa continuously at 31 hours. After equi samples were trans syringes and sampl were counted in a counter. The Ostw were calculated in ratio of counts in sample and the mea ficient in water.	OCEDURE: pribed by Anderson was used. The ced in small test h a sample of water amber. The chamber $0.5 to 2 \ \mu Ci$ of mples were stirred $0.15 \ K$ for 24 libration the ferred into es of about 0.1 ml scintillation vald coefficients directly from the sware and the sured Ostwald coef- See the authors	 SOURCE AND PURITY OF MATERIALS; 1. Xenon-133. Radiochemical Centre, Amersham, U.K. Two per cent impurity of ¹³¹Xe and ⁸⁵Kr. 2. Albumin. Statens Serum Institut. Cohn's fraction V, 97% albumin and 3% α and β globulin. Heat treated 60°C for 10 hours. 	
The technique desc and Ladefoged (1) materials were pla tubes together wit in an air tight ch contained air and xenon-133. The sa continuously at 31 hours. After equi samples were trans syringes and sampl were counted in a counter. The Ostw were calculated in ratio of counts in	OCEDURE: pribed by Anderson was used. The ced in small test h a sample of water amber. The chamber $0.5 to 2 \ \mu Ci$ of mples were stirred $0.15 \ K$ for 24 libration the ferred into es of about 0.1 ml scintillation vald coefficients directly from the sware and the sured Ostwald coef- See the authors	 SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Centre, Amersham, U.K. Two per cent impurity of ¹³¹Xe and ⁸⁵Kr. 2. Albumin. Statens Serum Institut. Cohn's fraction V, 97% albumin and 3% α and β globulin. Heat treated 60°C for 10 hours. ESTIMATED ERROR: 	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Xenon; ¹³³ Xe; 14932-42-4	Kitani, K.	
2. Water, Saline Solution, Plasma, and Human Red Blood Cells		
	Scand. J. Clin. Lab. Invest. 1972, 29, 167-172.	
VARIABLES:	PREPARED BY:	
T/K: 310.15 P/kPa: 101.325 (1 atm)	P.L. Long A.L. Cramer	
EXPERIMENTAL VALUES:		
T/K Bunsen	Ostwald Replications	
1	Std. Dev.	
Water; H ₂ O; 7732-18-5		
310.15 0.0731 0.08	130 ± 0.0017 17	
Water + Sodium Chlorid 0.9 per cent Saline	le; NaCl; 7647-14-5	
310.15 0.0687 0.07	280 ± 0.0013 29	
Plasma (3 Samples)		
310.15 0.0839 0.09	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
0.0821 0.09 0.0830 0.09	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
Human Red Blood Cells	~	
310.15 - 0.19	966 -	
The Bunsen coefficients were calculate Ostwald coefficient was independent of The solubility value for red blood cel solubility of the gas in mixtures of p healthy donors. The coefficient of so cent (graph in paper). L = 0.09560 + (0.00101) (Here	pressure. Is is a value extrapolated from the plasma and heparinized blood from plubility is linear in hematocrit per	
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
A glass cuvette is filled with the	1. Xenon. Radiochemical Centre,	
liquid. One-third of the liquid is	Amersham, England.	
replaced with radioactive gas in air. The sealed cuvette is placed in a thermostated bath for 2 hours. The pressure is adjusted to 1 atm by means of a thin needle. The radioactive assay, corrected for self absorption and scatter, is made by a scintillation detector and a Philips pulse-height analyzer.	 Water and 0.9 per cent saline were prepared according to the criteria for purity in the Nordic Pharmacopeia. Heparinized blood from healthy donors was used. 	
1	"STIMATED ERROR:	
	See standard deviations above.	
	REFERENCES :	

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COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Xenon; Xe; 7440-63-3	Catchpool, J. F.	
2. Water; H ₂ O; 7732-18-5	<u>Fed</u> . <u>Proc</u> . 1968, <u>27</u> , 884 - 887.	
3. Sodium Chloride; NaCl; 7647-14-5		
4. Methemoglobin		
VARIABLES:	PREPARED BY:	
T/K: 278.15 - 308.15 P/kPa: 80.93 - 92.66 (607 - 695 mmHg)	H. L. Clever	
EXPERIMENTAL VALUES:		
	ry's Constant	
	$K \times 10^{-7}$	
	/mmHg)/(mol Xe/mol H ₂ O)	
278.15 283.15	0.28 0.34	
288.15 293.15	0.40 0.45	
298.15	0.52	
303.15 308.15	0.60 0.66	
······		
The author calculated that at 293.15 101.325 kPa (1 atm) 1.67 mole of xenor methemoglobin. The result is based o 0.88 x 10' in 0.5 per cent saline sol	n is combined with each mole of the n a xenon Henry's constant of	
AUXILIARY	INFORMATION	
METHOD: Volumetric apparatus with the gas pressure controlled by a quartz Bourdon tube, mirror-photocell, and a servomechanism. Measurements were made at all seven temperatures on one loading of the apparatus over a perio of four days. Spectroscopic and densi measurements before and after the experiment indicated no degradation of the sample. The sample was 0.00279 mole methemoglobin dm ⁻³ of 0.5 per cent saline solution.	4. Hemoglobin. Prepared from human type 0 Rh negative blood. Packed cells washed six times with 1 per cent saline. Lipids and cellular debris were dissolved in toluene.	

ORIGINAL MEASUREMENTS: COMPONENTS : Xenon; Xe; 7440-63-3 1. Ewing, G. J.; Maestas, S. 2. Water; H₂O; 7732-18-5 J. Phys. Chem. 1970, 74, 2341-2344. 3. Myoglobins VARIABLES: T/K: PREPARED BY: 293.15 - 303.15 50.663 - 491.426 Xe P/kPa: H. L. Clever (0.5 - 4.85 atm)**EXPERIMENTAL VALUES:** Henry's Constant K/m⁻¹ K'/m⁻¹ T/K K_H/mmHg X1⁻¹ Water 0.85×10^{7} 293.15 $0.96 \times 10'$ 298.15 1.13×10^{7} 303.15 Cyanometmyoglobin 293.15 186 298.15 145 303.15 115 Metmyoglobin 293.15 200 ∿8.2 298.15 146 ~7.2 303.15 130 ∿2.3 Myoglobin 293.15 109 2.3 298.15 94 2.6 303.15 85 0.5 The xenon solubility in the myoglobin solutions did not obey Henry's law. The xenon solubility data are presented graphically in the original paper. AUXILIARY INFORMATION METHOD / APPARATUS / PROCEDURE : SOURCE AND PURITY OF MATERIALS: Manometric method. The amount of 1. Xenon. No information. xenon absorbed by the solution was determined by measuring the initial pressure and the final pressure to 2. Horse heart myoglobin. Calbiochem. The myoglobin was obtain the pressure change, ΔP , and prepared by reduction of metmyoapplying the ideal gas law globin by sodium dithionite. The cyanometmyoglobin was pre- $\Delta \mathbf{n} = \frac{(\Delta \mathbf{P}) \mathbf{V}}{\mathbf{RT}}$ pared from metmyoglobin by reaction with KCN and K₃Fe(CN)₆ To determine the amount of xenon abin a phosphate buffer solution. sorbed by the hemoprotein, the amount of xenon calculated to dissolve in water at the temperature and equilib-ESTIMATED ERROR: rium pressure of the experiment was subtracted from Δn . This quantity $\delta T/K = 0.1$ divided by the number of moles of myoglobin in the ${\sim}10$ weight per cent solution (usually ${\sim}10^{-4}$ mol) yielded $\delta K_{\rm H}/\rm{mmHg} = 0.05$ (Compiler) The adsorptions were converted to the amount of xenon dissolved per association constants for the mole of myoglobin. reactions The xenon adsorptions in the hemo- $K = m_{HpXe} / m_{Hp} m_{Xe}$ Hp + Xe = HpXeprotein solutions were presented graphically. No appreciable differ- $HpXe + Xe = HpXe_{2}$ ence was noted in the results for $K' = m_{HpXe_2}/m_{HpXe}m_{Xe}$ where m is buffered (phosphate buffer pH 8.1) mol kg⁻¹ H_2O . and unbuffered (pH 6.95) metmyoglobin solutions.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon; Xe; 7440-63-3	Conn, H. L.
Xenon-133; ¹³³ xe; 14932-42-4	
Xenon-135; ¹³⁵ xe; 14995-63-1	J. <u>Appl</u> . <u>Physiol</u> . 1961, <u>16</u> , 1065-1070
2. Dog Tissues and Fat	
VARIABLES:	PREPARED BY:
T/K: 294.15 Xe P/kPa: 0.933 - 8.666 (7-65 mmHg)	A. L. Cramer H. L. Clever
EXPERIMENTAL VALUES:	
T/K $\frac{Xe (counts m^{-1})}{Xe (counts m^{-1})}$	
Fat	
294.15 19.70 <u>+</u>	0.40 2.32
Skeletal Muscle	
294.15 1.62 <u>+</u>	0.04 0.191
Cardic Muscle	0.05
294.15 1.79 <u>+</u>	0.05 0.211
Kidney 294.15 1.62 +	0.06 0.191
	0.08
Liver	0.04 0.207
294.15 1.75 <u>+</u> Brain Grey Matter	0.04 0.207
294.15 1.84 +	0.05 0.217
Brain White Matter	
294.15 3.00 +	
*Calculated by compiler by multiplying cm ³ Xe at 294.15 K and 101.325 kPa (1 factor was calculated from the data : in water.	l atm) g ⁻¹ water. The multiplying
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Sample tissues weighing less than 100 mg and 1 mm or less in thickness were placed in individual cuvettes. They were equilibrated with a radioxenon-air mixture varying from 7 to 65 mmHg in several experiments. The tissues were allowed to equili- brate with the gas mixture for 1 to 8 hours. After equilibration the tissues were almost instantaneously removed from the container and plunged into a bath of liquid nitro-	 Xenon. Air Reduction Sales. Specially purified. The gas was subjected to neutron bombardment in a nuclear reactor. Resultant xenon isotopes were mainly 133 Xe and ¹³⁵ Xe. Tissues. Taken within 10 minutes after sacrifice of the animal.
gen. The Radioxenon concentration in the frozen samples was determined	ESTIMATED ERROR:
by counting the radioactivity of each in a well-type scintillation counter. The count was compared with the count in a liquid unter comple coulibrated	36 determinations above.
in a liquid water sample equilibrated at the same xenon partial pressure.	REFERENCES :

ORIGINAL MEASUREMENTS:	
Yeh, S-Y.; Peterson, R.E.	
J. Appl. Physiol. 1965, 20, 1041-1047.	
<u>J. Appi. Physiol</u> . 1965, <u>20</u> , 1041-1047.	
PREPARED BY:	
A.L. Cramer	
Number of cm ³ Xe	
eterminations q ⁻¹ muscle*	
g muscle*	
3 – 3 –	
3 0.1049 - 0.1127	
d for dilution with saline solution of 1.07. The range of values reflects content found by analysis of their	
INFORMATION	
SOURCE AND PURITY OF MATERIALS:	
 Xenon. The Matheson Co. Re- search grade, maximum impurity 0.02% nitrogen and 0.05% krypton. Rabbit leg muscle. Homogenized with 4x's its volume of saline (w/w), then 0.05% mercury chloride added as microbial poison. 	
ESTIMATED ERROR: $\delta T/K = 0.05$ $\delta P/mmHg = 0.2$ $\delta L/L = 0.05$	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Xenon-133; ${}^{133}_{54}$ Xe; 14932-42-4	Kitani, K.; Winkler, K.
2. Human Liver Tissue	
	<u>Scand. J. Clin. Lab. Invest</u> . 1972, <u>29</u> , 173-176.
VARIABLES:	PREPARED BY:
T/K: 310.15	A.L. Cramer
EXPERIMENTAL VALUES:	
Thirty three measurements of the solut liver tissue with triglyceride conten- per cent. One measurement was made a The results were given in a graph. T	t varying between 1 and 20 weight
L = 0.09524 + (0.016447))(triglyceride wt %)
with a regression coefficient of 0.97	
solubility was corrected for the wate	
Tripalmitin is Hexadecanoic acid, 1,2 555-44-2.	,3-propanetriyl ester; C ₅₁ H ₉₈ O ₆ ;
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE: Five g of liver tissue was homogenized at 277 K for 15 m after addition of 5 cm ³ of water. A glass cuvette (1 x 1 x 10 cm) was 2/3 filled with the homogenate, and closed with a rubber stopper. The space above the homogenate was evacuated and filled with air con- taining xenon-133. The cuvette was rotated for 2 h in a water bath at 310 K. The radioactivity in the homogenate and in the air phase were determined by a scintillation counter placed in a thermostated box at 310 K (1). The triglyceride was determined enzymatically in chloroform- methanol extracts.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Xenon-133. Radiochemical Centre. Amersham, U.K. 2. Liver tissue. Autopsy material. 2. Liver tissue. Autopsy material. ESTIMATED ERROR: REFERENCES: 1. Kitani, K. Scand. J. Clin. Lab. Invest. 1972, 29, 167.</pre>

COMPONENTS: 1. Xenon; Xe; 7440-63-3		
	ORIGINAL MEASUREMENTS: Yeh, SY.; Peterson, R.E.	
	Yen, SY.; Peterson, R.E.	
2. Water; H ₂ O; 7732-18-5		
3. Sodium chloride; NaCl; 7647-14-5	J. Appl. Physiol. 1965, 20, 1041-1047.	
4. Beef brain		
4. Beer brain		
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 310.15	A.L. Cramer	
P/kPa: 101.325 (1 atm)		
EXPERIMENTAL VALUES:		
T/K Absorption Coefficient mean $\beta + Std.$ Dev.	Number of Determinations	cm ³ Xe g ⁻¹ muscle*
298.15 0.1174 + 0.0001	3	
303.15 $0.1059 + 0.0005$	3	-
310.15 0.0928 \pm 0.0010	3	0.164 - 0.186
AUXILIARY	INFORMATION	
	· · · · · · · · · · · · · · · · · · ·	OF MATERIALS.
AUXILIARY METHOD /APPARATUS/PROCEDURE: In Yeh and Peterson (1) modification of Geffcken (2) apparatus, 45 ml of liquid homogenate is frozen, evacu- ated, and melted repeatedly until no bubbles appear in liquid under vacuum. Equilibration with gas and measure- ment of solubility follow (1).	SOURCE AND PURITY 1. Xenon. Th Research g 0.02% nitr krypton. 2. Beef brain 4 x volume then mixed	e Matheson Co. rade, maximum impurity ogen and 0.05%

CONDONENTE		ODICINAL WEACHDENTRY	<u></u>	
COMPONENTS: 1. Xenon-133; ¹³³ ₅₄ Xe; 14932-42-4		ORIGINAL MEASUREMENTS: Veall, N.; Mallett, B. L.		
1. Aenon-133; 54				
2. Human Brain Components		Phys. Med. Biol. 1965, 10, 375-380.		
VARIABLES:		PREPARED BY:		
т/к: 310.15		A. L. C:	ramer	
EXPERIMENTAL VALUES:				
	T/K Solubilit			
	Coefficie S _T + Std Er	nt Determinations ror		
	Water			
	310.15 0.0903 <u>+</u> 0.	0005 9		
	Brain Grey Mat			
	310.15 0.1196 <u>+</u> 0.			
	Brain White Ma			
	310.15 0.2253 <u>+</u> 0.	0045 14		
	Brain Homogena	te*		
	310.15 0.1616 <u>+</u> 0.	0035 12		
		· · · · · · · · · · · · · · · · · · ·		
	*The fraction of gr brain was calculat			
	60.3 <u>+</u> 6.3 per cen			
	above.			
<u> </u>	· · · · · · · · · · · · · · · · · · ·			
	AUXILIARY	INFORMATION		
METHOD /APPARATUS/P	ROCEDURE:	SOURCE AND PURITY OF MA		
	rain material were	1. Xenon-133. No	information given.	
weighed, 1.0 ml of added and the mixt			Fresh post-mortem	
uniform fluid. Th	e one ml tissue	brains with no abnormality.	evidence of	
0.1 ml of air cont	led to a sample tube, aining about	abhormaricy.		
10 µCi of Xenon-1	.33 was added and			
the tube sealed.	The tubes were minutes for 2-3			
hours and left ove	ernight at 310 K.			
The tube was centr liquid phases each	ifuged and gas and counted. The			
solubility coeffic	ient, S _m , is the	ESTIMATED ERROR:	<u>_</u>	
gas tissue partiti referenced to 1 ml		See standard error	of mean above.	
tissue.	- · · · · -			
			······································	
		REFERENCES:		

COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Xenon-133; $\frac{133}{54}$	Xe; 14932-42-4	Isbister, W. H.; Schofield, P. F.;		
) Drain matarial		Torrance, H. B. Phys. <u>Med</u> . <u>Biol</u> . 1965, <u>10</u> , 243-250.		
2. Brain material.		<u>Inys</u> . <u>Med</u> . <u>BIO1</u> . 1903	, <u>10</u> , 243 230.	
VARIABLES:		PREPARED BY:		
т/к: 310.15		A. L. Crame	r	
EXPERIMENTAL VALUES:				
EXPERIMENTAL VALUES:				
	T/K Partitic			
	Coefficie			
	$S \pm Std Er$			
	Brain Grey Mat	ter		
	310.15 0.1466 + 0.			
	—			
	Brain white Ma			
	$310.15 0.2434 \pm 0$	0119 11		
	······			
The authors calcul	ated the partition of	coefficient of xenon-13	3 between blood	
and brain at varyi	ng haematocrit level	s. See Table II of or	iginal paper.	
			[
			}	
\				
	AUXILIARY INFORMATION			
		INFORMATION		
METHOD / APPARATUS / PR				
	OCEDURE:	SOURCE AND PURITY OF MATER		
Know weights of gr	OCEDURE: ey and white matter			
were collected in	OCEDURE: ey and white matter glass containers	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir	formation given.	
were collected in under a known volu	OCEDURE: ey and white matter glass containers me of saline. Fine	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem	nformation given. Fresh adult n material dis-	
were collected in under a known volu homogenates of the	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre-	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material.	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours.	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. nate phases were	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. nate phases were ally constructed	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. nate phases were ally constructed tached to a	 SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed tainer under sali 	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. nate phases were ally constructed tached to a tter. The parti- between gas and	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed	nformation given. Fresh adult n material dis- 1 in glass con-	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR:	formation given. Fresh adult n material dis- i in glass con- ine solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	 SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed tainer under sali 	formation given. Fresh adult n material dis- i in glass con- ine solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR:	formation given. Fresh adult n material dis- i in glass con- ine solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES:	formation given. Fresh adult n material dis- l in glass con- ne solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn	formation given. Fresh adult n material dis- i n glass con- ne solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn Broomell, H. T	formation given. Fresh adult material dis- in glass con- ne solution. me solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No in 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn	formation given. Fresh adult material dis- in glass con- ne solution. me solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn Broomell, H. T	formation given. Fresh adult material dis- in glass con- ne solution. me solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn Broomell, H. T	formation given. Fresh adult material dis- in glass con- ne solution. me solution.	
were collected in under a known volu homogenates of the pared. Two ml. sa homogenate were in special counting t air mixture was ad at 310 K was compl The gas and homoge counted in a speci lead collimator at scintillation coun tion coefficient b tissue was calcula homogenate partion	OCEDURE: ey and white matter glass containers me of saline. Fine material were pre- mples of the troduced into the ube and xenon-133 ded. Equilibration ete in two hours. mate phases were ally constructed tached to a ter. The parti- between gas and ted from the gas a coefficient by	SOURCE AND PURITY OF MATER 1. Xenon-133. No ir 2. Brain material. human post-mortem sected and placed tainer under sali ESTIMATED ERROR: See standard error of REFERENCES: 1. Kety, S. S.; Harn Broomell, H. T	formation given. Fresh adult material dis- in glass con- ne solution. me solution.	

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COMPONENTS: 1. Radon-222; ²²² 2. Water; H₂O; 7732-18-5 EVALUATOR: Rubin Battino Department of Chemistry Wright State University Dayton, Ohio, 45431 U.S.A. July 1978

CRITICAL EVALUATION:

Radon solubilities are special because we are dealing with a naturally radioactive isotope with a half-life of 3.8 days. The usual technique for determining the solubility of radon is to equilibrate it in a carrier gas like air or nitrogen with the liquid (or solution) it is to be dissolved in. The radon partial pressure is about 10^{-4} mm Hg (ca. 0.01 Pa). The solubility is then determined by measuring the radioactivity in the equilibrated gaseous phase and liquid phase. From this the Ostwald coefficient, L, is calculated at a given temperature according to

 $L = \frac{\text{concentration of gas per unit volume of liquid phase}}{\text{concentration of gas per unit volume of gas phase}}$ (1)

The Ostwald coefficient is normally defined as

 $L = \frac{\text{volume of gas at its partial pressure and } T/K}{\text{volume of solvent used to absorb the gas at } T/K}$ (2)

These two definitions are equal if there is no volume change on mixing or negligible volume change on mixing. For the radon partial gas pressure used in the experimental measurements, the latter is certainly the case. The mole fraction solubility at 101,325 Pa is then calculated via equation 3 with $P_1 = 101,325$ Pa.

	г	-	1 -1	
×1 =	$\frac{R(T/K)}{V_1^{\circ} L P_1}$	+ 1		(3)

where R is the gas constant and V_1^0 is the molar volume of the solvent at T/K. The long extrapolation from 0.01 Pa to 101,325 Pa using Henry's law is questionable. However, by making this conversion we can treat the thermodynamic functions of all of the noble gases under the same standard state conditions. Boyle (1) did carry out a test of Henry's law by varying the Rn + Air pressure from 10^{-5} mm Hg to 10^{-4} mm Hg. The solubility (Ostwald Coefficient) at 14° C varied irregularly from 0.299 to 0.307 which was considered to be within experimental error.

We used the data of three workers for smoothing. In fitting the equation those data points which differed from the smoothed curve by about two standard deviations or more were rejected and the data then re-fitted. The 40 points used for the final smoothing equation were obtained as follows (reference - number of data points used from that reference): 1-2; 2-6; 3-32. The fitting equation used was

$$\ln x_{1} = A + B/(T/100K) + C \ln (T/100K)$$
(4)

Using T/K as the variable rather than T/K gives coefficients of approximately equal magnitude. The best fit for the 40 data points was

 $\ln x_1 = -90.5481 + 130.026/(T/100K) + 35.0047 \ln (T/100K)$ (5)

where x_1 is the mole fraction solubility of radon at 101,325 Pa partial pressure of gas. The fit in ln x_1 gave a standard deviation of 1.02% taken at the middle of the temperature range. Table 1 gives smoothed values of the mole fraction solubility at 101,325 Pa partial pressure of gas and the Ostwald coefficient at 5K intervals.

222		EVALUATOR:	EVALUATOR:			
1. Radon-222; ² 86Rn; 14859-67-7 2. Water; H ₂ O; 7732-18-5		Departmen Wright S	Rubin Battino Department of Chemistry Wright State University Dayton, Ohio, 45431 U.S.A.			
			July 1978			
ALUATION:	<u></u>					
thermodynam fraction so	ic functions ^a lubility at lo	using equation 01 325 Pa part	on 2. Mole tial pressure			
ol Fraction $X_1 \times 10^4$	Ostwald Coefficient L	∆G ₁ /KJmol ^{-1b}	∆H [°] 1/KJmol ⁻¹	∆\$\$°,/JK-1 ^{mo1-1}		
4.217	0.5249	17.65	-28.61	-169		
		-		-164 -159		
				-159		
1.945	0.2593	20.83	-22.79	-149		
	0.2263	21.56	-21.33	-144 -139		
1.288	0.1797	22.95	-19.88	-139		
1.153	0.1632	23.61	-16.97	-130		
			-15.51	-125 -120		
0.889	0.1310	25.45	-12.60	-116		
0.833	0.1243	26.02	-11.15	-112		
				-107 -103		
0.724	0.1119	27.60	-6.78	-103		
0 - · · ·	0 1000			-95		
0.703	0.1099	28.08	-5.33			
0.688	0.1087	28.54	-3.87	-91		
0.688 0.678 0.673						
0.688 0.678	0.1087 0.1082	28.54 28.98	-3.87 -2.42	-91 -86		
0.688 0.678 0.673 0.672 s independen	0.1087 0.1082 0.1085	28.54 28.98 29.41 29.81	-3.87 -2.42 -0.96 0.49	-91 -86 -82 -79		
0.688 0.678 0.673 0.672	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81	-3.87 -2.42 -0.96 0.49	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81	-3.87 -2.42 -0.96 0.49	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81	-3.87 -2.42 -0.96 0.49	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095 t of temperatu	28.54 28.98 29.41 29.81 ure and has a	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
0.688 0.678 0.673 0.672 s independen 4.184 joule	0.1087 0.1082 0.1085 0.1095 t of temperatu	28.54 28.98 29.41 29.81 ure and has a Rad	-3.87 -2.42 -0.96 0.49 value of 291	-91 -86 -82 -79		
	ALUATION: Smoothed va thermodynam fraction so of radon. pressure. ol Fraction $x_1 \times 10^4$ 4.217 3.382 2.764 2.299 1.945 1.671 1.457 1.288 1.153 1.046 0.959 0.889 0.833 0.788 0.752	ALUATION: Smoothed values of radon thermodynamic functionsa fraction solubility at 1 of radon. Ostwald coeff pressure. ol Fraction Ostwald $x_1 \times 10^4$ Coefficient $x_1 \times 10^4$ Coefficient 4.217 0.5249 3.382 0.4286 2.764 0.3565 2.299 0.3016 1.945 0.2593 1.671 0.2263 1.457 0.2003 1.288 0.1797 1.153 0.1632 1.046 0.1500 0.959 0.1395 0.889 0.1310 0.833 0.1243 0.788 0.1190 0.752 0.1149	2Dayton, U.S.A. July 197ALUATION:Smoothed values of radon solubility i thermodynamic functions ^a using equation fraction solubility at 101 325 Pa part of radon. Ostwald coefficient at equ pressure.ol Fraction X1 x 1044.217 Coefficient L4.217 4.217 2.299 2.299 0.3016 1.945 0.2593 1.651 1.651 1.6711.945 0.2593 2.299 2.299 2.299 0.3016 1.945 0.2593 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.295 1.153 0.1632 2.3.61 1.046 0.1500 2.4.25 0.889 0.1310 2.5.45 0.889 0.1310 2.5.45 0.883 0.1243 2.6.02 0.788 0.1190 2.6.57 0.752 0.1149 2.7.09	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $		

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FIGURE 1. The mole fraction solubility of radon in water at a radon partial pressure of 101.325 kPa (1 atm).

COMPONENTS:EVALUATOR:1. Radon-222; ${}^{222}_{86}$ Rn; 14859-67-7Rubin Battino
Department of Chemistry
Wright State University
Dayton, Ohio, 454312. Water; H20; 7732-18-5Wright State University
Dayton, Ohio, 45431July 1978

CRITICAL EVALUATION:

Table 1 also gives the thermodynamic functions $\Delta \overline{G}_1^{\circ}$, $\Delta \overline{H}_1^{\circ}$, $\Delta \overline{S}_1^{\circ}$, and $\Delta \overline{C}_{p_1}^{\circ}$ for the transfer of gas from the vapor phase at 101,325 Pa partial gas pressure to the (hypothetical) solution phase of unit mole fraction. These thermodynamic properties are calculated from the smoothing equation according to the following equations:

 $\Delta \overline{G}_{1}^{\circ} = -RAT - 100RB - RCT \ln (T/100K)$ (6) $\Delta \overline{S}_{1}^{\circ} = RA + RC \ln (T/100) + RC$ (7) $\Delta \overline{H}_{1}^{\circ} = -100RB + RCT$ (8) $\Delta \overline{C}_{p_{1}}^{\circ} = RC$ (9)

The results from three other workers was rejected for various reasons. The single point of Hofbauer's (4) was high by about 7%. Hofmann's seven values (5) were erratically high and low between 1 and 11%. Ramstedt's three measurements (6) were also high by about 2 to 4%. Although many references quote Valentiner (7), he used other people's data for his paper.

Figure 1 shows the temperature dependence of the solubility of radon in water. The curve was obtained from the smoothing equation. There appears to be a minimum at about 363K for the Ostwald coefficient. The mole fraction solubility minimum is at 371.45 according to the fitted equation although there is no minimum evident over the temperature range of the experimental measurements.

References

- 1. Boyle, R. W. Phil. Mag. 1911, 22, 840.
- Kofler, M. <u>Sitz. Akad. Wiss. Wien</u> 1912, <u>121</u>, 2169; <u>Monatsh.</u> 1913, <u>34</u>, <u>389</u>.
- 3. Szeparowicz, M. Sitz. Akad. Wiss. Wien 1920, 129, 437.
- 4. Hofbauer, G. Sitz. Akad. Wiss. Wien 1914, 123, 2001.
- 5. Hofmann, R. Phys. Z. 1905, 6, 337.
- 6. Ramstedt, E. J. Phys. Radium 1911, 8, 253.
- 7. Valentiner, S. Z. Physik. 1927, 42, 253.

COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Radon-222; ²²² / ₈₆ Rn; 14859-67-7		Hofmann, R.		
		<u>Phys. Z. 1905, 6</u> , 337-340.		
2. Water; H ₂ O; 7732-18-5				
2		1		
VARIABLES:	······	PREPARED BY:		
T/K: 273.15 -	353.15	R. Battino		
EXPERIMENTAL VALUES:				
EXPERIMENTAL VALUES:		······································		
	T/K Mol Frad	ction Ostwald		
	x ₁ x 1	4 Coefficient ^a		
	<u></u>			
2	73.15 4.17	78 0.52		
	76.15 1.94	47 0.245		
2	93.15 1.72	25 0.23		
	13.15 1.20	0.17		
	33.15 0.90			
	43.15 0.78			
3	53.15 0.76	68 0.12		
		······································		
The mole fraction solub calculated by the compi		25 Pa partial pressure of radon was		
		INFORMATION		
METHOD /APPARATUS/PROCEDU	RE:	SOURCE AND PURITY OF MATERIALS:		
Radon in a carrier g		1. Radon		
is equilibrated with wa				
taken of each phase to	determine the	2. Water		
radon concentrations and				
Ostwald coefficient. T				
pressure was of the ord	er or			
10^{-4} mmHg.				
		ESTIMATED ERROR:		
		$\delta X_1 / X_1 = 0.05 \text{ (compiler)}$		
		$1^{1/1}$		
		REFERENCES :		

•

		+		
COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7		Ramstedt, E. J. Phys. <u>Radium</u> 1911, <u>8</u> , 253-256.		
2. Water; H ₂ O; 7732-18-5				,,,
		<u> </u>		
VARIABLES:		PREPARED BY:		
т/к: 273.15 - 2	91.15		R. Batt	ino
EXPERIMENTAL VALUES:			· · · · · · · · · · · · · · · · · · ·	
	T/K Mol Fra	ction 4	Ostwald Coefficient ^a L	L
	<u>X₁ x</u>	10-		-
	3.15 4.1		0.52	
	2.15 3.0 1.15 2.1		0.39 0.285	
—				-
^a Ostwald coefficient.Sin	ce the origin	al mea	surements wer	e made in terms
of radon concentrations there is a negligible v	; in the gas a	nd liqu	uid phase, it	is assumed that
				<u> </u>
The mole fraction solubi calculated by the compil		25 Pa j	partial press	sure of radon was
	AUXILIARY	INFORM/	ATION	
METHOD/APPARATUS/PROCEDUF	æ:	SOURCE	ATION 2 AND PURITY OF	MATERIALS :
Radon in a carrier ga	E: s such as air	SOURCE		MATERIALS :
	E: s such as air er and counts	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an	E: s such as air er and counts adon concen- d hence the	SOURCE	AND PURITY OF	MATERIALS:
Radon in a carrier ga is equilibrated with wat taken to determine the r	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF Radon - Water -	MATERIALS:
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE 1. 1 2. 1 ESTIMA	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE 1. 1 2. 1 ESTIMA	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE 1. 1 2. 1 ESTIMA	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE 1. 1 2. 1 ESTIMA	AND PURITY OF Radon - Water -	MATERIALS :
Radon in a carrier ga is equilibrated with wat taken to determine the r tration in each phase an Ostwald coefficient. Th partial pressure is of t	E: s such as air er and counts adon concen- d hence the e radon	SOURCE 1. 1 2. 1 ESTIMA	AND PURITY OF Radon - Water -	MATERIALS :

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COMPONENTS:	ORIGINAL MEASUREMENTS:		
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Boyle, R. W.		
••	Phil. Mag. 1911, 22, 840-854.		
2. Water; H ₂ O; 7732-18-5			
-			
VARIABLES:	PREPARED BY:		
T/K: 273.15 - 312.25	R. Battino		
EXPERIMENTAL VALUES:			
•	Fraction Ostwald		
X,	x 10 ⁴ Coefficient ^a L		
	4.066 0.506		
	3.354 0.424 3.133 0.398		
	2.636 0.340		
	2.318 0.303		
	2.117* 0.280		
	1.838 0.245		
	1.513 0.206 1.397* 0.193		
	1.397* 0.193 1.262 0.176		
	1.218 0.170		
	1.133 0.160		
 concentrations this assumes that solution are identical within exp * solubility values which were used recommended values given in the optimized 	d in the final smoothing equation for the		
AUXILI	LARY INFORMATION		
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
Radon in a carrier gas such as a	air 1. Radon -		
is equilibrated with the degassed			
water. Counts are made of the satu			
rated solution and the equilibrated			
gas phase to determine the Ostwald coefficient. The Rn partial press	170		
ranged from 0.00001 to 0.0001 mm He			
	, ·		
	ESTIMATED ERROR:		
	REFERENCES:		

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ${}^{222}_{86}$ Rn;14859-67-7	Kofler, M. <u>Sitzber. Akad. Wiss. Wien</u> 1912, <u>121</u> , <u>2169-80; Monatsh. 1913, 34</u> , 389.
2. Water; H ₂ O; 7732-18-5	
VARIABLES:	PREPARED BY:
T/K: 273.65 - 364.15	R. Battino
EXPERIMENTAL VALUES:	
T/K Mol Frac X ₁ x 1	
273.65 4.22	
290.65 2.14 308.15 1.32	
314.15 1.13	34* 0.161
	16* 0.138
333.15 0.85 347.15 0.72	51 0.127 26* 0.112
	2* 0.111
355.15 0.70 364.15 0.67	
the recommended values given in the of The mole fraction solubility at 101.32 calculated by the compiler.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Radon in a carrier gas such as air	1. Radon -
is equilibrated with water and counts taken to determine the radon concen- tration in each phase and hence the Ostwald coefficient. The radon partial pressure was of the order of	2. Water -
10^{-4} mm Hg.	
	ESTIMATED ERROR:
	REFERENCES :

COMPONENTS	3:		ORIGINAL 1	MEASUREMENTS:	******
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7			Szeparowicz, M.		
••		Sitz. A	kad. Wiss. Wie	en.	
2. Water; H ₂ O; 7732-18-5		1920, 1	29, 437-454.		
VARIABLES	:		PREPARED	BY:	
	Г/К: 273.15 -	370.15		R. Battir	10
EXPERIMENT	TAL VALUES:				
т/к	Mol Fraction	Ostwald	T/K	Mol Fraction	
	$x_{1} \times 10^{4}$	Coefficient ^a L		x ₁ × 10 ⁴	Coefficient L
273.15	4.122	0.513	323.15	0.969*	0.141
273.75	4.057	0.506	328.15	0.903*	0.133
274.15 275.55	3.987	0.498	334.15	0.822*	0.123
276.35	3.807* 3.653*	0.478 0.460	338.15 340.65	0.794* 0.757*	0.120 0.115
276.95	3.598	0.454	341.65	0.768*	0.117
277.15	3.556	0.449	347.15	0.739*	0.114
278.85	3.290*	0.418	349.15	0.710*	0.110
280.45 282.95	3.068*	0.392	350.55	0.708*	0.110
284.85	2.855 2.590*	0.368 0.336	353.75 355.15	0.690* 0.688*	0.108 0.108
285.95	2.473*	0.322	359.05	0.682*	0.108
289.15	2.204*	0.290	362.65	0.671*	0.107
290.65	2.163	0.286	363.65	0.669*	0.107
292.15 293.15	2.017* 1.950*	0.268 0.260	364.15 365.15	0.687* 0.674*	0.110 0.108
299.45	1.589*	0.216	366.35	0.666*	0.107
308.15	1.283*	0.179	368.05	0.676*	0.109
315.15	1.103*	0.157	368.95	0.712	0.115
317.75 318.15	1.088 1.017	0.156 0.146	369.15 370.15	0.687* 0.673*	0.111 0.109
^a Ostwald coefficient. Since the orig: radon concentrations in the gas and is a negligible volume change on mix:		liquid ph	urements were ase, it is ass	made in terms of sumed that there	
	<u>er</u>	AUXILIARY	INFORMATIC	DN	
METHOD/AI	PPARATUS/PROCE	DURE:	SOURCE AN	D PURITY OF MATE	RIALS:
Rador	n in a carrier	gas such as air	1	on -	
		water and counts			
		e radon concen- and hence the	2. Water -		
		The radon par-			
	essure is of th				
10^{-4} mm					
10					
	lity values whi				
	final smoothin e recommended v				
	critical evalua		ESTIMATED	ERROR:	
			1		
mh	- f uert ! =				
	e fraction solu Pa partial pre	essure of radon			
	culated by the		REFERENCE	:S :	
	4	-		·~ •	
			J		

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon-222; $\frac{222}{86}$ Rn; 14859-67-7	Vdovenko, V. M.;Gurikov, Yu. V.; Legin, E. K.
2. Water-d ₂ ; D ₂ O; 7789-20-0	<u>Radiokhimya</u> 1970, <u>12</u> , 670 - 673.
	Soviet Radiochemistry 1970, 12, 631 - 633.
VARIABLES:	PREPARED BY:
T/K:279.15 - 288.15	H. L. Clever

EXPERIMENTAL VALUES:

Т/К	Ratio ^L D ₂ 0 ^{/L} H ₂ 0	Ostwald Coefficient ^L D ₂ O	Mol Fraction 101.325 kPa Rn $x_1 \times 10^4$
279.15	1.09	0.450	3.57
283.15	1.08	0.385	3.00
288.15	1.07	0.323	2.48

The authors reported only the ratio ${\rm L}_{\rm D_2O}$ / ${\rm L}_{\rm H_2O}.$

The compiler estimated the Ostwald coefficient and mole fraction. The Ostwald coefficient was obtained by multiplying the ratio times the Ostwald coefficient recommended in the critical evaluation for radon in H_2O . For the mole fraction calculation it was assumed that the Ostwald coefficient was independent of pressure and that the gram mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa.

AUXILIARY INFORMATION			
ME THOD:	SOURCE AND PURITY OF MATERIALS:		
The distribution of radon between the aqueous and gas phase was measured. The vessel for the dissolution of radon was of thin-walled Plexiglass with a volume of about 100 cm ³ , divid- ed into two portions by a 10 mm thick partition. The partition has three vertical openings. The vessel was filled with water to the partition. The upper part of the vessel contained radon + air at a low pressure. A magnetic stirrer causes the water to circulate up through two of the partition openings and back down through the center opening. It was established that gas/liquid equilibrin	2. Water. No information given. ESTIMATED ERROR: δT/K = 0.05		
was reached in 20 minutes or less.			
After equilibrium was established, the gas phases was displaced by air, and the radon activity determined. Again equilibrium was established, the gas phase was displaced by air and the radon activity was determined. The distribution coefficient was calculate from the activities and gas and liquid			

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² Rn; 14859-67-7 86	Boyle, R.W.
2. Sea water	
	<u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840-854.
VARIABLES:	PREPARED BY:
T/K: 287.15	W. Gerrard
	May 1977
EXPERIMENTAL VALUES:	······
	Ostwald
T/K	Coefficient
	L
287.15	0.255
207.15	0.233
Boyle defined the coefficient of solu	hiliv, s. as $(e_1/V_1)/(e_2/V_1)$ where
e_1 is emanation in volume V_1 of liquid	
of gas. The partial pressure of rado is also saturated with carrier gas (a	
pressure, originally about 101 kPa.	ii of another gas, at the prevailing
The mole fraction solubility at 101.3 compiler. It was assumed that the Os	25 kPa (1 atm) was calculated by the twald coefficient was independent of
pressure and that the gram-mole volum	e of radon is 22,290 cm ³ at 273.15 K
and 101.325 kPa.	
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Radon-222 in a carrier gas (air, or	1. Radon-222.
other gas not specified) is shaken with a measured volume of liquid.	2. Sea water. Specific gravity
with a measured vorume of figura.	at 287.15 K is 1.022.
Radioactivity is determined in the	
gas and liquid phases by gamma-ray	
electroscope.	
APPARATUS / PROCEDURE :	ESTIMATED ERROR:
The sampling bulb and mixing bulb	$\delta T/K = 0.2$
are connected by a three-way tap.	$\delta L/L = 0.03$
For the measurement of radioactivity,	
the bulbs are separately placed near to the electroscope. A diagram is	REFERENCES:
given by Boyle.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Kofler, M.
2. Sea water	
	<u>Phys</u> . <u>Zeit</u> ., 1908, <u>9</u> , 6-8.
VARIABLES: T/K: 291.15	PREPARED BY: W. Gerrard May 1977
EXPERIMENTAL VALUES: T/K	Ostwald oefficient L
291.15	0.165
The absorption coefficient (Ostwald co centration of radon in the liquid phas and radon) at a partial pressure of ra	e and that in the gaseous phase (air
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	 Radon. Not specified. Sea water. Specific gravity 1.028 at 291.15 K.
APPARATUS / PROCEDURE :	ESTIMATED ERROR:
Two glass bulbs connected by a tap. Each bulb has also a separate tap. Radioactivity measured by an aluminum	
leaf electroscope.	REFERENCES: 1. Kofler, M. <u>Sitzungber. Akad. Wiss. Wien</u> , <u>Abt 2A</u> , 1912, <u>121</u> , <u>2169</u> . 2. Kofler, M.
	<u>Abt</u> 2A, <u>Monatsh</u> ., 1913, <u>34</u> , 389.

COMPONENTS:EVALUATOR:1. Radon-222; ${}^{222}_{86}$ Rn; 14859-67-7H. L. Clever
Chemistry Department2. Water; H20; 7732-18-5H. L. Clever
Chemistry Department3. ElectrolyteU.S.A.
August 1978CRITICAL EVALUATION:EVALUATION:

The solubility of radon in aqueous electrolyte solutions.

The solubility of radon in aqueous electrolyte solution was measured by Kofler (1,2) who worked with radon-222, and by Hevesy (3) who worked with radon-219. Hevesy's results on two systems were only qualitative and of doubtful value (see p.). Kofler determined the solubility of radon-222 in aqueous solutions of thirteen electrolytes. The $\rm NH_4NO_3$, NaCl and Ba ($\rm NO_3$)₂ solutions were extensively studied as a function of temperature and electrolyte concentration.The other solutions were studied only at a temperature of 291.15 K.

Kofler measured the solubility of radon-222 at a radon partial pressure of less that 0.1 kPa in the presence of air as a carrier gas at a pressure of about 100 kPa. Kofler reported the radon solubility, as the equivalent of an Ostwald coefficient, and the electrolyte solution density.

In order to be able to compare the radon solubilities in electrolyte solutions with the other noble gases Kofler's data was converted into a Setschenow salt effect parameter. The solution density values were converted to molalities by the aid of the density data in The International Critical Tables (4). Kofler's (5) radon in water Ostwald coefficients were fitted to the equation

 $\ln L^{O} = -82.0146 + 126.823/(T/100) + 34.7934 \ln (T/100)$

to obtain L^{O} values at the various temperatures needed in the calculation. The Setschenow salt effect parameter was calculated as

 $k_r = (1/m) \log (L^0/L)$

where

m is the mole salt kg⁻¹ water (molality), L^O is the Ostwald coefficient in water, and

 ${\tt L}$ is the Ostwald coefficient in the electrolyte solution of molality ${\tt m}.$

The results of the calculation are given in Table 1.

For the other noble gases the Setschenow salt effect parameter was calculated as $k_s = (1/m) \log (S^{\circ}/S)$ and $k_{SX} = (1/m) \log (X^{\circ}/X)$ where S°/S is the gas solubility ratio with S in cm³ (STP) gas kg⁻¹ water and X^o/X is the gas solubility ratio with X the mole fraction with respect to water and the electrolyte ions. The k_L , k_S and k_{SX} values for radon + water + sodium chloride at 291.15 K are compared below.

Mol NaCl kg⁻¹ water 0.220 0.542 1.00 2.59 3.35

^k L	0.313	0.262	0.235	0.179	0.167	0.133
^k s	0.303	0.253	0.227	0.171	0.159	0.124
^k sx	0.319	0.269	0.242	0.186	0.174	0.138

6.20

The k_L and k_{SX} values are usually within 1-4 percent of each other. Thus the magnitude and trends in k_L shown in Table 1 are also representative of the k_{SX} values.

	EVAT HATOD -			
COMPONENTS: 1. Radon-222; 222 86Rn; 14859-67-7	EVALUATOR:			
00	H. L. Clever Chemistry Department			
2. Water; H ₂ O; 7732-18-5	Emory University Atlanta, GA 30322			
3. Electrolyte	U. S. A.			
	August 1978			
CRITICAL EVALUATION:				
TABLE 1. The Setschenow salt effect pa	rameter of radon in aqueous salt			
$\frac{\text{solutions.k}_{L} = (1/m) \log (L^{O}/m)}{1/m}$	(L) .			
Ammonium Nitrate; NH ₄ NO ₃ ; 6484-5	2-2			
T/K mol salt kg ⁻¹ water				
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$				
288.65 0.095 0.072 0.066 0.050				
309.95 - 0.047 0.038 0.034				
Ammonium Chloride; NH ₄ Cl; 12125-	02-9			
$\frac{T/K}{291.15} \frac{4.79 \text{ mol salt } \text{kg}^{-1} \text{ water}}{0.097}$				
Copper Sulfate; CuSO ₄ ; 7758-98-7	,			
<u>T/K</u> mol salt kg ⁻¹ water 0.276 0.511 0.572 0.724 1.				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>336</u> 428			
Silver nitrate; AgNO ₃ ; 7761-88-8				
$\frac{T/K}{291.15} \frac{1.43 \text{ mol salt } \text{kg}^{-1} \text{ water}}{0.115}$				
Zinc Sulfate; ZnSO ₄ ; 7732-02-0				
$\frac{T/K}{1.30} \xrightarrow{\text{mol salt } kg^{-1} \text{ water}}$				
291.15 0.372 0.341				
Mercury (II) Chloride; HgCl ₂ ; 74	87-94-7			
$\frac{T/K}{291.15} = \frac{0.226 \text{ mol salt } \text{kg}^{-1} \text{ water}}{0.218}$				
Lead Nitrate; Pb(NO3)2; 10099-74	-8			
T/K mol salt kg ⁻¹ water				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				
Ferrous Sulfate; FeSO ₄ ; 7720-78-	-7			
$\frac{T/K}{291.15} \frac{1.58 \text{ mol salt } \text{kg}^{-1} \text{ water}}{0.341}$				
Barium Nitrate; Ba(NO ₃) ₂ ; 10022-	-31-8			
_T/K mol salt kg ⁻¹ wate	er			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\frac{271}{-}$ 0.298			
274.75 1.34				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				
281.55 0.	.284 -			
286.95 0.560				
287.75 – – – 288.15 1.43 – –	- 0.366			
300.65 1.09	- 0.290			
$\frac{314.55}{-}$ - 0.305				

```
COMPONENTS:
                                           EVALUATOR:
   Radon-222; 222
86<sup>Rn</sup>; 14859-67-7
1.
                                           H. L. Clever
                                           Chemistry Department
2. Water; H<sub>2</sub>O; 7732-18-5
                                           Emory University
                                           Atlanta, GA 30322
3. Electrolyte
                                           U.S.A.
                                           August 1978
CRITICAL EVALUATION:
TABLE 1. The Setschenow salt effect parameter of radon in aqueous salt
          solution (continued). k_L = (1/m) \log (L^O/L).
      Sodium Chloride; NaCl; 7647-14-5
                                   mol salt kg<sup>-1</sup> water
 T/K
         0.220
                0.245
                        0.542
                                       1.87 2.59
                                                                               6.65*
                                1.00
                                                               3.35
                                                                       4.05
                                                       2.80
273.35
                   -
                                  -
                                                         _
                                          _
                                                                       0.179
                                                                 -
273.65
                 0.412
                          -
                                  -
                                          _
                                                  -
                                                         _
                                                                       0.178
                                                                                 _
                          -
273.95
           -
                 -
                                  -
                                        0.199
                         -
                                  -
                                                                        -
                                                                                 -
274.95
          . . . . . . . . . .
                  -
                                                  -
                                                       0.179
                                                                 -
                                                                 - 0.166
- 0.162
- 0.155
- 0.155
- 0.151
- 0.140
                                                                         -
                                                                                 ----
                  277.15
                   -
                                                  _
                                                       0.177
278.95
                                                       -
                                                                                 -
279.65
                                                  -
280.35
                                                                      0.162 0.139
                                                     -
0.172
282.65
                                                 _
                                                                                 -
282.95
                                                       -
283.15
                                                  -
                                                                             0.139
284.65
                                                 -
                                                         -
                                                                                -
285.95
                                                         -
                                                                                 ----
286.95
                                        -
                                                  -
                                                      0.166
                                                                 -
                                                                         -
                                                                                 -
           -
                                                                -
288.65
                                                 -
                                                      0.159
                                                                        -
                                                                                 _
290.15
                                                                              0.126
                                                        -
291.15 0.313
                                          - 0.179
                                                               0.167 -
                                                                             0.133**
297.35
          -
                                                       0.172
                                               -
                                                                -
298.35
                                          -
                                                 -
                                                                      0.140
                                                                -
298.85
           -
                                          -
                                                       0.163
                                                 ----
                                                                                -
305.35
           _
                                                       <del>.</del> .
                  -
                          -
                                  _
                                          -
                                                                 -
                                                                       0.130
                                                                                -
323.65
                                                                       0.113
                                                                                _
      Potassium Ferrocyanide; K<sub>4</sub>Fe(CN)<sub>6</sub>; 13943-58-3
        0.490 mol salt kg<sup>-1</sup> water
Т<u>/К</u>
291.15 0.895
      Potassium Permanganate; KMnO<sub>4</sub>; 7722-64-7
        0.380 mol salt kg<sup>-1</sup> water
 T/K
\frac{1}{291.15} \frac{0.300}{0.419}
```

Potassium Chloride; KCl; 7447-40-7

 $\frac{T/K}{291.15} \xrightarrow[0.274]{\text{mol salt } kg^{-1} \text{ water}} \frac{1.62}{0.274} \xrightarrow[0.228]{1.62} \frac{2.42}{0.200} \xrightarrow[0.161]{4.63}$

* molality greater than saturation of NaCl (?). ** value at 6.20 mol salt $kg^{-1} H_2O$.

COMPONENTS :	EVALUATOR:
1. Radon-222; 222 86 ^{Rn} ; 14859-67-7	H. L. Clever Chemistry Department
2. Water; H ₂ O; 7732-18-5	Emory University Atlanta, GA 30322
3. Electrolyte	U.S.A.
	August 1978

CRITICAL EVALUATION:

In general the magnitude of the salt effect parameter is greater for radon than the other noble gases for a given electrolyte concentration and temperature. The trends observed in the salt effect parameter in the radon + water + barium nitrate deserve special note. There is little accurate salt effect data at electrolyte concentrations below 0.1 molal. Kofler made measurements in 0.0346 and 0.0630 molal Ba $(NO_3)_2$ that give a much larger value of the salt effect parameter than the values at higher concentration of Ba $(NO_3)_2$. Such a trend is hinted in other systems but the difficulty of making accurate measurements in the dilute salt solutions has caused the effect to be doubted. The salt effect in dilute salt solutions deserves more investigation.

REFERENCES.

- 1. Kofler, M. Phys. Z. 1908, 9, 6.
- Kofler, M. <u>Sitzungsber</u>. <u>Akad</u>. <u>Wiss</u>. <u>Wien</u>, <u>Math</u>. <u>Naturwiss</u>. <u>K1</u>. <u>Abt</u>. <u>2A</u>, 1913, <u>122</u>, 1473.
- 3. Hevesy, G. Phys. Z. 1911, 12, 1214; J. Phys. Chem. 1912, 16, 429.
- International Critical Tables, Washburn, E. W., Editor McGraw Hill Co. 1928, Vol. III.
- Kofler, M. <u>Sitzungsber</u>. <u>Akad</u>. <u>Wiss</u>. <u>Wien</u>, <u>Math</u>. <u>Naturwiss</u>. <u>Kl</u>. <u>Abt</u>. <u>2A</u> 1912, <u>121</u>, 2169.

COMPONENTS: 222 1. Radon; 86Rn; 14859-67-7	ORIGINAL MEASUREMENTS: Kofler, M.			
2. Water; H ₂ O; 7732-18-5				
3. Ammonium chloride; NH ₄ Cl; 12125-02-9	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.			
VARIABLES:	PREPARED BY:			
т/к: 291.15	W. Gerrard			
Specific Gravity: 1.078				
EXPERIMENTAL VALUES:				
T/K Specific Ammonia Gravity Chlorid mol kg	de Coefficient			
291.15 - 0.1	0.280			
1.078 4.				
The solubility in water was interpolar reference (1).	ted from the author's data in			
The ammonium chloride molality was taken from the International Critical				
The author reported his solubility values as an Absorption Coefficient = (Concentration of Rn in the liquid phase)/(Concentration in the gas phase). We have labelled it as an Ostwald coefficient. The solubility was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at a pressure of about 100 kPa				
AUXILIARY	INFORMATION			
ME THOD :	SOURCE AND PURITY OF MATERIALS:			
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified			
	ESTIMATED ERROR:			
APPARATUS/PROCEDURE:				
The apparatus consisted of two glass bulbs connected by a tap. Each bulb				
had a separate tap. The assembly is shaken. Radioactivity is measured by	REFERENCES :			
an aluminum leaf electroscope.	 Kofler, M. <u>Sitzungsber</u>. <u>Akad</u>. <u>Wiss</u>. <u>Wien</u>, <u>Abt</u>. 2A 1912, <u>121</u>, 2169. 			
	 Kofler, M. <u>Monatsh</u>. 1913, <u>34</u>, 389. 			

	···	1	
COMPONENTS: 1. Radon; 222 86Rn; 14859-67-7		ORIGINAL MEASUREMENTS: Kofler, M.	
2. Water; H ₂ O; 7732-18-5		NOLLEL, P	••
3. Ammonium nitrate; NH,NO ₃ ;			<u>ber. Akad. Wiss. Wien</u> , <u>turwiss. Kl</u> . <u>Abt</u> . <u>2A</u> 1913, 3 - 1479.
VARIABLES:	<u></u>	PREPARED BY	7
T/K: 273.35 - 31	15.55	FREPARED BI	W. Gerrard
Specific Gravity: 1.024	- 1.180		
EXPERIMENTAL VALUES:			
NH ₄ Cl T/K	Gravity Ni	monium trate ol kg ⁻¹ H ₂ C	Ostwald Coefficient D L
273.35		0.0	0.532
288.65 309.95 315.55			0.303 0.176 0.159
273.35 288.35 302.75	1.024	0.807	0.412 0.254 0.177
273.35 288.65 309.95 315.55	1.050	1.72	0.358 0.228 0.146 (0.121?)
273.45 288.95 307.55 308.95	1.090	3.37	0.278 0.182 0.131 0.127
275.75 289.05 309.45	1.180	8.49	0.147 0.113 0.090
291.15	ecific gravit: except for th asured at 290	ne value l	easured at .024 which
The Editor estimated the	NH4NO3 molal	ity from I	CT density tables.
	AUXILIARY	INFORMATION	
METHOD: Measurement of radioacti liquid and gaseous phase by Kofler (1,2), who gave	s. Described	SOURCE AND Not spec	PURITY OF MATERIALS: ified
APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb		ESTIMATED ERROR:	
had a separate tap. The shaken. Radioactivity i an aluminum leaf electro	assembly is s measured by	1. Kofl Sitz Abt. 2. Kofl	: er, M. <u>ungsber. Akad. Wiss. Wien</u> , 2A 1912, <u>121</u> , 2169. er, M. tsh. 1913, <u>34</u> , 389.

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7	Kofler, M.
00	Korrer, M.
2. Water; H ₂ O; 7732-18-5	
3. Copper Sulfate; CuSO ₄ ; 7758-98-7	
	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES :	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.042 - 1.193	
EXPERIMENTAL VALUES:	
T/K Specific Copper	
Gravity Sulfat	
mol kg	⁻¹ H ₂ O L
291.15 - 0.0	
	76 0.194 511 0.157
	0.137
	0.131
1.193 1.3	36 0.075
The solubility in water was interpolat reference (1).	ed from the author's data from
The copper sulfate molalities were cal taken from the International Critical	culated by the Editor from data Tables, Vol. III.
The author reported his solubility val	
(Concentration of Rn in the liquid pha	
We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri	ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa.
at a radon partial pressure of less th was also saturated with air as a carri	an 0.1 kPa at equilibrium. The liquid
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD:	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE:	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified
at a radon partial pressure of less th was also saturated with air as a carri AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified
AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is	an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified
AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	An 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified ESTIMATED ERROR:
AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is	An 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified ESTIMATED ERROR: REFERENCES:
AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	An 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified ESTIMATED ERROR:
AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	An 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified ESTIMATED ERROR: REFERENCES: 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien,

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Silver Nitrate; AgNO ₃ ; 7761-88-8	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES: T/K: 291.15	PREPARED BY: W. Gerrard
Specific Gravity: 1.190	
EXPERIMENTAL VALUES:	
T/K Specific Silve Gravity nitra mol k	
	0.0 0.280 1.43 0.192
The solubility in water was interpola reference (1).	ted from the author's data in
The silver nitrate molality was ca taken from the International Critical	
We have labelled it as an Ostwald coe at a radon partial pressure of less t liquid was also saturated with air as 100 kPa.	
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
APPARATUS/PROCEDURE: The apparatus consisted of two glass	ESTIMATED ERROR:
bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf electroscope.	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> , <u>Abt. 2A</u> 1912, <u>121</u> , 2169.

COMPONENTE .	ODTOTULE NE LONGE ENER
COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² 8n; 14859-67-7 86	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Zinc Sulfate; ZnSO ₄ ; 7732-02-0	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.199-1.346	
EXPERIMENTAL VALUES:	
T/K Specific zinc Gravity sulfate mol kg	
291.15 - 0.0	0.280
1.199 1.3	0 0.092
1.346 2.4	5 0.041
The solubility in water was interpolater for the solubility in water was interpolated reference (1).	ed from the author's data from
The zinc sulfate molalities were calcu taken from the International Critical	
The author reported his solubility val (Concentration of Rn in the liquid pha We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri-	se)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is	
shaken. Radioactivity is measured by	REFERENCES :
an aluminum leaf electroscope.	 Kofler, M. <u>Sitzungsber</u>. <u>Akad</u>. <u>Wiss</u>. <u>Wien</u>, <u>Abt</u>. <u>2A</u> 1912, <u>121</u>, 2169.
	 Kofler, M. <u>Monatsh</u>. 1913, <u>34</u>, 389.
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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7 86	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
<pre>3. Mercury (II) Chloride; HgCl₂; 7487-94-7</pre>	<u>Physik.</u> <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES:	PREPARED BY:
т/к: 291.15	W. Gerrard
Specific Gravity: 1.049	
EXPERIMENTAL VALUES:	
T/K Specific Mercur Gravity Chlori	y (II) Ostwald de Coefficient
291.15 - 0.	0.280
	226 0.250
The solubility in water was interpolat reference (1).	ed from the author's data from
The mercury (II) chloride molality w data taken from the International Crit	
was also saturated with all as a carri	er gas at a pressure of about 100 kPa.
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
APPARATUS / PROCEDURE -	ESTIMATED ERROR:
APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf electroscope.	ESTIMATED ERROR: REFERENCES: 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien,

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; $\frac{222}{86}$ Rn; 14859-67-7	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Lead Nitrate; Pb(NO ₃) ₂ ; 10099-74-8	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.237 - 1.283	
EXPERIMENTAL VALUES:	······
T/K Specific Lead	Ostwald
Gravity nitra	te Coefficient g ⁻¹ H ₂ 0 L
291.15 - 0	.0 0.280
	.889 0.166
	.081 0.143
The solubility in water was interpola reference (1).	ted from the author's data from
The lead nitrate molalities were calcutation to the second	
We have labelled it as an Ostwald coes at a radon partial pressure of less t	lues as an Absorption Coefficient = ase)/(Concentration in the gas phase). fficient. The solubility was measured han 0.1 kPa at equilibrium. The liquid ier gas at a pressure of about 100 kPa.
	TURODU MTOU
	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
	ESTIMATED ERROR:
APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb	
had a separate tap. The assembly is shaken. Radioactivity is measured	
by an aluminum leaf electroscope.	REFERENCES:
	1. Kofler, M. <u>Sitzungsber</u> . <u>Akad</u> . <u>Wiss</u> . <u>Wien</u> , <u>Abt</u> . <u>2A</u> 1912, <u>121</u> , <u>2169</u> .
	 Kofler, M. Monatsh. 1913, <u>34</u>, 389.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² 8Rn; 14859-67-7 86	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Ferrous Sulfate; FeSO ₄ ; 7720-78-7	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.226	
EXPERIMENTAL VALUES:	
T/K Specific Ferrou Gravity Sulfat	
	-1 H ₂ O L
	<u> </u>
291.15 - 0. 1.226 1.	0 0.280 58 0.081
The solubility in water was interpolat	ed from the author's data from
reference (1).	
The ferrous sulfate molality was ca taken from the International Critical	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
The apparatus consisted of two glass	ESTIMATED ERROR:
•	ESTIMATED ERROR:
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	ESTIMATED ERROR:
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is	REFERENCES: 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien,
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> , <u>Abt. 2A</u> 1912, <u>121</u> , 2169.
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured	REFERENCES: 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien,

COMPONENTS :			ORIGINAL MEA	SUREMENTS :
1. Radon; $\frac{222}{86}$ R	n; 14859-6	57-7	Kofler, M.	
2. Water; H ₂ O;				
 Barium Nitr 10022-31-8 				er. <u>Akad. Wiss</u> . <u>Wien</u> , urwiss. <u>Kl. Abt</u> . <u>2A</u> 1913, ~ 1479.
VARIABLES: T/K: Specific Gravit	273.45 - 3 y: 1.006		PREPARED BY:	W. Gerrard
EXPERIMENTAL VALUE	S:		-	
Ba (NO ₃) ₂	т/к	Gravity N	arium itrate ol kg ⁻¹ H ₂ O	Ostwald Coefficient L
	273.45 279.35 286.55 303.45 314.55		0.0	0.530 0.418 0.324 0.202 0.161
	274.75 288.15 300.65	1.006	0.0346	0.452 0.274 0.198
	273.45 279.35 286.55 303.45	1.012	0.0630	0.474 0.368 0.285 0.182
	278.25 286.95 314.55	1.036	0.179	0.366 0.254 0.142
	281.55	1.055	0.271	0.310
	287.75 300.65	1.0624	0.298	0.242 0.177
	*All spe	ecific gravit	ies were mea	asured at
The comments or on the other Ko	291.15 n water so	K. lubility, sal	t molality	and absorption coefficient
			INFORMATION	
METHOD: Measurement of liquid and gase by Kofler (1,2)	ous phase	s. Described	Not sp	PURITY OF MATERIALS: ecified
APPARATUS / PROCEDUR			ESTIMATED EF	RROR:
The apparatus of bulbs connected had a separate shaken. Radioa an aluminum lea	l by a tap tap. The ctivity i	. Each bulb assembly is s measured by	REFERENCES ;	
			Abt.	ngsber. Akad. Wiss. Wien, 2A 1912, <u>121</u> , 2169.
			2. Kofle Monat	r, M. <u>sh</u> . 1913, <u>34</u> , 389.

COMPONENTS :			ORIGINAL MEAS	
	34050	(7 7		
1. Radon; 222 _{Rn} ; 86			Kofler, M.	
2. Water; H ₂ O; 7	732-18-	5		
3. Sodium Chlori	de; NaC	1; 7647-14-5	Sitzungsbe	r. Akad. Wiss. Wien, rwiss. Kl. Abt. 2A 1913,
			122, 1473	
VARIABLES:			PREPARED BY:	
T/K: 27	3.35 -	290.15		W. Gerrard
Specific Gravity:	1.008	- 1.215		
EXPERIMENTAL VALUES:	т/к	Specific* So	odium	Ostwald
NaCl	1/1	Gravity Cl	nloride	Coefficient
		ma	ol kg ⁻¹ H ₂ 0	L
	273.35		0.0	0.532
	273.65			0.526
	278.95			0.423 0.403
	282.95			0.366
	284.65			0.345 0.280
	298.35			0.229
	305.35			0.194 0.140
	291.15	1.008	0.220	0.239
	273.65	1.009	0.245	0.417
	291.15	1.021	0.542	0.202
	291.15	1.039	1.00	0.163
	291.15	1.0392	1.01	0.163
	273.95 279.65	1.071	1.87	0.220 0.176
	285.95			0.154
	291.15	1.096	2.59	0.096
		ecific gravity K except the		
			 INFORMATION	
METHOD		AUXILIARI		URITY OF MATERIALS:
METHOD:	<u>.</u>			
Measurement of ra	idioacti is phase	vity in the s. Described		ecified
by Kofler (1,2),				
				· · · · · · · · · · · · · · · · · · ·
APPARATUS / PROCEDURE :		······	ESTIMATED ER	ROR:
The apparatus cor	nsisted	of two glass	1	
bulbs connected b	by a tap	. Each bulb		
had a separate ta shaken. Radioact				
an aluminum leaf			REFERENCES:	~ M
			1. Kofler Sitzur	ngsber. Akad. Wiss. Wien,
The comments on v	water so	lubility,	Abt.	<u>2A 1912, 121</u> , 2169.
salt molality, and ficients on the contents of the second	nd abson other Ko	fler data	2. Kofler	
sheets apply.				<u>sh</u> . 1913, <u>34</u> , 389.
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COMPONENTS: 222 1. Radon; 86Rn; 14859-67-7	Kofler,	EASUREMENTS:	
2. Water; H ₂ O; 7732-18-5		,	
3. Tetrapotassium, (OC-6-11)-hexa-			
kis (cyano-C)-Ferrate (4-)			
(Potassium Ferrocyanide),	Physik.	<u>z</u> . 1908, <u>9</u> , 6-8.	
$K_{4}Fe(CN)_{6}; 13943-58-3$			
VARIABLES:	PREPARED B	3Y:	
T/K: 291.15		W. Gerrard	
Specific Gravity: 1.107			
EXPERIMENTAL VALUES:	<u> </u>	······	
	sium O	Dstwald	
		Coefficient	
mol	кg ⁻¹ н ₂ 0	L	
291.15 - 0. 1.107 0.	90	0.280 0.102	
The solubility in water was interpo reference (1).	ated from	the author's data from	
The potassium ferrocyanide molality			
data taken from the International C	fitical Tab	oles, Vol. 111.	
The author reported his solubility			
(Concentration of Rn in the liquid) We have labelled it as an Ostwald co	hase)/(Con	centration in the gas phase	:).
We have tabelled it as an Ostwald C		. The solubility was measur	6.0
		Pa at equilibrium. The	ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		eđ
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air .	than 0.1 k		ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa.	than 0.1 k s a carrie	er gas at a pressure of abou	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIA	than 0.1 k is a carrie Y INFORMATION	er gas at a pressure of abou	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN	than 0.1 k as a carrie Y INFORMATION SOURCE AND	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS:	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS: specified	ed
at a radon partial pressure of less liquid was also saturated with air 100 kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not	er gas at a pressure of abou NN D PURITY OF MATERIALS: specified	ed
at a radon partial pressure of less liquid was also saturated with air loo kPa. AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not ESTIMATED	er gas at a pressure of abou NN D PURITY OF MATERIALS: specified	ed
APPARATUS/PROCEDURE: The apparatus consisted of two glas	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not ESTIMATED	er gas at a pressure of abou NN D PURITY OF MATERIALS: specified	ed
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly in	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not ESTIMATED	N D PURITY OF MATERIALS: specified ERROR:	ed
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly i shaken. Radioactivity is measured	than 0.1 k as a carrie Y INFORMATION SOURCE AND Not ed ESTIMATED	er gas at a pressure of abou NN D PURITY OF MATERIALS: specified ERROR: S:	ed
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly in	than 0.1 k a carrie Y INFORMATION SOURCE AND Not ESTIMATED REFERENCES 1. Kof Sit	PROR: S: Fler, M. zungsber. Akad. Wiss. Wien,	ed .
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly i shaken. Radioactivity is measured	than 0.1 k a carrie Y INFORMATION SOURCE AND Not ESTIMATED REFERENCES 1. Kof Sit	PROR: S: Eler, M.	ed .
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly i shaken. Radioactivity is measured	Than 0.1 k a carrie Y INFORMATION SOURCE AND Not ESTIMATED REFERENCES 1. Kof Sit Abt	N D PURITY OF MATERIALS: specified ERROR: S: Eler, M. <u>zungsber. Akad. Wiss. Wien</u> , <u>5:</u> 2A 1912, <u>121</u> , 2169.	ed t
AUXILIAN METHOD: Measurement of radioactivity in the liquid and gaseous phases. Describ by Kofler (1,2), who gave a diagram APPARATUS/PROCEDURE: The apparatus consisted of two glas bulbs connected by a tap. Each bull had a separate tap. The assembly i shaken. Radioactivity is measured	Y INFORMATION SOURCE AND Not ESTIMATED REFERENCES 1. Kof Sit Abt 2. Kof	PROR: S: Fler, M. zungsber. Akad. Wiss. Wien,	ed .

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
 Potassium Permanganate; KMnO₄; 7722-64-7 	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.038	
EXPERIMENTAL VALUES:	
T/K Specific Potass	
	ganate Coefficient ⁻¹ H ₂ O L
291.15 - 0	.0 0.280
1.038 0	.380 0.194
The solubility in water was interpola reference (1).	ted from the author's data from
The potassium permanganate molality data taken from the International Cri	was calculated by the Editor from tical Tables, Vol. III.
We have labelled it as an Ostwald coe at a radon partial pressure of less t	lues as an Absorption Coefficient = ase)/(Concentration in the gas phase). fficient. The solubility was measured han 0.1 kPa at equilibrium. The liquid ier gas at a pressure of about 100 kPa.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the	
liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
The apparatus consisted of two glass bulbs connected by a tap. Each bulb	
had a separate tap. The assembly is	
shaken. Radioactivity is measured by an aluminum leaf electroscope.	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> , <u>Abt. 2A</u> 1912, <u>121</u> , 2169.
	 Kofler, M. <u>Monatsh</u>. 1913, <u>34</u>, 389.

COMPONENTS:			ORIGI	NAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn;			Kof	ler, M.	
2. Water; H ₂ O; 7	732-18-5				
3. Potassium Chl	oride; KCl;	7447-40-7	Phy	<u>sik</u> . <u>Z</u> . 1908, <u>9</u> , 6 - 8.	
VARIABLES:	<u></u>		PREPA	RED BY:	
т/к: 29				W. Gerrard	
Specific Gravity	: 1.000 - 1.	175			
EXPERIMENTAL VALUES:					
Т/К	Specific	Potassiur	n	Ostwald	
	Gravity	Chloride		Coefficient	
		mol kg ⁻¹	^H 2 ^O	L	
291.1	5 1.000	0.0		0.280	
	1.028	0.641		0.187	
	1.0449 1.069	1.032 1.62		0.163 0.133	
	1.100	2.42		0.114	
	1.175	4.63		0.061	
The author report = (Concentration	ted his solu of Rn in th	bility val e liquid p	ues hase	es, Vol. III. as an Absorption Coeffici /(Concentration in the g	as phase)
The author report = (Concentration We have labelled at a radon partic	ted his solu of Rn in the it as an Os al pressure o	bility val e liquid p twald coef of less th	ues bhase ficio an 0	as an Absorption Coeffici	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partic	ted his solu of Rn in the it as an Os al pressure o	bility val e liquid p twald coef of less th	ues bhase ficio an 0 .er ga	as an Absorption Coeffici /(Concentration in the g ent. The solubility was m .1 kPa at equilibrium. Th as at a pressure of about	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate	ted his solu of Rn in the it as an Os al pressure o	bility val e liquid p twald coef of less th as a carri	ues a hase ficio an 0 .er ga INFORM	As an Absorption Coefficient /(Concentration in the gent. The solubility was multiplicated by the solubility was multiplicated by the solution of a solutio	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD:	ted his solu of Rn in th it as an Os al pressure o ed with air a	bility val e liquid p twald coef of less th as a carri AUXILIARY	ues hase fici an 0 er ga INFORM	As an Absorption Coefficient (Concentration in the gent. The solubility was much kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS:	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate	ted his solut of Rn in the it as an Os al pressure of ed with air of adioactivity us phases. D	bility val e liquid p twald coef of less th as a carri AUXILIARY AUXILIARY in the escribed	ues hase fici an 0 er ga INFORM	As an Absorption Coefficient /(Concentration in the gent. The solubility was multiplicated by the solubility was multiplicated by the solution of a solutio	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra liquid and gaseo by Kofler (1,2),	ted his solut of Rn in the it as an Os al pressure of ed with air of adioactivity us phases. D	bility val e liquid p twald coef of less th as a carri AUXILIARY AUXILIARY in the escribed	ines ficio an 0 er ga INFORM SOURC Not	As an Absorption Coefficient (Concentration in the gent. The solubility was much kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS:	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra liquid and gaseo	ted his solut of Rn in the it as an Os al pressure of ed with air of adioactivity us phases. D	bility val e liquid p twald coef of less th as a carri AUXILIARY AUXILIARY in the escribed	ines ficio an 0 er ga INFORM SOURC Not	As an Absorption Coefficient (Concentration in the gent. The solubility was much l kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS: specified	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con	ted his solu of Rn in the it as an Os al pressure of ed with air a adioactivity us phases. Do who gave a who gave a	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram.	ines ficio an 0 er ga INFORM SOURC Not	As an Absorption Coefficient (Concentration in the gent. The solubility was much l kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS: specified	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con- bulbs connected	ted his solud of Rn in the it as an Os al pressure of ed with air adioactivity us phases. Do who gave a who gave a by a tap. Ea	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb	ines ficio an 0 er ga INFORM SOURC Not	As an Absorption Coefficient (Concentration in the gent. The solubility was much l kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS: specified	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con- bulbs connected 1 had a separate ta	his solut of Rn in the it as an Os al pressure of ed with air a adioactivity us phases. Do who gave a who gave a ap. The asset	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb mbly is	ues ficio an 0 er ga INFORM SOURC NOT	As an Absorption Coefficient (Concentration in the gent. The solubility was much l kPa at equilibrium. The as at a pressure of about MATION E AND PURITY OF MATERIALS: specified	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con- bulbs connected	hsisted of tr by a tap. Ea ivity is mea	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb mbly is sured by	Lues hase ficio an 0 er ga INFORN SOURC Not ESTIM REFER	As an Absorption Coefficient (Concentration in the gent. The solubility was much as at equilibrium. The las at a pressure of about MATION E AND PURITY OF MATERIALS: : specified ATED ERROR: EENCES:	ent as phase) easured e liquid
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con bulbs connected 1 had a separate ta shaken. Radioact	hsisted of tr by a tap. Ea ivity is mea	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb mbly is sured by	er ga INFORN SOURC Not REFER	As an Absorption Coefficient (Concentration in the gent. The solubility was multiplicated) (Arrow the solution of the soluti	ent as phase) easured e liquid 100 kPa.
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con bulbs connected 1 had a separate ta shaken. Radioact	hsisted of tr by a tap. Ea ivity is mea	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb mbly is sured by	er ga INFORN SOURC Not REFER	As an Absorption Coefficient (Concentration in the gent. The solubility was multiplication in the solubility was multiplicated and the solution of about the solution of about the solution of the solution o	ent as phase) easured e liquid 100 kPa.
The author report = (Concentration We have labelled at a radon partia was also saturate METHOD: Measurement of ra- liquid and gaseon by Kofler (1,2), APPARATUS/PROCEDURE: The apparatus con bulbs connected 1 had a separate ta shaken. Radioact	hsisted of tr by a tap. Ea ivity is mea	bility val e liquid p twald coef of less th as a carri AUXILIARY in the escribed diagram. wo glass ch bulb mbly is sured by	Lues hase ficio an 0 er ga INFORN SOURC Not ESTIM REFER 1.	As an Absorption Coefficient (Concentration in the gent. The solubility was multiplicated) (Arrow the solution of the soluti	ent as phase) easured e liquid 100 kPa.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7 86	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Ethanol; C ₂ H ₅ OH; 64-17-5	
	Physik. Z. 1908, 9, 6-8.
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 0.800 - 0.977	
EXPERIMENTAL VALUES:	
T/K Specific Ethan	ol Ostwald
Gravity Mol F X	raction Coefficient
291.15 - 0. 0.977 0.	0 0.280 061 0.300
0.944 0.	182 0.436
	268 0.765 403 1.301
	928 5.606
The solubility in water was interpolat reference (1).	ed trom the author' data from
The ethanol mole fractions were calcul the International Critical Tables, Vol	ated by the Editor from data taken from . III.
	Normalian Graffiniant
Upe author reported his solubility val-	
The author reported his solubility val = (Concentration of Rn in the liquid p	hase)/(Concentration in the gas phase).
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef	hase)/(Concentration in the gas phase). ficient. The solubility was measured
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the was also saturated with air as a carrie AUXILIARY METHOD: Measurement of radioactivity in	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- AUXILIARY METHOD: Measurement of radioactivity in the liquid and gaseous phases.	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less the was also saturated with air as a carrie AUXILIARY METHOD: Measurement of radioactivity in	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Must also saturated with air as a carri-	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS;
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Must also saturated with air as a carri-	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS:
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= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Must also saturated with air as a carri-	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS:
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Must also saturated with air as a carri-	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS:
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= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Methon: Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap.	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Muse a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Muse a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified. ESTIMATED ERROR: REFERENCES: 1. Kofler, M.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Muse a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is	<pre>hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified. ESTIMATED ERROR: REFERENCES: 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien,</pre>
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Muse a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified. ESTIMATED ERROR: REFERENCES: 1. Kofler, M.
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Muse a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf	<pre>hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified. ESTIMATED ERROR: REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u>, <u>Abt. 2A</u> 1912, <u>121</u>, 2169. 2. Kofler, M.</pre>
= (Concentration of Rn in the liquid pl We have labelled it as an Ostwald coef at a radon partial pressure of less th was also saturated with air as a carri- Mass also saturated with air as a carri- Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram. APPARATUS/PROCEDURE: The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf	hase)/(Concentration in the gas phase). ficient. The solubility was measured an 0.1 kPa at equilibrium. The liquid er gas at a pressure of about 100 kPa. INFORMATION SOURCE AND PURITY OF MATERIALS: Not specified. ESTIMATED ERROR: REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> , <u>Abt. 2A</u> 1912, <u>121</u> , 2169.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7 86	Kofler, M.
2. Water; H ₂ O; 7732-18-5	
3. Sucrose; C ₁₂ H ₂₂ O ₁₁ ; 57-50-1	<u>Physik</u> . <u>Z</u> . 1908, <u>9</u> , 6-8.
VARIABLES:	PREPARED BY:
T/K: 291.15	W. Gerrard
Specific Gravity: 1.082 - 1.214	
EXPERIMENTAL VALUES:	
T/K Specific Sucro Gravity mol k	se Ostwald g ⁻¹ H ₂ O L
291.15 - 0	.0 0.280
1.082 0	.744 0.188
1.214 2	.61 0.114
The solubility in water was interpolar reference (1).	ted from the author's data from
The sucrose molalities were calculated the International Critical Tables, Vo	d by the Editor from data taken from 1. II, for 293.15 K.
sured at a radon partial pressure of liquid was also saturated with air as 100 kPa.	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.	Not specified
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	LUTITIED ERROR.
The apparatus consisted of two glass	
bulbs connected by a tap. Each bulb	
had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf electroscope.	REFERENCES: 1. Kofler, M. <u>Sitzungsber</u> . <u>Akad</u> . <u>Wiss</u> . <u>Wien</u> , <u>Abt</u> . <u>2A</u> 1912, <u>121</u> , 2169.
	2. Kofler, M. <u>Monatsh</u> . 1913, <u>34</u> , 389.

1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7	Kofler, M.	
	J	
2. Water; H ₂ O; 7732-18-5	(
3. Urea; (NH ₂) ₂ CO; 57-13-6	<u>Sitzungsber</u> . <u>Akad</u> . <u>Wiss</u> . <u>Wien</u> , <u>MathNaturwiss</u> . <u>Kl</u> . <u>Abt</u> . <u>2A</u> 1913, <u>122</u> , 1473 - 1479.	
VARIABLES: T/K: 273.95 - 303.65 Specific Gravity: 1.004 - 1.070	PREPARED BY:	W. Gerrard
specific Gravity. 1.004 = 1.070		
	теа 01 kg ⁻¹ H ₂ O	Ostwald Coefficient L
273.95 - 278.65 286.75 298.75 306.65	0.0	0.519 0.429 0.322 0.227 0.188
289.55 1.004 307.15	0.336	0.270 0.179
276.75 1.012 288.95 306.65	0.862	0.412 0.273 0.181
273.95 1.016 288.35 305.35	1,125	0.439 0.273 0.187
273.95 1.029 278.65 286.75 298.75 306.65	2.095	0.418 0.354 0.278 0.210 0.174
273.75 1.070 287.95 303.65	5.850	0.370 0.255 0.187
*All of the specific at 291.15 K except was measured at 290	the value l.	vere measured 016 which
AUXILIARY	INFORMATION	
ME THOD:	SOURCE AND PL	URITY OF MATERIALS:
Measurement of radioactivity in the liquid and gaseous phases. Described by Kofler (1,2), who gave a diagram.		becified
	DATA CLASS:	<u></u>
APPARATUS / PROCEDURE :	ESTIMATED ERI	ROR:
The apparatus consisted of two glass bulbs connected by a tap. Each bulb had a separate tap. The assembly is shaken. Radioactivity is measured by an aluminum leaf electroscope. The comments on water solubility, molality, and absorption coefficient	l. Kofler Sitzur	r, M. <u>ngsber. Akad. Wiss. Wien</u> , 2A 1912, <u>121</u> , 2169.

COMPONENTS :	EVALUATOR:
l. Radon; ²²² Rn; 14859-67-7 86 2. Non-aqueous Liquids	William Gerrard Department of Chemistry The Polytechnic of North London Holloway, London N7 8DB U. K.
	May 1977

CRITICAL EVALUATION:

PREAMBLE

The determination of the solubility of radon in liquids is based on a technique so different from those used for other gases that a special explanation is required. In the gaseous phase, the concentration of radon is absolutely small, the partial pressure of radon being less than 0.1 kPa at equilibrium. Furthermore, it is present in a carrier gas (nitrogen or air), the initial pressure of the carrier gas being about 100 kPa. The liquid is therefore saturated with the carrier gas at the equilibrium partial pressure of that gas. The concentration of radon in the gaseous phase, and that in the liquid phase are separately determined by the measurement of gamma-ray emission by means of an electroscope, a condenser, or a sodium iodide scintillation counter. Up to 1910, the electroscope technique was primitive, and apparently not reliable. In 1911, Boyle (1) described the procedure of holding the vessel containing one of the phases near enough to the electroscope to cause an effective ionization which could be compared with that produced by a standard amount of radium. Ramstedt (2) put the vessel into a condenser. Nussbaum and Hursh (3) however, used a sodium iodide scintillation counter.

The primary results were presented as the equivalent of a ratio of concentrations: concentration in the liquid phase/concentration in the gaseous phase; and this ratio was called the "absorption coefficient." It was actually stated, or tacitly assumed, that Henry's law was "obeyed," and that this ratio was independent of pressure. The ratio of concentrations was assumed to be equal to the volume of radon absorbed by an equal volume of the liquid phase, i.e. in effect the Ostwald absorption coefficient; but with the implication that the partial pressure of radon was 101.325 kPa. Nussbaum and Hursh (3), for example, used nitrogen containing a concentration of radon equivalent to $l\mu c$ per dm³ of nitrogen. The radioactivity was assayed by counting the ganma-rays emitted by the short-lived decay products in radioactive equilibrium with radon. The ratio: (net counts per min./cm³ of the original liquid)/(net counts per min./cm³ of gas) was called the Ostwald solubility coefficient, and given the symbol α' . It must be emphasized that this ratio is pinned to a very small partial pressure of radon.

For the comparison of solubilities on a molecular basis, the absorption coefficients in their primary form may not be used; they must be converted into mole ratios and mole fractions. The main purpose in doing this conversion is to check the primary data by means of the reference line procedure described by Gerrard (4), and to make easier the comparison of radon solubility values with the solubility values of other gases. The following statements indicate the basis of the conversion.

1. The Ostwald coefficient is independent of pressure. In principle this is not valid; although deviations may be neglected in certain specific examples, they may not be in others.

2. The gram-mole volume of radon is taken to be 22,290 cm³ at 273.15/K and a pressure, p_{Rn} , of 101.325 kPa. The gram-mole volume for other temperatures is given by 22,290 x T/273.15

3. The density, $\rho_{\rm S},$ of the liquid, S, is that for the temperature of observation of the primary data.

4. The molecular weight of the liquid, S, is taken to be the simplest formula weight, e.g. C_2H_5OH (46.07) and CH_3CO_2H (60.05).

5. The mole ratio is given by: (absorption coefficient/gram-mole volume) x (M_S/ρ_S) where M_S is the molecular weight, and ρ_S is the density of S. The mole fraction X_{gas} obtained by (mole ratio)/(1 + mole ratio).

COMPONENTS:	EVALUATOR:
 Radon; ²²²₈₆Rn; 14859-67-7 Non-aqueous Liquids 	William Gerrard Department of Chemistry The Polytechnic of North London Holloway, London N7 8DB U. K.
	May 1977
CRITICAL EVALUATION: EVALUA	ATION
There are two independent operations of the reported of the reliability of the reported of	
(1) The determination of concentration p_{Rn} , of radon less than 0.1 kPa, and pressure of about 100 kPa.	on of radon by the measurement of equilibrium at a partial pressure, with carrier gas, initially at a
(2) The invocation of Henry's Law is tion ratio for conditions under (1) a deemed independent of pressure, and th 101.325 kPa.	a basis for accepting the concentra- s equal to the absorption coefficient herefore the same value for p_{Rn} =
very small p_{Rn} values is a matter of a	sed as absorption coefficients for the assessing the accuracy of the measure-
ment of radioactivity. The measurement when this is specifically carried out	. The pressure, p _{Rn} , is not stated,
and the assumption that the absorption sure entails a decision identified as used his own reference line procedure	operation (2). The evaluator has
The assessment of reliability of the ficient (for the very small p_{Rn}) cannot resulting from the assumption that the $p_{Rn} = 101.325$ kPa. In the evaluation	ot lead to the same grading as that e primary coefficient is the same at , the assessment is based on the
primary absorption coefficients for t	
Nevertheless, the calculated mole fractional (4) has been been been been been been been bee	
line procedure of Gerrard (4), has be of the primary data. It must be emph- measurements of radioactivity was car	asised that none of the primary
All the primarily observed absorption (2), and of Nussbaum and Hursh (3) are (5) are much less reliable. Lurie's and Traubenberg's (7) values are too	e acceptable. The values by Hofbauer (6) values tend to be much too large,

The publications (8, 9, 10, 11) have been cited as sources of data; but they do not contain original data.

The values given by Gabrilova (12) for petroleum oils are not admissible; because the systems were not in equilibrium. Onuma (13) reviewed the extraction of radon by organic solvents. Krestov and Nedel'ko (14) estimated solubility data for radon in 51 organic liquids from the basis of data relating to the other noble gases. They also gave estimates for solutions of the dihalogenobenzenes in xylene.

COMPONENTS: **EVALUATOR:** ²²²₈₆Rn; 14859-67-7 Radon; 1. William Gerrard Department of Chemistry 2. Non-aqueous Liquids The Polytechnic of North London Holloway, London N7 8DB U. K. CRITICAL EVALUATION: REFERENCES Boyle, R.W. Phil. Mag. 1911, 22, 840. 1. 2. Ramstedt, E. Le Radium 1911, 8, 253. з. Nussbaum, E.; Hursh, J.B. J. Phys. Chem. 1958, 62, 81. 4. Gerrard, W. Solubility of Gases and Liquids - A Graphic Approach, Plenum, New York, 1976. 5. Hofbauer, G. Sitzungsber. Akad. Wiss. Wien, Abt. 2A, 1914, 123 2001. Lurie, A. Thesis, University of Grenoble, 1910. б. 7. Traubenberg, H.F.R. Phys. Z. 1904, 5, 130. 8. Schulze, A. Z. Phys. Chem., 1920, 95, 257. 9. Swinne, R. Z. Phys. Chem., 1913, 84, 348. 10. Semenchenko, V.K. and Shakhparanov, M.I. Zh. Fiz. Khim., 1948, 22, 243. 11. Szeparowicz, M. Sitzungsber. Akad. Wiss. Wien Abt IIa, 1920, 129, 437. 12. Gavrilova, E.N. Trudy Vses. Nauch. Issles. Inst. Metro, 1939, 26, 39. 13. Onum, N. Bunseki Kagaku, 1967, 16, 274. Krestov, G.A. and Nedel'ko, B.E. Tr. Ivanov. Khim. Tekhnol. Inst., 14. 1972, <u>32</u>, 102.

COMPONENTS: 1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7	ORIGINAL MEASUREMENTS: Ramstedt, E.
	Ramsteut, E.
2. Hexane; C ₆ H ₁₄ ; 110-54-3	<u>Le Radium 1911, 8, 253 - 256.</u>
	<u>no nauran</u> 1911, <u>0</u> , 200
VARIABLES:	DEDADED DV.
T/K: 255.15 - 291.15	PREPARED BY: W. Gerrard
	May 1977
EXPERIMENTAL VALUES:	tion Ostwald
	2 Coefficient
255.15 17.	4 35.2
273.15 11. 291.15 8.	
291.15 8	<u> </u>
The Ostwald coefficient was measured	at a radon partial processo of loss
than 0.1 kPa at equilibrium. The rado nitrogen) at an initial pressure of a	n was present in a carrier gas (air or
	ulated by the compiler. It was assumed
that the Ostwald coefficient was indep gram-mole volume of radon is 22,290 c	pendent of pressure and that the n ³ at 273.15 K and 101.325 kPa.
Smoothed Data: $\Delta G^{0}/J \mod^{-1} = -RT \ln 2$	
Std. Dev. $\Delta G = 6$, Coe	
$\Delta H^0 / J \text{ mol}^{-1} = -12,662$, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -64.151$
T/K Mol Fra	$\Delta G^{\circ}/J \text{ mol}^{-1}$
<u> </u>	<u>102</u>
258.15 16. 268.15 13.	-,
278.15 10. 288.15 8.	6 5,181.5
288.15 8. 298.15 7.	
The smoothed data fit was added by the	e Volume Editor.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the	1. Radon.
liquid and in the gaseous phase.	2. Hexane. Dried and distilled,
	b.p. 66 - 70 °C.
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	
Two tube connected by a wide tap. To determine concentration of radon,	
each tube is placed in a condenser.	
- -	REFERENCES :

COMPONENTS: 222 1. Radon; 222 86 ^{Rn} ; 14859-67-7	ORIGINAL MEASUREMENTS: Ramstedt, E.
2. Cyclohexane; C ₆ H ₁₂ ; 110-82-7	Le <u>Radium</u> 1911, <u>8</u> , 253-256.
VARIABLES:	
T/K: 291.15	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES:	
T/K Mol Fra X ₁ ×	
291.15 7.5	19 18.04
than 0.1 kPa at equilibrium. The rade or nitrogen) at an initial pressure of The mole fraction solubility was calcu assumed that the Ostwald coefficient w the gram-mole volume of radon is 22,29	about 101 kPa. Nated by the compiler. It was as independent of pressure and that
AUXILIARY	INFORMATION
	INFORMATION
METHOD: Measurement of radioactivity in	INFORMATION SOURCE AND PURITY OF MATERIALS; 1. Radon.
METHOD:	SOURCE AND PURITY OF MATERIALS:
METHOD: Measurement of radioactivity in	SOURCE AND PURITY OF MATERIALS: 1. Radon. 2. Cyclohexane. Dried and dis-
METHOD: Measurement of radioactivity in the liquid and in the gaseous phase.	SOURCE AND PURITY OF MATERIALS: 1. Radon. 2. Cyclohexane. Dried and dis-
METHOD: Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon. 2. Cyclohexane. Dried and dis- tilled, b.p. 80°C.
METHOD: Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap.	SOURCE AND PURITY OF MATERIALS; 1. Radon. 2. Cyclohexane. Dried and dis- tilled, b.p. 80°C.
METHOD: Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon. 2. Cyclohexane. Dried and dis- tilled, b.p. 80°C. ESTIMATED ERROR:

ORIGINAL MEASUREMENTS: COMPONENTS : Radon; ²²²₈₆Rn; 14859-67-7 Ramstedt, E. 1. 2. Benzene; C₆H₆; 71-43-2 Le <u>Radium</u> 1911, <u>8</u>, 253-256. VARIABLES: T/K: PREPARED BY: 276.15 - 291.15 W. Gerrard **EXPERIMENTAL VALUES:** T/K Mol Fraction Ostwald $x_{1} \times 10^{2}$ Coefficient L 6.16 16.54 276.15 291.15 4.57 12.82 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. Smoothed data: $\Delta G^{\circ}/J \text{ mol}^{-1} = -RT \ln X_{1} = -13,306 + 71.355 T$ $\Delta H^{O}/J \text{ mol}^{-1} = -13,306, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -71.355$ Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ T/K $x_{1} \times 10^{2}$ 5.91 278.15 6,541.9 5.34 6,898.6 283.15 7,255.4 4.84 288.15 293.15 4.40 7,612.2 298.15 4.02 7,968.9 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: Measurement of radioactivity in 1. Radon. the liquid and in the gaseous phase. 2. Benzene. Dried and distilled. ESTIMATED ERROR: **APPARATUS / PROCEDURE :** Two tubes connected by a wide tap. To determine concentration of radon, each tube is placed in a condenser. **REFERENCES:**

COMPONENTS :	222	EVALUATOR:
1. Radon-222;	²²² Rn; 14859-67-7	William Gerrard
		Department of Chemistry The Polytechnic of North London
	ne (Toluene); C ₇ H ₈ ;	Holloway, London N7 8DB
108-88-3		U.K.
		May 1977
CRITICAL EVALUATION	N:	
tories. Hofman	<pre>(1) reports radon so 3.15 K, Boyle (3) at</pre>	lbenzene is reported by four labora- lubilities at 194.15 and 293.15 K, 287.15 K and Ramstedt (4) at 255.15,
coefficient at the same value 101.325 kPa rad	194.15 K and an approp at 101.325 kPa the mo on pressure. However s the mole fraction se	be used with caution. If the Ostwald ximate radon pressure of 0.1 kPa has le fraction solubility is 0.258 at , the normal boiling point of radon is olubility must, in effect, be unity
The Hofman and appear to be to		fficients at 293.15 K agree well but
but they are cl. regression of a cent higher that	assed as tentative. Sibbs energy equation	mstedt are probably the best available, The Ramstedt data, smoothed by a linear n linear in temperature, are 3.3 per 287.15 K and about 8 per cent higher at 293.15 K.
transfer of one		namic properties of solution for the he gas at 101.325 kPa to the hypo- are
∆G ^O /J ı	$mol^{-1} = -RT \ln x_1 = -$	12,673 + 67.505 T
	ev. $\Delta G^{O} \approx 2.8$, Coef.	
	$mol^{-1} = -12,673, \Delta S^{0}/2$	
		olubility and Gibbs energy values as a he Ramstedt data sheet, and below.
REFERENCES		
1. Hofman, R.	Phys. Z. 1905, 6, 33	9.
2. Lurie, A.	Thesis 1910, Universi	ty of Grenoble.
3. Boyle, R. W	. <u>Phil</u> . <u>Mag</u> . 1911, <u>2</u>	<u>2</u> , 840.
4. Ramstedt, E	. <u>Le Radium</u> 1911, <u>8</u> ,	253.
fracti	on solubility of rado	in methylbenzene. The tentative mole n at a partial pressure of 101.325 kPa gy change as a function of temperature.
	T/K Mol Fracti X ₁ x 10 ²	
	258.15 10.92	4,752.5
	263.15 9.76	5,090.0
	268.15 8.76	5,427.5
	273.15 7.90	5,765.1
		6,102.6
	283.15 6.49 288.15 5.91	6,440.1 6.777.6
	298.15 4.95	7,453.6
	288.15 5.91 293.15 5.40	6,777.6 7,116.1

COMPONENTS :		ORIGINAL MEASUREMENTS:
L. Radon-222; ²²² Rn; 14859-	67-7	Hofmann, R.
2. Methylbenzene (Toluene);		
	/ 8	Phys. Z. 1905, <u>6</u> , 339-340.
/ARIABLES: T/K: 194.15 - 293	1.15	PREPARED BY: W. Gerrard
1,111 1,111 1,111 1,111		
EXPERIMENTAL VALUES:		
AT ENTREMINE VALUES.	T/K	Ostwald Coefficient
		L
	194.15	66.69
	293.15	11.79
	AUXILIARY	' INFORMATION
ME THOD :	AUXILIARY	SOURCE AND PURITY OF MATERIALS;
METHOD: Determination of concentrat: radon in the gas and liquid by means of radioactivity.	ion of	
Determination of concentrat: radon in the gas and liquid	ion of	SOURCE AND PURITY OF MATERIALS: No specific information.
Determination of concentrat: radon in the gas and liquid by means of radioactivity.	ion of phases tainers	SOURCE AND PURITY OF MATERIALS: No specific information.
Determination of concentrat: radon in the gas and liquid by means of radioactivity. APPARATUS/PROCEDURE: Electroscope, and glass con	ion of phases tainers	SOURCE AND PURITY OF MATERIALS: No specific information. ESTIMATED ERROR: Of doubtful accuracy because of the primitive electroscope

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² Rn; 14859-67-7	Lurie, A. Thesis
	University of Grenoble, 1910
2. Methylbenzene (Toluene); C ₇ H ₈ ; 108-88-3	Microfilm available.
108-88-3	See also Tables annuelles de con-
	stantes et donnees numeriques de
	chemie, de physique et de technologie
	1913 (for 1911), <u>2</u> , 401.
VARIABLES:	PREPARED BY:
T/K: 293.15	W. Gerrard
1/1. 255.15	
EXPERIMENTAL VALUES: T/K MOl Frac	tion Ostwald
X ₁ × 1	
	<u> </u>
293.15 4.97	11.76
The author reported a coefficient of a	bsorption, a, which appears to have
the same meaning as the ratio of conce	ntrations: concentration of radon
in the liquid/concentration of radon i	n the gas. The coefficient of
absorption has been labelled as the Os	twald coefficient.
The coefficient of chaparation was more	und of a moder remtial processo of
The coefficient of absorption was meas less then 0.1 kPa at equilibrium. The	
(air or nitrogen) at an initial pressu	
· · · · · · · · · · · · · · · · · · ·	
The mole fraction solubility at 101.32	
It was assumed that the Ostwald coeffi	cient was independent of pressure
and that the gram-mole volume of radon	is 22,290 cm ³ at 273.15 K and
101.325 kPa.	
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	
· , ··································	SOURCE AND PURITY OF MATERIALS:
The concentration of radon in the	SOURCE AND PURITY OF MATERIALS:
	SOURCE AND PURITY OF MATERIALS:
gas and liquid phases determined	1. Radon.
by measurements of radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was	1. Radon.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene).
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified.
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified. ESTIMATED ERROR:
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>1. Radon. 2. Methylbenzene (Toluene). Purity of liquid not specified. ESTIMATED ERROR:</pre>
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified. ESTIMATED ERROR:
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified. ESTIMATED ERROR:
by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 Radon. Methylbenzene (Toluene). Purity of liquid not specified. ESTIMATED ERROR:

222 14050 55 7	ORIGINAL MEASUREMENTS:
1. Radon-222; 222 _{Rn} ; 14859-67-7 86	Boyle, R.W.
<pre>2. Methylbenzene (Toluene); C7^H8; 108-88-3</pre>	<u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840-854.
ARIABLES: T/K: 287.15	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES:	
$\frac{x_1 \times x_2}{x_1}$	
287.15 5.8	13.7
is emanation in volume V ₁ of liquid, gas. The partial pressure of radon a also saturated with carrier gas (air pressure, originally about 101 kPa. The mole fraction solubility at 101.3 compiler. It was assumed that the Os	s less than 0.1 kPa. The liquid is or another gas) at the prevailing
411VTT T 4 DV	
AUXILIARI	INFORMATION
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222 2. Methylbenzene (Toluene).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222 2. Methylbenzene (Toluene).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222 2. Methylbenzene (Toluene). ESTIMATED ERROR: $\delta T/K = 0.2$ $\delta L/L = 0.03$

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7	Ramstedt, E.
2. Methylbenzene (Toluene); C ₇ H ₈ ; 108-88-3	<u>Le Radium</u> 1911, <u>8</u> , 253-256.
VARIABLES:	PREPARED BY:
т/к: 255.15 - 291.15,	W. Gerrard
EXPERIMENTAL VALUES: T/K MOL Frac	$\begin{array}{ccc} & & \\ \text{Stion} & & \\ \text{Ostwald} \\ \text{Coefficient} \\ & & \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline & & \\ \hline & & \\ & & \\ \hline \\ \hline$
x ₁ x 1	
255.15 11.7	27.0
2/3+13 /+3	× × × × × × × × × × × × × × × × × × ×
The Ostwald coefficient was measured a	59 13.24
than 0.1 kPa at equilibrium. The rade	on was present in a carrier gas (air or
nitrogen) at an initial pressure of all	bout 101 kPa.
The mole fraction solubility was calcuthat the Ostwald coefficient was independent mole volume of radon is 22,290 cm ³ at	lated by the compiler. It was assumed
Smoothed data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln M$	
Std. Dev. $\Delta G = 2.9$, Co	
$\Delta H^{O}/J \text{ mol}^{-1} = -12,673$	$\Delta s^{\circ}/J \kappa^{-1} mol^{-1} = -67.505$
	action $\Delta G^{O}/J \text{ mol}^{-1}$
	10 ²
258.15 10.92 4,752.5 263.15 9.76 5,090.0	
268.15 8.76 5,427.5	
273.15 7.	.90 5,765.1
278.15 7. 283.15 6.	
	.49 6,440.1 .91 6,777.6
293.15 5.	.40 7,115.1
298.15 4.	.95 7,453.6
The smoothed data fit was added by the	e Volume Editor.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in	1. Radon.
the liquid and in the gaseous phase.	2. Methylbenzene (Toluene). Dried
	and distilled.
	1
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
Two tubes connected by a wide tap.	
To determine concentration of radon, each tube is placed in a condenser.	
	REFERENCES:

COMPONENTS:	ODICINAL WEACHDRAGAN	
1. Radon; $\frac{222}{86}$ Rn;	ORIGINAL MEASUREMENTS: Ramstedt, E.	
<pre>2. Dimethylbenzene (xylene); C₈H₁₀; 1330-20-7</pre>	<u>Le Radium</u> 1911, <u>8</u> , 253-256.	
VARIABLES:	PREPARED BY:	
T/K: 291.15	W. Gerrard	
EXPERIMENTAL VALUES:		
T/K Mol Frac X ₁ x 1		
291.15 6.1		
The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa.		
The mole fraction solubility was calcu assumed that the Ostwald coefficient with the gram-mole volume of radon is 22,29	vas independent of pressure and that	
AUXILIARY INFORMATION		
METHOD:	SOURCE AND PURITY OF MATERIALS;	
Measurement of radioactivity in the liquid and in the gaseous phase.	1. Radon.	
the figure and in the gateout phase.	 Dimethylbenzene (xylene). Dried and distilled. Mixture of 	
	variable composition. 1,3-Di- methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di-	
	variable composition. 1,3-Di- methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and ethylbenzene 10 - 15 %.	
APPARATUS / PROCEDURE :	methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and	
Two tubes connected by a wide tap. To determine concentration of radon,	methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and ethylbenzene 10 - 15 %.	
Two tubes connected by a wide tap.	methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and ethylbenzene 10 - 15 %.	
Two tubes connected by a wide tap. To determine concentration of radon,	methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and ethylbenzene 10 - 15 %. ESTIMATED ERROR:	
Two tubes connected by a wide tap. To determine concentration of radon,	methylbenzene 40 - 48 %, 1,2-di- methylbenzene 20 - 24 %, 1,4-di- methylbenzene 16 - 20 %, and ethylbenzene 10 - 15 %.	

COMPONENTS: 222 Pr. 14859-67-7	ORIGINAL MEASUREMENTS:
1. Radon-222; 86 ^{Rn} ; 14859-67-7	Lurie, A. Thesis
2. Dimethylbenzene; C ₈ H ₁₀ ; 1330-20-7	University of Grenoble, 1910
0 10	Microfilm available. See also Tables annuelles de con-
	stantes et donnees numeriques de
	chemie, de physique et de technologie
	1913 (for 1911), <u>2</u> , 401.
VARIABLES:	PREPARED BY: W. Gerrard
T/K: 253.15 - 343.15	W. Gerraru
EXPERIMENTAL VALUES:	
T/K Mol Frac	ction Ostwald 0 ² Coefficient
253.15 -	27.55
273.15 -	19.56
291.15 7.32 293.15 -	2 15.4 15.1
323.15 -	7.2
343.15 -	4.8
The such as a first set of the se	
The author reported a coefficient of a the same meaning as the ratio of conce	
in the liquid/concentration of radon i	n the gas. The coefficient of
absorption has been labelled as the Os	
The coefficient of absorption was meas	sured at a radon partial pressure of
less than 0.1 kPa at equilibrium. The	e radon was present in a carrier gas
(air or nitrogen) at an initial pressu	re of about 101 kPa.
The mole fraction solubility at 101.32 It was assumed that the Ostwald coeffi	5 kPa was calculated by the compiler.
and that the gram-mole volume of rador	is 22,290 cm ³ at 273.15 K and
and that the gram-mole volume of rador 101.325 kPa.	is 22,290 cm ³ at 273.15 K and
lol.325 kPa.	is 22,290 cm ³ at 273.15 K and
and that the gram-mole volume of rador 101.325 kPa.	is 22,290 cm ³ at 273.15 K and
and that the gram-mole volume of rador 101.325 kPa.	is 22,290 cm ³ at 273.15 K and
lol.325 kPa.	is 22,290 cm ³ at 273.15 K and
101.325 kPa.	is 22,290 cm ³ at 273.15 K and
101.325 kPa.	is 22,290 cm ³ at 273.15 K and INFORMATION
101.325 kPa.	is 22,290 cm ³ at 273.15 K and
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the	is 22,290 cm ³ at 273.15 K and INFORMATION
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of</pre>
LOL.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%. 1,2-dimethylbenzene 20 - 24%</pre>
LOL.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24% 1,4-dimethylbenzene 16 - 20%, and</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: I. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24% 1,4-dimethylbenzene 16 - 20%, and</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: I. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24% 1,4-dimethylbenzene 16 - 20%, and</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and</pre>
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101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%.</pre>
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101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%. ESTIMATED ERROR:</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%. ESTIMATED ERROR:</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%. ESTIMATED ERROR:</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%. ESTIMATED ERROR:</pre>
101.325 kPa. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>I is 22,290 cm³ at 273.15 K and INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon 2. Dimethylbenzene. Purity of liquid not specified. Mixture of isomers. 1,3-Dimethylbenzene 40 - 48%, 1,2-dimethylbenzene 20 - 24%, 1,4-dimethylbenzene 16 - 20%, and ethylbenzene 10 - 15%. ESTIMATED ERROR:</pre>

COMPONENTS :	ORIGINAL MEASUREMENTS:	
L. Radon; 222 1. Radon; 86 ^{Rn} ; 14859-67-7	Hofbauer, G.	
2. Methanol; CH ₄ O; 67-56-1		
	Sitzungsber. Akad. Wiss. Wien, <u>Math. Naturwiss. Kl</u> . Abt. $2A$ 1914, <u>123</u> , 2001 - 2009.	
VARIABLES:	PREPARED BY:	
T/K: 276.95 - 302.75	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald X ₁ x 10 ² Coefficient L		
276.95 1.32 7.43 289.35 0.980 5.71 302.75 (5.37)* *Operational defect.		
The author reported a coefficient of solubility, α' , based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef- ficient above. It was measured at a radon partial pressure of probably les than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa.		
that the Ostwald coefficient was indep mole volume of radon is 22,290 cm ³ at	273.15 K and 101.325 kPa.	
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = -16,003 + 93.764 T$ $\Delta H^{\circ}/J \mod^{-1} = -16,003, \Delta S^{\circ}/J K^{-1} \mod^{-1} = -93.764$		
T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ $X_1 \times 10^2$		
273.15 1.45 9,608 278.15 1.28 10,077 283.15 1.13 10,546 288.15 1.01 11,014 293.15 0.90 11,484		
	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS;	
The method was based on the technique	l. Radon.	
of Kofler (1,2). The radon radio- activity was measured in both the liquid and gaseous phases.	2. Methanol. Purified by distil- lation. The density was given.	
The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram.		
	ESTIMATED ERROR:	
	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad</u> . <u>Wiss. Wien</u> 1912, <u>121</u> , 2169.	
	2. Kofler, M. <u>Monatsh</u> . 1913, <u>34</u> , 389.	

COMPONENTS:	EVALUATOR:
 Radon-222; ²²²₈₆Rn; 14859-67-7 Ethanol; C₂H₆O; 64-17-5 	H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A.
	August 1978

CRITICAL EVALUATION:

Four laboratories report the solubility of radon-222 in ethanol. Traubenberg (1) reports a solubility relative to water at room temperature, Boyle (2) reports an Ostwald coefficient at 287.15 K, Ramstedt (3) reports Ostwald coefficients at 255.15, 273.15 and 291.15 K, and Hofbauer (4) reports four Ostwald coefficients between 275.15 and 310.95 K.

In the experience of the evaluator both Boyle's and Ramstedt's data are usually more reliable than Hofbauer's data. For the radon + ethanol system Hofbauer's solubility values are a consistent 15.0 to 16.5 percent higher than Ramstedt's values over the temperature range of common measurement of 273.15 to 298.15 K. For this system Boyle's single value agrees better with the Hofbauer data than the Ramstedt data. Although the evidence is conflicting, the evaluator prefers the Ramstedt data.

The tentative values of the thermodynamic changes for the transfer of one mole of radon from the gas at 101.325 kPa (1 atm) to the hypothetical unit mole fraction solution are the values from the Ramstedt data:

 $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -11,900 + 75.819 T$ Std. Dev. $\Delta G^{O} = 12.9$, Coef. Corr. = 0.9998 $\Delta H^{O}/J \text{ mol}^{-1} = -11,900$, $\Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -75.819$

A table of tentative mole fraction solubility and Gibbs energy values as a function of temperature at 5 degree interval between 258.15 and 298.15 K appears on the radon + ethanol data sheet of Ramstedt, and below.

REFERENCES

- 1. Traubenberg, H. F. R. Phys. Z. 1904, 5, 130.
- 2. Boyle, R. W. Phil. Mag. 1911, 22, 840.
- 3. Ramstedt, E. Le Radium 1911, 8, 253.
- 4. Hofbauer, G. Sitzungsber. Akad. Wiss. Wien. Math. Naturwiss. Kl. Abt. 2A 1914, 123, 2001.
- TABLE 1. The solubility of radon-222 in ethanol. The tentative mole fraction solubility of radon at a partial pressure of 101.325 kPa (1 atm), and the Gibbs energy change on solution as a function of temperature.

T/K	Mol Fraction $X_1 \times 10^2$	∆G ^O /J mol ⁻¹
258.15	2.80	7,673.0
263.15	2.52	8,052.1
268.15	2.28	8,431.2
273.15	2.07	8,810.3
278.15	1.88	9,189.4
283.15	1.72	9,568.4
288.15	1.57	9,947.5
293.15	1.44	10,326
298.15	1.33	10,705

COMPONENTS:	222	ORIGINAL MEASU	REMENTS :	
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7		Traubenberg	Traubenberg, H.F.R.	
		Phys. Z.		
2. Ethanol; C ₂ H ₆ O; 64-17-5		1904, 5, 130) - 134.	
	2 0			
VARIABLES:			<u></u>	
VARIABLES.		PREPARED BY:		
		W	Gerrard	
EXPERIMENTAL V	ALUES:			
1	т/к	Ratio compared	Ostwald	
		with water*	Coefficient	
			L	
	"Room temperature"	16.1	4.83	
	the base of the base of the	2		
1	*water was taken as 0.	3		
The author	reported his solubilit	v value as an ab	sorption coefficient based	
on the conc	entration ratio of rad	on in the gas and	in the liquid phases.	
It has been	labelled as an Ostwal	d coefficient ab	ove. The solubility was	
measured at	a radon partial press	sure of less than	0.1 kPa. The liquid was	
also satura	ted with air as a carr	ier gas at a pre	ssure of about 100 kPa.	
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Ì				
1				
	ΔΗΥΤ	LIARY INFORMATION		
METHOD:		SOURCE AND PUL	RITY OF MATERIALS;	
Measurement	of radioactivity.	Not stated.		
	-			
APPARATUS/PROC	CEDURE :	ESTIMATED ERR		
		Traubenberg	's values appear to be	
El cotros cor	a for moneyromont of	low when con	mpared with values re-	
radioactivi	be for measurement of	ported by o	ther workers.	
1		REFERENCES:		
!				
1				
]				

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² 86Rn; 14859-67-7	Boyle, R. W.
2. Ethanol; C ₂ H ₆ O; 64-17-5	
2 0	Phil. Mag. 1911, 22, 840- 854.
VARIABLES: T/K: 287.15	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Fract	ion Ostwald
X ₁ × 10	² Coefficient
287.15 1.81	<u>L</u> 7.34
	bility, s, as $(e_1/V_1)/(e_2/V_2)$ where e_1
is emanation in volume V ₁ of liquid, qas. The partial pressure of radon i	and e_2 is emanation in volume v_2 or s less than 0.1 kPa. The liquid is
also saturated with carrier gas (air	
pressure, originally about 101 kPa.	
The mole fraction solubility at 101.3	25 kPa (1 atm) was calculated by the
compiler. It was assumed that the Ost pressure and that the gram-mole volum	e of radon is 22,290 cm ³ at 273.15 K
and 101.325 kPa.	•
AUXILIARY	INFORMATION
METHOD: SOURCE AND PURITY OF MATERIALS:	
Radon-222 in a carrier gas (air, or	SOURCE AND PURITY OF MATERIALS:
	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
other gas not specified) is shaken	1. Radon-222.
other gas not specified) is shaken with a measured volume of liquid.	
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope.	 Radon-222. Ethanol. Density at 287.15 K is
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope.	 Radon-222. Ethanol. Density at 287.15 K is 0.796 g cm⁻³.
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm . ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivity, the	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm . ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivity, the bulbs are separately placed near to the electroscope. A diagram is given	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivity, the bulbs are separately placed near to	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm . ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivity, the bulbs are separately placed near to the electroscope. A diagram is given	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm ESTIMATED ERROR:</pre>
other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivity, the bulbs are separately placed near to the electroscope. A diagram is given	<pre>1. Radon-222. 2. Ethanol. Density at 287.15 K is 0.796 g cm ESTIMATED ERROR:</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Ramstedt, E.
 Ethanol (Ethyl Alcohol); C₂H₆O; 64-17-5 	Le <u>Radium</u> 1911, <u>8</u> , 253-256.
VARIABLES:	PREPARED BY:
т/к: 255.15 - 291.15	W. Gerrard
	w. Gerrard
EXPERIMENTAL VALUES: T/K MOL Frac	tion Ostwald
X ₁ × 1	10 ² Coefficient L
255.15 2.98	$\frac{11.4}{11.4}$
273.15 2.08	
291.15 1.49	
The Ostwald coefficient was measured a	at a radon partial pressure of less
nitrogen) at an initial pressure of a	on was present in a carrier gas (air or bout 101 kPa.
	alated by the compiler. It was assumed
that the Ostwald coefficient was indep mole volume of radon is 22,290 cm ³ at	pendent of pressure and that the gram-
Smoothed data: $\Delta G^{O}/J \mod^{-1} = -RT \ln X$	$x_1 = -11,900 + 75.819 \text{ T}$
Std. Dev. $\Delta G = 12.9$, G	+
$\Delta H^{\prime}/J \mod 1 = -11,900,$	$\Delta s^{\circ}/J \kappa^{-1} mol^{-1} = -75.819$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
x ₁ x	102
258.15 2.8	7,673.0
263.15 2.5	
268.15 2.2	
273.15 2.0	
278.15 1.8 283.15 1.7	
288.15 1.5	57 9,947.5
293.15 1.4	
298.15 1.3	10,705
The smoothed data fit was added by the	e Volume Editor.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in the	l. Radon.
liquid and in the gaseous phase.	2 Rehanal (Rehall Markel) Duri-3
	 Ethanol (Ethyl Alcohol). Dried and distilled.
	and utstilled.
1	
]	
1	}
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
Two tubes connected by a wide tap.	
To determine concentration of radon, each tube is placed in a condenser.	
each cube is placed in a condensel.	REFERENCES :
	ALL DADIGED,
	L

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7	Hofbauer, G.
2. Ethanol (Ethyl Alcohol); C ₂ H ₆ O;	
64-17-5 2 0	Stizungsber. Akad. Wiss. Wien,
	Math. Naturwiss. Kl. Abt. 2A 1914,
	123, 2001 - 2009.
VARIABLES:	PREPARED BY:
	W. Gerrard
T/K: 275.15 - 310.95	
EXPERIMENTAL VALUES: T/K Mol Frac	
x ₁ . x 1	
275.15 2.37	
287.75 288.65 1.76	(7.42)* 5 7.23
288.85	(7.43)*
302.35 1.39 310.95 1.28	
*Operational def	
The mole fraction solubility was calcu	lated by the compiler. It was assumed
that the Ostwald coefficient was indep mole volume of radon is 22,290 cm ³ at	273.15 K and 101.325 kPa.
	κ ₁ = -12,344 + 76.160 T
Std. Dev. $\Delta G^{\circ} = 70.6$,	Coef. Corr. = 0.9983
$\Delta H^{O}/J \text{ mol}^{-1} = -12,344$	$\Delta S^{O}/J K^{-1} mol^{-1} = -76.160$
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$
<u> </u>	
273.15 2.41 8,459.2 278.15 2.19 8,840.1	
283.15 1.99 9,220.9	
288.15 1.8 293.15 1.6	•
298.15 1.1	
303.15 1.4 308.15 1.5	
308.15 1.3 313.15 1.3	•
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: The method was based on the tech-	SOURCE AND PURITY OF MATERIALS:
nique of Kofler (1,2). The radon	1. Radon.
radioactivity was measured in both the liquid and gaseous phases.	2. Ethanol (Ethyl Alcohol).
The apparatus consists of two glass	Purified by distillation. The density was given.
bulbs connected by a tap. Each bulb carries two separate taps. Both	
Hofbauer and Kofler give a diagram.	
	1
The author reported a coefficient of solubility, α' , based on the radon	
concentration ratio in the liquid and	
gaseous phases at equilibrium by radioactivity. The coefficient of	ESTIMATED ERROR:
solubility is labelled an Ostwald co-	
efficient above. It was measured at	
a radon partial pressure of probably less than 0.1 kPa at equilibrium.	
The liquid was also saturated with	REFERENCES :
air as a carrier gas at an initial pressure of about 100 kPa.	1. Kofler, M.
Freeburg of about too weat	Sitzungsber. Akad. Wiss. Wien
	1912, 121, 2169.
	2. Kofler, M.
	<u>Monatsh</u> . 1913, <u>34</u> , 389.
	l

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7	Hofbauer, G.
2. 1-Propanol; C ₃ H ₈ O; 71-23-8	
	Sitzungsber. Akad. Wiss. Wien,
	Math. Naturwiss. Kl. Abt. 2A 1914,
	123, 2001.
VARIABLES:	PREPARED BY:
	W. Gerrard
T/K: 286.75 - 303.35	
EXPERIMENTAL VALUES:	ction Ostwald
X ₁ × 1	
286.75 2.84	
303.35	(7.69)*
*Operational def	fect.
The author reported a coefficient of a	solubility, a', based on the radon
concentration ratio in the liquid and	
radioactivity. The coefficient of sol	Lubility is labelled an Ostwald coef-
ficient above. It was measured at a p that 0.1 kPa at equilibrium. The liqu	radon partial pressure of probably less
carrier gas at an initial pressure of	about 100 kPa.
The mole fraction solubility was calculated that the Ostwald coefficient was inder	lated by the compiler. It was assumed pendent of pressure and that the gram-
mole volume of radon is 22,290 cm ³ at	273.15 K and 101.325 kPa.
AUXILIARY	INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The method was based on the technique	1. Radon.
of Kofler (1,2). The radon radio-	
activity was measured in both the	2. 1-Propanol. Purified by distillation. The density
liquid and gaseous phases.	was given.
The apparatus consists of two glass	
bulbs connected by a tap. Each bulb	
carries two separate taps. Both Hofbauer and Kofler give a diagram.	
norbader and korrer give a dragram.	
	ESTIMATED ERROR:
	REFERENCES :
	 Kofler, M. Sitzungsber. Akad. Wiss. Wien
	<u>1912, <u>121</u>, 2169.</u>
	2 Kofler M
	2. Kofler, M.
	Monatsh. 1913, <u>34</u> , 389.

COMDONENTE -		
COMPONENTS: 1. Radon; ²²² Rn; 14859-67-7	ORIGINAL MEASUREMENTS: Hofbauer, G.	
00		
2. 2-Propanol; C ₃ H ₈ O; 67-63-0		
	Sitzungsber. Akad. Wiss. Wien, Math. Naturwiss. Kl. Abt. 2A 1914,	
	123, 2001 - 2009.	
VARIABLES: T/K: 287.45 - 300.35	PREPARED BY: W. Gerrard	
	4	
EXPERIMENTAL VALUES:	L	
T/K Mol Frac		
$\frac{x_1 \times x_2}{287.45}$		
300.35 1.90		
The author reported a coefficient of solubility, α' , based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald Coef- ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa.		
The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that tha gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln 2$	$x_1 = -10,389 + 67.541 \text{ T}$	
$\Delta H^{O}/J \text{ mol}^{-1} = -10,389$	$^{-}\Delta s^{\circ}/J K^{-1} mol^{-1} = -67.541$	
T/K Mol Fra	action $\Delta G^{O}/J \text{ mol}^{-1}$	
x ₁ ×	10 ²	
283.15 2.45 8,735		
288.15 2.27 9,073 293.15 2.10 9,411		
298.15 1.96 9,749 303.15 1.83 10,086		
The smoothed data fit was added by the		
AUXILIARY	INFORMATION	
METHOT /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS:		
The method was based on the technique of Kofler (1,2). The radon radio-	l. Radon.	
activity was measured in both the liquid and gaseous phases.	2. 2-Propanol. Purified by distil- lation. The density was given.	
The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram.		
	ESTIMATED PROPA	
ļ	ESTIMATED ERROR:	
	REFERENCES :	
	<pre>1. Kofler, M. Sitzungsber. Akad. Wiss. Wien 1912, 121, 2169.</pre>	
	<pre>2. Kofler, M. Monatsh. 1913, 34, 389.</pre>	

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; 222 86^{Rn}; 14859-67-7 1. Hofbauer, G. 1-Butanol; C₄H₁₀O; 71-36-3 2. <u>Sitzungsber</u>. <u>Akad</u>. <u>Wiss</u>. <u>Wien</u>, <u>Math. Naturwiss</u>. <u>Kl</u>. <u>Abt</u>. 2A 1914, 123, 2001 - 2009.VARIABLES: PREPARED BY: T/K: 284.35 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald Coefficient $x_1 \times 10^2$ \mathbf{L} 284.35 3.72 9.79 The author reported a coefficient of solubility, α ', based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef-ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa. The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the grammole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. The mole fraction solubility was calculated for a radon partial pressure of 101.325 kPa. AUXILIARY INFORMATION METHOD /APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: The method was based on the technique 1. Radon. of Kofler (1,2). The radon radio-activity was measured in both the 2. 1-Butanol. Purified by liquid and gaseous phases. distillation. The density was given. The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram. ESTIMATED ERROR: **REFERENCES:** 1. Kofler, M. Sitzungsber. Akad. Wiss. Wien 1912, 121, 2169. 2. Kofler, M. Monatsh. 1913, 34, 389.

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COMPONENTS: 1. Radon; ²²² Rn; 14859-67-7		ORIGINAL MEASUREMENTS: Hofbauer, G.
		horbader, G.
2. 2-Butanol; C ₄ H ₁₀ O;	78-92-2	
		<u>Sitzungsber. Akad. Wiss. Wien,</u> <u>Math. Naturwiss. Kl. Abt</u> . 2A 1914, <u>123</u> , 2001 - 2009.
VARIABLES:		PREPARED BY:
Т/К; 289.85		W. Gerrard
EXPERIMENTAL VALUES:		
	T/K Mol Frac X ₁ x 1	
-	<u>x_1</u>	
2	289.85 2.86	7.58
The author reported a coefficient of solubility, α' , based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef- ficient above. It was measured at a radon partial pressure of probably le than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa.		
The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram- mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa. The mole fraction solubility is for a radon partial pressure of 101.325 kPa.		
AUXILIARY INFORMATION		INFORMATION
METHOD/APPARATUS/PROCEDU	JRE :	SOURCE AND PURITY OF MATERIALS:
The method was based on		1. Radon.
of Kofler (1,2). The r activity was measured i	adon radio-	
was measured 1		2. 2-Butanol Purified by
liquid and gaseous phas		2. 2-Butanol. Purified by distillation. The density
	ses. of two glass ap. Each bulb aps. Both	
liquid and gaseous phas The apparatus consists bulbs connected by a ta carries two separate ta	ses. of two glass ap. Each bulb aps. Both	distillation. The density
liquid and gaseous phas The apparatus consists bulbs connected by a ta carries two separate ta	ses. of two glass ap. Each bulb aps. Both	distillation. The density
liquid and gaseous phas The apparatus consists bulbs connected by a ta carries two separate ta	ses. of two glass ap. Each bulb aps. Both	distillation. The density was given.
liquid and gaseous phas The apparatus consists bulbs connected by a ta carries two separate ta	ses. of two glass ap. Each bulb aps. Both	distillation. The density was given. ESTIMATED ERROR:
liquid and gaseous phas The apparatus consists bulbs connected by a ta carries two separate ta	ses. of two glass ap. Each bulb aps. Both	distillation. The density was given.

COMPONENTS :	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Hofbauer, G.	
<pre>2. 2-Methyl-l-Propanol; C₄H₁₀O; 78-83-1</pre>	<u>Sitzungsber. Akad. Wiss. Wien.</u> Math. Naturwiss. Kl. Abt. 2A 1914, 123, 2001 - 2009.	
VARIABLES: T/K: 276.55 - 305.15	PREPARED BY: W. Gerrard	
EXPERIMENTAL VALUES:	I	
T/K Mol Frac	ction Ostwald	
	LO ² Coefficient	
276.55 4.12 289.45 3.30 305.15	2 10.42 0 8.41 (6.63)*	
*Operational def	lect.	
The author reported a coefficient of solubility, α' , based on the radon of centration ratio in the liquid and gaseous phases at equilibrium by radio activity. The coefficient of solubility is labelled an Ostwald coefficien above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrigas at an initial pressure of about 100 kPa.		
that the Ostwald coefficient was indep mole volume of radon is $22,290 \text{ cm}^3$ at	273.15 K and 101.325 kPa.	
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln \lambda$ $\Delta H^{O}/J \text{ mol}^{-1} = -11,450$	$K_1 = -11.450 + 67.919 T$, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -67.919$	
T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ $X_1 \times 10^2$		
	00 7,442 The smoothed data 57 7,782 fit was added by 87 8,121 the Volume Editor.	
	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
The method was based on the technique of Kofler (1,2). The radon radio- activity was measured in both the liquid and gaseous phases.	 Radon. 2-Methyl-l-propanol. Purified by distillation. The density was given. 	
The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram.		
The mole fraction solubility values above are for a radon partial pressure of 101.325 kPa.	ESTIMATED ERROR:	
	DEFENSIVE.	
	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> 1912, <u>121</u> , 2169.	
	2. Kofler, M. <u>Monatsh</u> . 1913, <u>34</u> , 389.	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Hofbauer, G.	
2. 3-Methyl-1-Butanol; C ₅ H ₁₂ O; 123-51-3	<u>Sitzungsber. Akad. Wiss. Wien,</u> Math. <u>Naturwiss. Kl. Abt</u> . 2A 1914, <u>123</u> , 2001 - 2009.	
VARIABLES: T/K: 273.25 - 298.25	PREPARED BY: W. Gerrard	
EXPERIMENTAL VALUES:	attion Octuald	
<u></u>	ction Ostwald 10 ² Coefficient L	
273.25 5.2 280.05 4.5 288.15 4.0 298.25 3.4	8 10.03 2 9.02	
The author reported a coefficient of solubility, α' , based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef- ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa.		
The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and tha the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln$	Х ₁ = -11,544 + 66.799 Т	
Std. Dev. $\Delta G^{O} = 11.3$,	Coef. Corr. = 0.9999	
$\Delta H^{O}/J \mod^{-1} = -11,546, \Delta S^{O}/J K^{-1} \mod^{-1} = -66.799$ T/K Mol Fraction $\Delta G^{O}/J \mod^{-1}$ $X_{1} \times 10^{2}$		
	23 6,702.6	
278.15 4. 283.15 4.	77 7,036.6 37 7,370.6	
	01 7,704.5	
293.15 3.	70 8,038.5	
298.15 3.	41 8,372.5	
AUXILIARY	INFORMATION	
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
The method was based on the technique	l. Radon.	
of Kofler (1,2). The radon radio- activity was measured in both the liquid and gaseous phases.	 3-Methyl-l-Butanol. Purified by distillation. The density was given. 	
The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram.		
The mole fraction solubility values above were calculated for a radon		
partial pressure of 101.325 kPa.	ESTIMATED ERROR:	
	REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien</u> 1912, <u>121</u> , 2169.	
	2. Kofler, M. <u>Monatsh</u> . 1913, <u>34</u> , 389.	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Lurie, A. Thesis	
2. 1-Pentanol (Amyl Alcohol);	University of Grenoble, 1910	
$C_{5}H_{12}O; 71-41-0$	See also Tables annuelles de con-	
	stantes et donnees numeriques de	
	chemie, de physique et de technologie 1913 (for 1911), <u>2</u> , 401.	
VARIABLES: T/K: 291.15	PREPARED BY: W. Gerrard	
1/1. 291.15	n. Gerrara	
EXPERIMENTAL VALUES:	tion Ostwald	
x, x 1	0 ² Coefficient	
291.15 4.72	10.6	
The author reported a coefficient of a the same meaning as the ratio of conce	bsorption, α , which appears to have	
in the liquid/concentration of radon i absorption has been labelled as the Os	n the gas. The coefficient of	
The coefficient of absorption was meas		
less than 0.1 kPa at equilibrium. The (air or nitrogen) at an initial pressu	radon was present in a carrier gas	
The mole fraction solubility at 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure		
and that the gram-mole volume of radon 101.325 kPa.	1s 22,290 cm ⁻ at 2/3.15 K and	
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon in the	1. Radon.	
gas and liquid phases determined by measurements of radioactivity. An	2. 1-Pentanol (Amyl Alcohol).	
aluminum foil electroscope was used	Purity of liquid not specified.	
to measure the radioactivity. Diagrams given by Lurie.		
1	ESTIMATED ERROR:	
	REFERENCES :	

CONTROL REAL	
COMPONENTS: 1. Radon-222; ²²² Rn; 14859-67-7	ORIGINAL MEASUREMENTS: Boyle, R.W.
00	
2. 1-Pentanol (Amyl Alcohol); C ₆ H ₁₂ O; 71-41-0	
6-12-7	Phil. Mag. 1911, 22, 840-854.
VARIABLES:	PREPARED BY:
т/к: 287.15	W. Gerrard
EXPERIMENTAL VALUES:	
T/K Mol F	raction Ostwald
x ₁	x 10 ² Coefficient L
287.15 4	.11 9.31
	lubility, s, as $(e_1/V_1)/(e_2/V_2)$ where
	uid, and e_2 is emanation in volume v_2
of gas. The partial pressure of ra	don is less than 0.1 kPa. The liquid
is also saturated with carrier gas pressure, originally about 101 kPa.	(air or another gas) at the prevailing
• •	
compiler. It was assumed that the	
pressure and that the gram-mole vol	ume of radon is 22,290 cm ³ at 273.15 K
and 101.325 kPa.	
AUXILIA	NRY INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
METHOD: Radon-222 in a carrier gas (air, or	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD:	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol).
<pre>METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope.</pre> APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR: $\delta T/K = 0.2$ $\delta L/L = 0.03$
<pre>METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope.</pre> APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi the bulbs are separately placed ne	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi the bulbs are separately placed ne to the electroscope. A diagram is	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi the bulbs are separately placed ne to the electroscope. A diagram is	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi the bulbs are separately placed ne to the electroscope. A diagram is	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>
METHOD: Radon-222 in a carrier gas (air, or other gas not specified) is shaken with a measured volume of liquid. Radioactivity is determined in the gas and liquid phases by gamma-ray electroscope. APPARATUS/PROCEDURE: The sampling bulb and mixing bulb are connected by a three-way tap. For the measurement of radioactivi the bulbs are separately placed ne to the electroscope. A diagram is	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1-Pentanol (Amyl Alcohol). ESTIMATED ERROR:</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; $\frac{222}{86}$ Rn; 14859-67-7	Ramstedt, E.
<pre>2. 1,2,3-Propanetriol (Glycerol); C₃H₈O₃; 56-81-5</pre>	<u>Le Radium</u> 1911, <u>8</u> , 253-256.
VARIABLES:	PREPARED BY:
T/K: 291.15	
	W. Gerrard
Annual	
EXPERIMENTAL VALUES:	
T/K Mol Frac	
X, x 1	.0 ² Coefficient L
291.15 0.0645	0.21
The Ostwald coefficient was measured a than 0.1 kPa at equilibrium. The rado or nitrogen) at an initial pressure of The mole fraction solubility was calcu assumed that the Ostwald coefficient w	n was present in a carrier gas (air about 101 kPa. lated by the compiler. It was
the gram-mole volume of radon is 22,29 The mole fraction solubility is calcul 101.325 kPa.	0 cm^3 at 273.15 K and 101.325 kPa.
AUXILIARY	
	INFORMATION
METUOD.	
	SOURCE AND PURITY OF MATERIALS:
METHOD: Measurement of radioactivity in the liquid and in the gaseous phase.	
	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol).
Measurement of radioactivity in	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol).
Measurement of radioactivity in the liquid and in the gaseous phase.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol).
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled.
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled.
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled.
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled. ESTIMATED ERROR:
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled. ESTIMATED ERROR:
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled. ESTIMATED ERROR:
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled. ESTIMATED ERROR:
Measurement of radioactivity in the liquid and in the gaseous phase. APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon,	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. 1,2,3-Propanetriol (Glycerol). Dried and distilled. ESTIMATED ERROR:

COMPONENTS: 1. Radon-222; ²²² ₈₆ Rn; 14859-67-7 2. 1,2,3-Propanetriol (Glycerol); C ₃ H ₈ O ₃ ; 56-81-5 VARIABLES: T/K: 276.15 - 323.15	ORIGINAL MEASUREMENTS: Lurie, A. Thesis University of Grenoble, 1910 Microfilm available. See also Tables annuelles de con- stantes et donnees numeriques de chemie, de physique et de tech- nologie 1913 (for 1911), <u>2</u> , 401. PREPARED BY: W. Gerrard
_,	May 1977
	Ostwald oefficient L
276.15 291.15 303.15 323.15	2.87 1.7 0.6 0.09
The author reported a coefficient of a the same meaning as the ratio of conce in the liquid/concentration of radon i absorption has been labelled as the Os	ntrations: concentration of radon n the gas. The coefficient of
The coefficient of absorption was meas less than 0.1 kPa at equilibrium. The (air or nitrogen) at an initial pressu	e radon was present in a carrier gas
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity. Diagrams given by Lurie.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon. 2. 1,2,3-Propanetriol (Glycerol). Purity of liquid not specified.</pre>
	DATA CLASS:
	ESTIMATED ERROR:
	REFERENCES :

COMPONENTS : ORIGINAL MEASUREMENTS: 1. Radon-222; ²²²₈₆Rn; 14859-67-7 Ramstedt, E. Le Radium 1911, 8, 253 - 256. 2. l,l-Oxybisethane (Diethyl Ether); C₄H₁₀O; 60-29-7 VARIABLES: PREPARED BY: T/K: 255.15 - 291.15 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald Coefficient $X_1 \times 10^2$ L 29.1 255.15 12.1 20.9 273.15 8.62 291.15 6.16 15.08 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility of radon at a partial pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 $\rm cm^3$ at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{0}/J \mod^{-1} = -RT \ln X_{1} = -11,599 + 62.956 T$ Std. Dev. $\Delta G^0 = 27.1$, Coef. corr. = 0.9997 $\Delta H^{\circ}/J \mod^{-1} = -11,599, \Delta S^{\circ}/J K^{-1} \mod^{-1} = -62.956$ Mol Fraction $\Delta G^{0}/J \mod^{-1}$ T/K $X_1 \times 10^2$ 258.15 11.4 4,653.5 4,968.3 263.15 10.3 5,283.1 268.15 9.35 5,597.9 273.15 8.50 5,912.6 7.76 278.15 283,15 7.10 6,227.4 6,542.2 6.52 288.15 6.00 6,857.0 293.15 7,171.7 5.54 298.15 The smoothed data was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: Measurement of radioactivity in the 1. Radon-222. liquid and in the gaseous phase. 2. 1,1-Oxybisethane. Dried and distilled. ESTIMATED ERROR: **APPARATUS / PROCEDURE :** Two tubes connected by a wide tap. To determine concentration of radon, each tube is placed in a condenser. REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² Rn; 14859-67-7 86	Ramstedt, E.	
2. 2-Propanone (Acetone); C ₃ H ₆ O; 67-64-1	<u>Le Radium</u> 1911, <u>8</u> , 253-256.	
VARIABLES:	PREPARED BY:	
т/к: 255.15 - 291.15	TREFARED DI	
	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Frac	tion Ostwald	
X, x 1	0 ² Coefficient L	
255.15 3.49		
273.15 2.50		
291.15 1.89 The Ostwald coefficient was measured a	6.30	
than 0.1 kPa at equilibrium. The rade	on was present in a carrier gas (air or	
nitrogen) at an initial pressure of ab	out 101 kPa.	
The mole fraction solubility was calcu that the Ostwald coefficient was indep mole volume of radon is 22,290 cm ³ at	lated by the compiler. It was assumed bendent of pressure and that the gram- 273.15 K and 101.325 kPa.	
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X$		
Std. Dev. ΔG = 8.8, Co		
	$\Delta S^{O}/J K^{-1} mol^{-1} = -69.138$	
	action $\Delta G^{O}/J \text{ mol}^{-1}$	
x ₁ ×	10 ²	
258.15 3.2		
	9 7,676.1	
268.15 2.74 8,021.7 273.15 2.51 8,367.4		
278.15 283.15 283.15 283.15 283.15 288.15 288.15 278.15 2.31 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 2713.1 271.		
		293.15 1.8
<u>298.15</u> 1.7	10,096	
The smoothed data fit was added by the	Volume Editor.	
AUXILIARY	INFORMATION	
ME THOD:	SOURCE AND PURITY OF MATERIALS:	
Measurement of radioactivity in the	1. Radon-222.	
liquid and in the gaseous phase.	2. 2-Propanone (Acetone). Dried	
The mole fraction solubility values were calculated for a radon partial pressure of 101.325 kPa.		
APPARATUS/PROCEDURE:	- ESTIMATED ERROR:	
Two tubes connected by a wide tap.		
To determine concentration of radon,		
each tube is placed in a condenser.	REFERENCES :	

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COMPONENTS: ORIGINAL MEASUREMENTS: 1. Radon; ²²²₈₆Rn; 14859-67-7 Nussbaum, E.; Hursh, J. B. 2. Formic Acid; CH₂O₂; 64-18-6 J. Phys. Chem. 1958, 62, 81 - 84. VARIABLES: PREPARED BY: T/K: 298.15 -,323.15 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald x1 Coefficient 298.15 0.00164 1.05 310.15 0.00145 0.96 323.15 0.00140 0.95 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. $\Delta G^{0}/J \text{ mol}^{-1} = -RT \ln X_{1} = -4,994.5 + 70.204 T$ Std. Dev. $\Delta G^{0} = 66$, Coef. Corr. = 0.9972 $\Delta H^{0}/J \text{ mol}^{-1} = -4,994.5$, $\Delta S^{0}/J K^{-1} \text{ mol}^{-1} = -70.204$ Smoothed Data: ∆G°/J mol⁻¹ Mol Fraction T/K 15,937 298.15 0.00161 303.15 0.00156 16,287 308.15 0.00151 16,638 0.00147 16,990 313.15 0.00142 17,341 318.15 17,692 0.00138 323.15 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: The concentration of radon was 1. Radon. determined by measurement of radio-2. Formic acid. Eastman Chemical Co. activity in sample withdrawn from the liquid and from the gas phases. Highest grade. The procedure was stated to be similar in principle to that of Boyle (1). ESTIMATED ERROR: APPARATUS / PROCEDURE : A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium iodide scintillation counter. **REFERENCES:** 1. Boyle, R. W. Phil. Mag. 1911, 22, 840.

COMPONENTS: 1. Radon-222; ${}^{222}_{86}$ Rn; 14859-67-7 2. Acetic Acid; C ₂ H ₄ O ₂ ; 64-19-7	EVALUATOR: H. L. Clever Chemistry Department Emory University Atlanta, GA 30322 U.S.A.
	August 1978

CRITICAL EVALUATION:

Hofbauer (1) reported four values of the solubility of radon-222 in acetic acid between 290.65 and 300.25 K, and Nussbaum and Hursh (2) reported three values between 298.15 and 323.15 K. The two smoothed data sets differ by 9-10 percent over the five degree range of common measurement, with the Hofbauer data having the higher values.

The agreement between the two data sets is marginal but within reason, when one considers the 0.1 kPa pressure of the gas in the measurement and the adjustment to the 101.325 kPa pressure for the mole fraction calculation. The two data sets were combined with a weight of 1 to Hofbauer data and a weight of 2 to the Nussbaum and Hursh data in a linear regression of a Gibbs energy equation linear in temperature. The result gives the tentative values for the transfer of one mole of radon from the gas at a partial pressure of 101.325 kPa to the hypothetical unit mole fraction solution of

 $\Lambda G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -12,805 + 80.750 T$

Std. Dev. $\Delta G^{O} = 121$, Coef. corr. = 0.9916

$$\Delta H^{O}/J \text{ mol}^{-1} = -12,805, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -80.750$$

The tentative solubility and Gibbs energy values as a function of temperature are in Table 1.

TABLE 1. The solubility of radon-222 in acetic acid. Tentative values of the mole fraction solubility at 101.325 kPa and the Gibbs energy changes as a function of temperature.

т/к	Mol Fraction $\frac{X_1 \times 10^2}{10^2}$	∆G ^O /J mol ⁻¹
288.15 293.15 298.15 303.15 308.15 313.15 313.15 318.15	1.270* 1.160* 1.060* 0.974 0.897 0.828 0.767	10,462 10,866 11,270 11,674 12,077 12,481 12,885
323.15	0.711	13,289

*Rounded to the nearest 0.005×10^{-2} .

REFERENCES.

 Hofbauer, G. Sitzugsber. Akad. Wiss. Wien, Math. Naturwiss. Kl. Abt. 2A 1914, 123, 2001.

2. Nussbaum, E.; Hursh, J. B. J. Phys. Chem. 1958, 62, 81.

ORIGINAL MEASUREMENTS: Hofbauer, G. <u>Sitzungsber. Akad. Wiss. Wien</u> ,		
Sitzungsber. Akad. Wiss. Wien,		
<u>Sitzungsber. Akad. Wiss. Wien</u> ,		
Sitzungsber. Akad. Wiss. Wien,		
Math. Naturwiss. Kl. Abt. 2A 1914,		
$\frac{Math.}{123}$, 2001		
PREPARED BY:		
W. Gerrard		
tion Ostwald		
Coefficient		
0 ² L		
(4.83)* 5.01		
4.98		
4.72 4.53		
[*] Operational defect. The author reported a coefficient of solubility, α', based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef- ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa.		
The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram- mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_{7} = -9.508.4 + 69.357 T$ Std. Dev. $\Delta G^{\circ} = 44.8$, Coef. Corr. = 0.9895 $\Delta H^{\circ}/J \mod^{-1} = -9,508.4$, $\Delta S^{\circ}/J K^{-1} \mod^{-1} = -69.357$		
ction $\Delta G^{\circ}/J \text{ mol}^{-1}$		
10 ²		
6 10,477 The smoothed data 8 10,823 fit was added by		
0 11,170 the Volume Editor.		
4 11,517 INFORMATION		
SOURCE AND PURITY OF MATERIALS:		
1. Radon.		
 Acetic acid. Purified by distil- lation. The density was given. 		
ESTIMATED ERROR:		
<pre>REFERENCES: 1. Kofler, M. <u>Sitzungsber. Akad. Wiss. Wien 1912, 121, 2169.</u> 2. Kofler, M. <u>Monatsh. 1913, 34</u>, 389.</pre>		

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.	
2. Acetic Acid; C ₂ H ₄ O ₂ ; 64-19-7		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 323.15	W. Gerrard May 1977	
EXPERIMENTAL VALUES:	L _{enn} ,	
T/K Mol Fraction Ostwald $X_1 \times 10^2$ Coefficient		
298.15 1.04	<u> </u>	
310.15 0.800 323.15 0.730	6 3.53	
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kP The liquid was therefore saturated with nitrogen at the experimental pressure.		
The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = -10,938 + 74.895 T$ Std. Dev. $\Delta G^{\circ} = 122$, Coef. Corr. = 0.9916 $\Delta H^{\circ}/J \mod^{-1} = -10,938$, $\Delta S^{\circ}/J K^{-1} \mod^{-1} = -74.895$		
T/K Mol Fraction $\Delta G^{\circ}/J \text{ mol}^{-1}$ X ₁ x 10 ²		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	11,392 The smoothed data 1 11,392 fit was added by 39 11,766 fit was added by 75 12,141 the Volume Editor 17 12,515 12,890	
AUXILIARY	INFORMATION	
METHOD: The concentration of radon was	SOURCE AND PURITY OF MATERIALS:	
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	 Acetic Acid. Eastman Chemical Co. Highest grade. 	
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE:		
A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium iodide scintillation counter.	REFERENCES :	
See the evaluation on page 291 for the tentative recommendation of thermodynamic and solubility values.	1. Boyle, R. W. <u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840.	

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COMPONENTS:	EVALUATOR:	
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	H. L. Clever Department of Chemistry	
2. Propanoic Acid; C ₃ H ₆ O ₂ ; 79-09-4	Emory University	
	Atlanta, GA 30322 U.S.A.	
	August 1978	
CRITICAL EVALUATION:		
Hofbauer (1) reported values of the radon-222 solubility in propanoic acid at temperatures of 293.85 and 302.85 K, and Nussbaum and Hursh (2) reported three values between temperatures of 298.15 and 323.15 K.		
The two data sets show more scatter than the same two laboratory's results for acetic acid. It is likely that the increase in solubility shown by the Nussbaum and Hursh data between temperatures of 310.15 and 323.15 K is in error. The 323.15 K solubility value was not used in the linear regression described below.		
The two data sets were combined on a one to one weight bases in a linear regression of a Gibbs energy equation linear in temperature. The result gives the tentative values for the thermodynamic changes for the transfer of one mole of radon from the gas at a partial pressure of 101.325 kPa to the hypothetical unit mole fraction solution of		
$\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -1!$	5,919 + 85.697 T	
Std. Dev. $\Delta G^{O} = 159.7$, Coef.	corr. = 0.9661	
$\Delta H^{O}/J \text{ mol}^{-1} = -15,919, \Delta S^{O}/J$	$K^{-1} mol^{-1} = -85.697$	
The tentative solubility and Gibbs end ture are in Table 1.	ergy values as a function of tempera-	
TABLE 1. The solubility of radon-222 in propanoic acid. Tentative values of the mole fraction solubility at 101.325 kPa partial pressure radon and the Gibbs energy change as a function of temperature.		
T/K Mol Frac	ction $\Delta G^{O}/J$ mol ⁻¹	
$x_1 \times x_1$		
293.15 2.29		
298.15 2.05 303.15 1.85	9,631.6 10,060	
308.15 1.67		
313.15 1.51	10,917 11,346	
318.15 1.37 323.15 1.25	11,774	
REFERENCES.		
1. Hofbauer, G. <u>Sitzugsber</u> . <u>Akad</u> . <u>Wiss</u> . <u>Wien</u> , <u>Math</u> . <u>Naturwiss</u> . <u>Kl</u> . <u>Abt</u> . <u>2A</u> 1914, <u>123</u> , 2001.		
2. Nussbaum, E.; Hursh, J. B. <u>J. Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 81.		

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²₈₆Rn; 14859-67-7 1. Hofbauer, G. Propanoic Acid; C₃H₆O₂; 79-09-4 Sitzungsber. Akad. Wiss. Wien, Math. Naturwiss. Kl. Abt. 2A 1914, 123, 2001. VARIABLES: PREPARED BY: W. Gerrard T/K: 283.05 - 302.85 EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald $x_1 \times 10^2$ Coefficient L 283.05 ---(8.74)*293.85 2.23 7.31 302.85 2.04 6.82 *Operational defect. The author reported a coefficient of solubility, $\boldsymbol{\alpha}^{\,\prime}\,,$ based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef-ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa. The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 and 101.325 kPa. $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_1 = -7,321.1 + 56.535 T$ $\Delta H^{O}/J \text{ mol}^{-1} = -7,321.1, \Delta S^{O}/J \text{ K}^{-1} \text{ mol}^{-1} = -56.535$ Smoothed Data: Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ T/K $x_{1} \times 10^{2}$ 2.25 293.15 9,252.2 298.15 2.14 9,534.8 303.15 2.03 9,817.5 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION SOURCE AND PURITY OF MATERIALS: METHOD /APPARATUS/PROCEDURE: The method was based on the technique 1. Radon. of Kofler (1,2). The radon radioactivity was measured in both the Propanoic Acid. Purified by distillation. The density was liquid and gaseous phases. given. The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both Hofbauer and Kofler give a diagram. ESTIMATED ERROR: **REFERENCES**: See the evaluation on page 294 for the 1. Kofler, M. tentative recommendation of solubility Sitzungsber. Akad. Wiss. Wien and thermodynamic values. 1912, <u>121</u>, 2169. 2. Kofler, M. Monatsh. 1913, 34, 389.

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COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²₈₆Rn; 14859-67-7 1. Nussbaum, E.; Hursh, J. B. Propanoic Acid; C₃H₆O₂; 79-09-4 2. J. Phys. Chem. 1958, 62, 81 - 84. PREPARED BY: W. Gerrard VARIABLES: T/K: 298.15 - 323.15**EXPERIMENTAL VALUES:** Ostwald Mol Fraction T/K Coefficient $X_{1} \times 10^{2}$ L 6.52 298.15 1.97 1,54 5.23 310.15 5.47 1.57 323.15 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = -7,050.2 + 56.694$ Std. Dev. $\Delta G^{\circ} = 198$, Coef. Corr. = 0.9634 $\Delta H^{\circ}/J \mod^{-1} = -7,050.2$, $\Delta S^{\circ}/J K^{-1} \mod^{-1} = -56.694$ Smoothed Data: ∆G°/J mol⁻¹ T/K Mol Fraction $X_1 \times 10^2$ 9,853.6 1.88 298.15 10,137 1.79 303.15 308.15 1.71 10,420 10,704 313.15 1.64 318.15 1.57 10,987 11,271 323.15 1.51 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: The concentration of radon was Radon. determined by measurement of radio-1. activity in samples withdrawn from the liquid and from the gas phases. 2. Propanoic Acid. Eastman Chemical Co. Highest Grade. The procedure was stated to be similar in principle to that of Boyle (1). ESTIMATED ERROR: APPARATUS / PROCEDURE : A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium iodide scintillation counter. **REFERENCES:** Boyle, R. W. 1. Phil. Mag. 1911, 22, 840. See the evaluation on page 294 for the tentative recommendation of thermodynamic and solubility values.

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.	
2. 2-Propenoic Acid (Acrylic Acid); $C_{3H_4O_2}$ (CH ₂ =CHCO ₂ H); 79-10-7		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
T/K: 310.15	W. Gerrard	
EXPERIMENTAL VALUES:		
T/K Mol Fraction Ostwald		
$\begin{array}{c} \text{Coefficient} \\ \text{X}_1 \times 10^2 \\ \text{L} \end{array}$		
310.15 1.35		
	5.01	
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure.		
The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
AUXILIARY	INFORMATION	
METHOD: The concentration of radon was determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	<pre>SOURCE AND PURITY OF MATERIALS; 1. Radon-222. 2. Acrylic Acid. Eastman Chemical Company. Highest grade.</pre>	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:	
A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a		
sodium iodide scintillation counter.	REFERENCES:	
	<pre>1. Boyle, R. W. Phil. Mag. 1911, 22, 840.</pre>	

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²₈₆Rn; 14859-67-7 Hofbauer, G. 1. 2-Methyl Propanoic Acid; C4H802; 2. Sitzungsber. Akad. Wiss. Wien, Math. Naturwiss. Kl. Abt. 2A 1914, 123, 2001. 79-31-2 VARIABLES: PREPARED BY: T/K: 293.05 W. Gerrard **EXPERIMENTAL VALUES:** T/K Mol Fraction Ostwald $x_1 \times 10^2$ Coefficient L 293.05 9.18 0.0346 The author reported a coefficient of solubility, a', based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coef-ficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa. The mole fraction solubility at a radon partial pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. AUXILIARY INFORMATION METHOL/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: The method was based on the tech-1. Radon. nique of Kofler (1,2). The radon radioactivity was measured in both 2. Methyl Propanoic Acid. Purified by distillation. The density was given. the liquid and gaseous phases. The apparatus consists of two glass bulbs connected by a tap. Each bulb carries two separate taps. Both DATA CLASS: Hofbauer and Kofler give a diagram. ESTIMATED ERROR: **REFERENCES:** Kofler, M. 1. Sitzungsber. Akad. Wiss. Wien <u>1912, 121, 2169.</u> 2. Kofler, M. Monatsh. 1913, 34, 389.

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² Rn; 14859-67-7 86	Hofbauer, G.	
2. Butanoic Acid; C ₄ H ₈ O ₂ ; 107-92-6	<u>Sitzungsber. Akad. Wiss. Wien</u> , <u>Math. Naturwiss. Kl. Abt</u> . 2A 1914, <u>123</u> , 2001.	
VARIABLES:	PREPARED BY:	
т/К: 293.05	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Fra	ction Ostwald	
$\frac{x_1 x}{x_1 x}$		
293.05 3.2	8 8.78	
The author reported a coefficient of solubility, α' , based on the radon concentration ratio in the liquid and gaseous phases at equilibrium by radioactivity. The coefficient of solubility is labelled an Ostwald coefficient above. It was measured at a radon partial pressure of probably less than 0.1 kPa at equilibrium. The liquid was also saturated with air as a carrier gas at an initial pressure of about 100 kPa. The mole fraction solubility at a radon partial pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
	INFORMATION	
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
The method was based on the tech- nique of Kofler (1,2). The radon	1. Radon.	
radioactivity was measured in both the liquid and gaseous phases. The apparatus consists of two glass	 Butanoic Acid. Purified by distillation. The density was given. 	
bulbs connected by a tap. Each bulb carries two separate taps. Both		
Hofbauer and Kofler give a diagram.	DATA CLASS:	
	ESTIMATED ERROR:	
	REFERENCES :	
	<pre>1. Kofler, M. Sitzungsber. Akad. Wiss. Wien 1912, 121, 2169.</pre>	
	2. Kofler, M. <u>Monatsh</u> . 1913, <u>34</u> , 389.	

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COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²Rn; 14859-67-7 Nussbaum, E.; Hursh, J. B. 1. Butanoic Acid; C₄H₈O₂; 107-92-6 2. J. Phys. Chem. 1958, 62, 81 - 84. VARIABLES: PREPARED BY: T/K: 298.15 - 323.15 W. Gerrard **EXPERIMENTAL VALUES:** Ostwald T/K Mol Fraction Coefficient $X_1 \times 10^2$ L 2.78 7.52 298.15 6.82 310.15 2.46 5.99 2.11 323.15 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln X_1 = - 8,862.9 + 59.467 T$ Std. Dev. AG° = 23, Coef. Corr. = 0.9995 $\Delta H^{\circ}/J \text{ mol}^{-1} = -8,862.9, \Delta S^{\circ}/J K^{-1} \text{ mol}^{-1} = -59.467$ Mol Fraction $X_1 \times 10^2$ ∆G°/J mol-l T/K 298.15 2.80 8,867.2 2.64 9,164.6 303.15 2.49 9,461.9 308.15 9,759.3 313.15 2.36 318.15 2.23 10,057 10,354 323.15 2.12 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: The concentration of radon was 1. Radon-222. determined by measurement of radioactivity in samples withdrawn from 2. Butanoic Acid. Eastman Chemical the liquid and from the gas phases. The procedure was stated to be Company. Highest grade. similar in principle to that of Boyle (1). ESTIMATED ERROR: APPARATUS / PROCEDURE : A cylindrical glass vessel with a stopcock at each end. The gammarays emitted were estimated by a sodium iodide scintillation counter. REFERENCES: 1. Boyle, R. W. Phil. Mag. 1911, 22, 840.

COMPONENTS :		
	ORIGINAL MEASUREMENTS:	
1. Radon; $\frac{222}{86}$ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.	
2. Pentanoic Acid (Valeric Acid); C ₅ H ₁₀ O ₂ ; 109-52-4		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 323.15	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Fract	tion Ostwald	
X1 × 10	Coefficient) ² L	
298.15 3.74		
310.15 2.89	6.82 6.06	
323.15 2.51		
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure.		
The mole fraction solubility of radon at a pressure of 101.325 kPa was cal- culated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT 1$	$x_1 = -12,679 + 70.021 \text{ T}$	
Std. Dev. $\Delta G^\circ = 86.9$, Coef. Corr. = 0.9951 79, ∆S°/J K ⁻¹ mol ⁻¹ = -70.021	
T/K Mol Fraction $\Delta G^{\circ}/J \mod^{-1}$ X ₁ x 10 ²		
298.15 3.66	8,198.1	
303.15 3.37 308.15 3.10	8,898.3	
313.15 2.87	9,248.4	
318.15 2.65 323.15 2.47		
The smoothed data fit was added by t	he Volume Editor.	
AUXILIARY	INFORMATION	
ME THOD:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon was determined by measurement of radio-	1. Radon-222.	
activity in samples withdrawn from	0 Welewie Leid Destmon Chemisel	
the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	2. Valeric Acid. Eastman Chemical Company. Highest grade.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:	
A cylindrical glass vessel with a stopcock at each end. The gamma-		
rays emitted were estimated by a sodium iodide scintillation counter.	REFERENCES :	
Source Scintillation counter.	1. Boyle, R. W. <u>Phil. Mag.</u> 1911, <u>22</u> , 840.	
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COMPONENTS:	OPTOTNAL AR A CUPTARINE .	
	ORIGINAL MEASUREMENTS:	
l. Radon; ²²² Rn; 14859-67-7 86	Nussbaum, E.; Hursh, J. B.	
2. Hexanoic Acid; C ₆ H ₁₂ O ₂ ; 142-62-1		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 323.15	W. Gerrard May 1977	
EXPERIMENTAL VALUES:	tion Ostwald	
X1 X 1	Coefficient	
298.15 4.47		
310.15 3.50 323.15 <u>2.92</u>		
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was cal- culated by the compiler. It was assumed that the Ostwald coefficient was		
independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT 1$	$n X_1 = -13,590 + 71.513 T$	
Std. Dev. ∆G° = 47.1 ∆H°/J mol ⁻¹ = -13,59	, Coef. Corr. = 0.9986 0, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -71.513$	
T/K Mol Fraction $\Delta G^{\circ}/J \text{ mol}^{-1}$ X ₁ x 10 ²		
298.15 4.42	7,732.2	
303.15 4.04 308.15 3.70	•	
313.15 3.40	8,804.9	
318.15 3.13 323.15 2.89	9,162.5 9,520.0	
The smoothed data fit was added by t		
AUXILIARY	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon was	1. Radon-222.	
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	2. Hexanoic Acid. Eastman Chemical Company. Highest grade.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:	
A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a		
sodium iodide scintillation counter.	REFERENCES :	
	<pre>1. Boyle, R. W. Phil. Mag. 1911, 22, 840.</pre>	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Nussbaum, E.; Hursh. J. B.	
2. Heptanoic Acid; C ₇ H ₁₄ O ₂ ; 111-14-8		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
т/к: 298.15 - 323.15	W. Gerrard	
EXPERIMENTAL VALUES: T/K MOl Fract:	ion Ostwald	
$x_1 \times 10^{-1}$	Coefficient 2 L	
$\frac{1}{298.15}$ 4.87		
310.15 3.90	7.15	
323.15 3.38	6.33	
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure.		
The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = -RT \ln Std. Dev. \Delta G^{\circ} = 58.7,$	$x_1 = -11,640 + 64.285 T$ Coef. Corr. = 0.9975 , $\Delta S^{\circ}/J K^{-1} mol^{-1} = -64.285$	
T/K Mol Fract X ₁ x 10	ion \G°/J mol ⁻¹ 2	
298.15 4.80 303.15 4.44		
303.15 4.44 308.15 4.12		
313.15 3.83	8490.7	
318.15 3.57 323.15 3.34	8812.1 9133.4	
The smoothed data fit was added by the		
AUXILIARY	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon was determined by measurement of radio-	1. Radon-222.	
activity in samples withdrawn from		
the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	 Heptanoic Acid. Eastman Chemical Company. Highest grade. 	
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE:		
A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium		
iodide scintillation counter.	REFERENCES :	
	l. Boyle, R. W. <u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840.	

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²22₈₆Rn; 14859-67-7 Nussbaum, E.; Hursh, J. B. 1. 2. Octanoic Acid, C₈H₁₆O₂; 124-07-2 J. Phys. Chem. 1958, 62, 81 - 84. VARIABLES : PREPARED BY: T/K: 298.15 - 323.15 W. Gerrard **EXPERIMENTAL VALUES:** TZK Mol Fraction Ostwald Coefficient $x_1 \times 10^2$ Ľ 5.59 9.03 298.15 310.15 4.20 6.89 6.16 323.15 3.67 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 $\rm cm^3$ at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_1 = -13,354 + 68.995 T$ Std. Dev. $\Delta G^{\circ} = 112$, Coef. Corr. = 0.9916 $\Delta H^{\circ}/J \mod^{-1} = -13,354, \Delta S^{\circ}/J K^{-1} \mod^{-1} = -68,995$ ∆G°/J mol⁻¹ T/K Mol Fraction $X_1 \times 10^2$ 5.44 7,217.1 298.15 7,562.0 4.98 303.15 308.15 4.57 7,907.0 4.20 8,252.0 313.15 318.15 3.88 8,597.0 3.59 8,941.9 323.15 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: The concentration of radon was 1. Radon-222. determined by measurement of radioactivity in samples withdrawn from 2. Octanoic Acid. Eastman Chemical the liquid and from the gas phases. The procedure was stated to be Company. Highest grade. similar in principle to that of Boyle (1). **ESTIMATED ERROR: APPARATUS / PROCEDURE :** A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium iodide scintillation counter. REFERENCES : Boyle, R. W. 1. Phil. Mag. 1911, 22, 840.

COMPONENTS :	ORIGINAL MEASUREMENTS:	
1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.	
2. Nonanoic Acid; C ₉ H ₁₈ O ₂ ; 112-05-0		
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
т/к: 298.15 - 323.15	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Fract	ion Ostwald Coefficient	
X ₁ × 10		
298.15 5.67	8.32	
310.15 4.61 323.15 3.945	6.89 6.00	
The Ostwald coefficient was measured radon. The carrier gas was nitrogen The liquid was therefore saturated wi pressure. The mole fraction solubility of radon	at a partial pressure of about 100 kPa. th nitrogen at the experimental	
calculated by the compiler. It was a	ssumed that the Ostwald coefficient was gram-mole volume of radon is 22,290 cm ³	
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln$	$X_1 = -11,584 + 62.791 T$	
Std. Dev. ∆G° = 38.0, ∧H°/J mol ⁻¹ = -11.584	Coef. Corr. = 0.9990 , $\Delta S^{\circ}/J K^{-1} mol^{-1} = -62.791$	
	tion $\Delta G^{\circ}/J \mod^{-1}$	
$x_1 \times 10^2$		
298.15 5.62 303.15 5.20		
308.15 4.83 313.15 4.49		
318.15 4.19	8,392.8	
323.15 3.91	8,706.6	
The smoothed data fit was added by the Volume Editor.		
AUXILIARY	INFORMATION	
METHOD: The concentration of radon was	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.	
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be simi- lar in principle to that of Boyle (1)	2. Nonanoic Acid. Eastman Chemical Company. Highest grade.	
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE:	CONTRACED ERROR;	
A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium		
iodide scintillation counter.	REFERENCES: 1. Boyle, R. W. <u>Phil. Mag</u> . 1911, <u>22</u> , 840.	

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.	
2. Decanoic Acid; C ₁₀ H ₂₀ O ₂ ; 334-48-5		
	<u>J. Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
т/к: 310.15	W. Gerrard	
EXPERIMENTAL VALUES:	ion Ostwald	
T/K Mol Fract	Coefficient	
$\frac{X_1 \times 10}{310.15}$	<u>L</u> 7.13	
j		
The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure.		
The mole fraction solubility of radon calculated by the compiler. It was a independent of pressure and that the at 273.15 K and 101.325 kPa.	at a pressure of 101.325 kPa was ssumed that the Ostwald coefficient was gram-mole volume of radon is 22,290 cm ³	
AUXILIARY	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon was	1. Radon-222.	
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be	 Decanoic Acid. Eastman Chemical Company. Highest grade. 	
similar in principle to that of Boyle (1).		
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE: A cylindrical glass vessel with a		
stopcock at each end. The gamma-rays emitted were estimated by a sodium		
iodide scintillation counter.	REFERENCES:	
	1. Boyle, R. W. <u>Phil. Mag. 1911, 22, 840.</u>	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² 86Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.
2. Undecanoic Acid; C ₁₁ H ₂₂ O ₂ ; 112-37-8	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81-84.
VARIABLES:	PREPARED BY:
T/K: 310.15	W. Gerrard
EXPERIMENTAL VALUES:	
T/K Mol Fract	
x ₁ × 10	2 Coefficient 2 L
310.15 5.34	6.86
The Ostwald coefficient was measured radon. The carrier gas was nitrogen The liquid was therefore saturated wi pressure.	at a partial pressure of about 100 kPa.
The mole fraction solubility of radon calculated by the compiler. It was a independent of pressure and that the at 273.15 K and 101.325 kPa.	at a pressure of 101.325 kPa was ssumed that the Ostwald coefficient was gram-mole volume of radon is 22,290 cm ³
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
	1. Radon-222.
The concentration of radon was determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	2. Undecanoic Acid. Eastman Chemical Company. Highest grade.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
A cylindrical glass vessel with a stopcock at each end. The gamma-rays	
emitted were estimated by a sodium iodide scintillation counter.	REFERENCES :
Tourse sernerration councer.	1. Boyle, R. W. <u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840.

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COMPONENTS:	ORIGINAL MEASUREMENTS:	
l. Radon; ²²² Rn; 14859-67-7 86	Nussbaum, E.; Hursh, J. B.	
 Dodecanoic Acid (Lauric Acid); C₁₂H₂₄O₂; 143-07-7 		
	J. Phys. Chem. 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
т/к: 323.15	W. Gerrard	
EXPERIMENTAL VALUES: T/K Mol Frac		
X, x 1	Coefficient 0 ² L	
ان الله الله الله الله الله الله الله ال		
323.15 4.93		
The Ostwald coefficient was measured radon. The carrier gas was nitrogen The liguid was therefore saturated wi pressure.	at a partial pressure of about 100 kPa.	
The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
The concentration of radon was	1. Radon-222.	
determined by measurement of radio- activity in samples withdrawn from	2. Lauric Acid. Eastman Chemical	
the liquid and from the gas phases. The procedure was stated to be	Co. Highest grade.	
similar in principle to that of		
Boyle (1).		
	ESTIMATED ERROR:	
APPARATUS/PROCEDURE:		
A cylindrical glass vessel with a stopcock at each end. The gamma-rays		
emitted were estimated by a sodium iodide scintillation counter.	REFERENCES:	
Tourde Scincifiación Councer.		
	1. Boyle, R. W. Phil. Mag. 1911, 22, 840.	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7 86	Nussbaum, E; Hursh, J. B.
2. Tridecanoic Acid; C ₁₃ H ₂₆ O ₂ ; 638-53-9	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81 - 84.
VARIABLES: T/K: 323.15	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Fract.	ion Ostwald
x, x 10	Coefficient
$\frac{1}{323.15}$ 5.28	5.95
The liquid was therefore saturated wi pressure. The mole fraction solubility of radon	at a partial pressure of about 100 kPa. th nitrogen at the experimental at a pressure of 101.325 kPa was
calculated by the compiler. It was a independent of pressure and that the at 273.15 K and 101.325 kPa.	ssumed that the Ostwald coefficient was gram-mole volume of radon is 22,290 cm ³
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon was	1. Radon-222.
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	2. Tridecanoic Acid. Eastman Chemi- Cal Co. Highest grade.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
A cylindrical glass vessel with a	
stopcock at each end. The gamma-rays emitted were estimated by a sodium	REFERENCES:
iodide scintillation counter.	1. Boyle, R. W. <u>Phil</u> . <u>Mag</u> . 1911, <u>22</u> , 840.

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²Rn; 14859-67-7 Nussbaum, E.; Hursh, J. B. 1. (ZZ)-9,12- Octadecadienoic Acid 2. (Linoleic Acid); C₁₈H₃₂O₂; 60-33-3 J. Phys. Chem. 1958, 62, 81 - 84. VARIABLES: PREPARED BY: т/к: 298.15 - 323.15 W. Gerrard **EXPERIMENTAL VALUES:** T/K Mol Fraction Ostwald Coefficient $x_1 \times 10^2$ \mathbf{L} 7.96 298.15 9.27 7.30 6.32 323.15 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm^3 at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln X_{1} = -15,307 + 71.114 T$ $\Delta H^{\circ}/J \text{ mol}^{-1} = -15,307, \quad \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -71.114$ ∆G°/J mol⁻¹ T/K Mol Fraction $x_1 \times 10^2$ 9.27 5,895.8 298.15 6,251.4 303.15 8.37 6,606.9 308.15 7.59 6.90 6,962.5 313.15 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: 1. Radon-222. The concentration of radon was determined by measurement of radio-2. Linoleic Acid. Eastman Chemical activity in samples withdrawn from the liquid and from the gas phases. Co. Highest grade. The procedure was stated to be similar in principle to that of Boyle (1). ESTIMATED ERROR: APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium **REFERENCES:** iodide scintillation counter. Boyle, R. W. 1. Phil. Mag. 1911, 22, 840.

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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² Rn; 14859-67-7 86	Nussbaum, E.; Hursh, J. B.
2. (Z)-9-Octadecenoic Acid (Oleic Acid); C ₁₈ H ₃₄ O ₂ ; 112-80-1	
	<u>J. Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 81 - 84.
VARIABLES:	PREPARED BY:
т/к: 298.15 - 323.15	W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Fract	
X ₁ x 10	Coefficient 2 L
298.15 9.59	
310.15 7.85	6.72
323.15 6.73	5.86
The liquid was therefore saturated wi pressure.	at a partial pressure of about 100 kPa. th nitrogen at the experimental
The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient wa independent of pressure and that the gram-mole volume of radon is 22,290 cm at 273.15 K and 101.325 kPa.	
Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = - RT \ln I$	
Std. Dev. ΔG° = 34.4,	Coef. Corr. = 0.9989
$\Delta H^{\circ}/J \text{ mol}^{-1} = -11,308$, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -57.489$
T/K Mol Fraction $\Delta G^{\circ}/J \mod 1$ $X_1 \times 10^2$	
298.15 9.51 5,832.3 303.15 8.82 6,119.8	
303.15 8.82 308.15 8.20	
313.15 7.64 318.15 7.14	
323.15 6.68	7,269.5
The smoothed data fit was added by th	e Volume Editor.
AUXILIARY	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon was	1. Radon-222.
determined by measurement of radio- activity in samples withdrawn from	2. Oleic Acid. Eastman Chemical Co.
The liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).	Highest grade.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
A cylindrical glass vessel with a	
stopcock at each end. The gamma-rays	REFERENCES :
emitted were estimated by a sodium iodide scintillation counter.	<pre>REFERENCES: 1. Boyle, R. W. <u>Phil. Mag. 1911, 22, 840.</u></pre>

COMPONENTS:1. Radon; ${}^{222}_{86}$ Rn; 14859-67-7ORIGINAL MEASUREMENTS:2. Acetic Acid Ethyl Ester (Ethyl Acetate); $C_4H_8O_2$; 141-78-6Ramstedt, E.VARIABLES: T/K: 255.15 - 291.15Le Radium 1911, 8, 253-256.VARIABLES: T/K: 255.15 - 291.15WARIABLES: T/K: 255.15 - 291.15VARIABLES: T/K MOI Fraction Ostwald 273.15 3.879.41 291.15 2.93The Ostwald coefficient was measured at a radon partial pressure of les than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.	
2. Acetic Acid Ethyl Ester (Ethyl Acetate); $C_4H_8O_2$; 141-78-6 VARIABLES: T/K: 255.15 - 291.15 EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald Coefficient $\frac{X_1 \times 10^2}{255.15 - 5.74}$ The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
Acetate); $C_4H_8O_2$; 141-78-6 VARIABLES: T/K: 255.15 - 291.15 EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald $\frac{X_1 \times 10^2}{255.15 - 291.15}$ W. Gerrard M. Gerrard $\frac{X_1 \times 10^2}{13.6}$ 273.15 3.87 9.41 291.15 2.93 7.35 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
T/K: 255.15 - 291.15 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald $\frac{X_1 \times 10^2}{255.15 - 5.74}$ Ostwald $\frac{X_1 \times 10^2}{13.6}$ 273.15 3.87 9.41 291.15 2.93 7.35 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
T/K: 255.15 - 291.15 T/K: 255.15 - 291.15 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald $X_1 \times 10^2$ Coefficient $\frac{X_1 \times 10^2}{13.6}$ 273.15 3.87 9.41 291.15 2.93 7.35 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
EXPERIMENTAL VALUES:T/KMol FractionOstwald Coefficient L $\frac{X_1 \times 10^2}{255.15}$ $\frac{5.74}{5.74}$ $\frac{13.6}{13.6}$ 273.15 273.15 3.87 9.41 291.15 2.93 7.35 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa.The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
EXPERIMENTAL VALUES: $T/K Mol \; Fraction Ostwald \\ $	
The Ostwald coefficient was measured at a radon partial pressure of les than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
255.155.7413.6273.153.879.41291.152.937.35The Ostwald coefficient was measured at a radon partial pressure of lesthan 0.1 kPa at equilibrium. The radon was present in a carrier gas (anitrogen) at an initial pressure of about 101 kPa.The mole fraction solubility was calculated by the compiler. It was asthat the Ostwald coefficient was independent of pressure and that the grant fraction solubility was calculated by the compiler.	
255.155.7413.6273.153.879.41291.152.937.35The Ostwald coefficient was measured at a radon partial pressure of lesthan 0.1 kPa at equilibrium. The radon was present in a carrier gas (anitrogen) at an initial pressure of about 101 kPa.The mole fraction solubility was calculated by the compiler. It was asthat the Ostwald coefficient was independent of pressure and that the g	
291.15 2.93 7.35 The Ostwald coefficient was measured at a radon partial pressure of les than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
The Ostwald coefficient was measured at a radon partial pressure of les than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
than 0.1 kPa at equilibrium. The radon was present in a carrier gas (a nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	
The mole fraction solubility was calculated by the compiler. It was as that the Ostwald coefficient was independent of pressure and that the g	ir or
that the Ostwald coefficient was independent of pressure and that the g	
	ram-
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -11,510 + 68.977 T$	
Std. Dev. $\Delta G = 47.0$, Coef. Corr. = 0.9993	
$\Delta H^{\circ}/J \text{ mol}^{-1} = -11,510, \Delta S^{\circ}/J K^{-1} \text{ mol}^{-1} = -68.977$	
T/K Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$	
$x_1 \times 10^2$	
<u> </u>	
263.15 4.81 6,641.3	
263.15 4.81 6,641.3 268.15 4.36 6,986.1 273.15 3.96 7,331.0	
278.15 3.62 7,675.9	
283.15 3.31 8,020.8	
293.15 2.80 8,710.6	
298.15 2.59 9,055.5	
The smoothed data fit was added by the Volume Editor.	
AUXILIARY INFORMATION	
METHOD: SOURCE AND PURITY OF MATERIALS:	
Measurement of radioactivity in 1. Radon-222.	
the liquid and in the gaseous phase. 2. Acetic Acid Ethyl Ester.	
Dried and distilled.	
APPARATUS/PROCEDURE: ESTIMATED ERROR:	
Two tubes connected by a wide tap.	
To determine concentration of radon, each tube is placed in a condenser.	
DEPEDDING	
REFERENCES:	<u>.</u>
REFERENCES :	
REFERENCES:	<u></u>
REFERENCES :	
REFERENCES :	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Lurie, A.
80	Thesis University of Grenoble, 1910
2. Acetic Acid Pentyl Ester (Amyl Acetate); C ₇ H ₁₄ O ₂ ; 628-63-7	Microfilm available.
/ 14 2	See also Tables annuelles de con- stantes et donnees numeriques de
	chemie, de physique et de technologie
	1913 (for 1911), 2, 401.
VARIABLES:	PREPARED BY:
т/к: 253.15 - 343.15	W. Gerrard
EXPERIMENTAL VALUES:	
T/K Mol Frac	ction Ostwald
x ₁ × 1	10 ² Coefficient
253.15 -	39.5
273.15 11.5	19.4
293.15 8.56 323.15 -	
323.15 - 343.15 ~	7.2 4.8
	····
The author reported a coefficient of a the same meaning as the ratio of conce in the liquid/concentration of radon is absorption has been labelled as the Os	entrations: concentration of radon In the gas. The coefficient of
The coefficient of absorption was measuless than 0.1 kPa at equilibrium. The (air or nitrogen) at an initial pressu	e radon was present in a carrier gas
It was assumed that the Ostwald coeff: and that the gram-mole volume of rado 101.325 kPa.	
AUXILIARY	INFORMATION
	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS:
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Acetic Acid Pentyl Ester (Amyl Acetate). Purity of liquid
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Acetic Acid Pentyl Ester (Amyl Acetate). Purity of liquid
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Acetic Acid Pentyl Ester (Amyl Acetate). Purity of liquid not specified.
	 SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Acetic Acid Pentyl Ester (Amyl Acetate). Purity of liquid not specified.
METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	 SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Acetic Acid Pentyl Ester (Amyl Acetate). Purity of liquid not specified.

COMPONENTS:	ORIGINAL MEASUREMENTS:	
	Nussbaum, E.; Hursh, J. B.	
l. Radon; ² 22 86 ^{Rn} ; 14859-67-7	Nusspaum, 1., nuton, 0. D.	
<pre>2. 1,2,3-Propanetriol, Triacetate (Triacetin); C₉H₁₄O₆; 102-76-1</pre>		
	<u>J</u> . <u>Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 81 - 84.	
VARIABLES:	PREPARED BY:	
T/K: 298.15 - 310.15	W. Gerrard	
EXPERIMENTAL VALUES:		
T/K Mol Fracti		
$x_{1} \times 10^{2}$	2 Coefficient L	
298.15 2.22 310.15 2.13	3.42 2.88	
The liquid was therefore saturated with pressure.	at a partial pressure of about 100 kPa. th nitrogen at the experimental	
independent of pressure and that the orac at 273.15 K and 101.325 kPa.	gram-mole volume of radon is 22,290 cm ³	
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln$ $\Delta H^{\circ}/J \mod^{-1} = -2,651.5$	$X_1 = -2,651.5 + 40.551 T$ 5, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -40.551$	
$\frac{11}{T/K} \frac{Mol \ Fraction}{X_1 \ x \ 10^2} Mol^{-1}$		
$\frac{n_1 + 10}{298.15}$	9,438.8	
303.15 2.18	9,641.6	
308.15 2.14 313.15 2.11	9,844.4 10,047	
The smoothed data fit was added by the Volume Editor.		
AUXILIARY INFORMATION		
METHOD:	SOURCE AND PURITY OF MATERIALS;	
The concentration of radon was	1. Radon-222.	
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of	2. Triacetin. Eastman Chemical Company. Highest grade.	
Boyle (1).		
APPARATUS/PROCEDURE:	ESTIMATED ERROR:	
A cylindrical glass vessel with a		
stopcock at each end. The gamma-rays emitted were estimated by a sodium	REFERENCES :	
iodide scintillation counter.	<pre>LIERENCES: 1. Boyle, R. W. Phil. Mag. 1911, 22, 840.</pre>	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.
 Butanoic Acid, 1,2,3-propanetri ester (Tributyrin); C₁₅H₂₆O₆; 60-01-5 	yl
80-0I-3	J. Phys. Chem 1958, 62, 81 - 84.
VARIABLES:	PREPARED BY:
T/K: 298.15 - 323.15	W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Fra	ction Ostwald Coefficient
X ₁ x	10 ² L
298.15 7.1 310.15 5.5	
The Ostwald coefficient was measure	d at a very low partial pressure of n at a partial pressure of about 100 kPa
calculated by the compiler. It was independent of pressure and that th at 273.15 K and 101.325 kPa.	on at a pressure of 101.325 kPa was assumed that the Ostwald coefficient was a gram-mole volume of radon is 22,290 cr
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT$	
	18, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -77.908$
T/K Mol Fr X ₁ x	raction $\Delta G^{\circ}/J$ mol ⁻¹ : 10 ²
	19 6,525.7
308.15 5.	43 6,915.2 78 7,304.8
	21 7,694.3 the Volume Editor.
AUXILIA	RY INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
	1. Radon-222.
The concentration of radon was determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be	2. Tributyrin. Eastman Chemical Co
similar in principle to that of Boyle (1).	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
A cylindrical glass vessel with a stopcock at each end. The gamma-ra	1
A cylindrical glass vessel with a	a ays
A cylindrical glass vessel with a stopcock at each end. The gamma-ra emitted were estimated by a sodium	1

COMPONENTS: **ORIGINAL MEASUREMENTS:** Radon; ²²²₈₆Rn; 14859-67-7 Nussbaum, E.; Hursh, J. B. 1. Hexanoic acid; 1,2,3-propanetriyl 2. ester (Trihexanoin); C₂₁H₃₈O₆; 621-70-5 J. Phys. Chem. 1958, 62, 81 - 84. VARIABLES: PREPARED BY: т/к: 298.15 - 323.15 W. Gerrard **EXPERIMENTAL VALUES:** T/K Ostwald Mol Fraction Coefficient $X_1 \times 10^2$ T. 7.25 298.15 10.5 8.75 6.10 310.15 7.34 5.17 323.15 The Ostwald coefficient was measured at a very low partial pressure of radon. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 $\rm cm^3$ at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{\circ}/J \text{ mol}^{-1} = -RT \ln X_1 = -11,467 + 57.208$ Std. Dev. $\Delta G^{\circ} = 4.9$, Coef. Corr. = 0.9999 $\Delta H^{\circ}/J \text{ mol}^{-1} = -11,467, \Delta S^{\circ}/J K^{-1} \text{ mol}^{-1} = -57.208$ $\Delta G^{\circ}/J \text{ mol}^{-1}$ Mol Fraction T/K $x_1 \times 10^2$ The smoothed data fit was added by 10.5 5,589.9 298.15 the Volume Editor. 5,875.9 303.15 9.72 308.15 9.03 6,161.9 6,448.0 6,734.0 313.15 8.40 318.15 7.84 323.15 7.33 7,020.1 AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: The concentration of radon was 1. Radon-222. determined by measurement of radioactivity in samples withdrawn from 2. Trihexanoin. Eastman Chemical Co. Highest Grade. the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1).ESTIMATED ERROR: **APPARATUS / PROCEDURE :** A cylindrical glass vessel with a stopcock at each end. The gamma-rays emitted were estimated by a sodium iodide scintillation counter. **REFERENCES:** 1. Boyle, R. W. Phil. Mag. 1911, 22, 840.

COMPONENTS :	ORIGINAL MEASUREMENTS:
COMPONENTS.	ORIGINAL MEASUREMENTS:
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Nussbaum, E.; Hursh, J. B.
<pre>2. Octanoic acid; 1,2,3-propanetriyl ester (Trioctanoin); C₂₇H₅₀O₆; 538-23-8</pre>	<u>J. Phys</u> . <u>Chem</u> . 1958, <u>62</u> , 81 - 84.
VARIABLES:	PREPARED BY:
т/к: 298.15 - 323.15	W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Fract	
X ₁ × 10	2 Coefficient L
$\frac{n_1 + 10}{298.15}$ 13.3	7.55
310.15 10.8	6.12
323.15 9.8	5.63
The liquid was therefore saturated wi pressure.	at a partial pressure of about 100 kPa. th nitrogen at the experimental
The mole fraction solubility of radon calculated by the compiler. It was a independent of pressure and that the at 273.15 K and 101.325 kPa.	at a pressure of 101.325 kPa was ssumed that the Ostwald coefficient was gram-mole volume of radon is 22,290 cm ³
Smoothed Data: $\Delta G^{\circ}/J \mod^{-1} = -RT \ln$	
	Coef. Corr. = 0.9912
· · · · · · · · · · · · · · · · · · ·	1, $\Delta S^{\circ}/J K^{-1} mol^{-1} = -49.440$
T/K Mol Frac X ₁ x 1	tion $\Delta G^{\circ}/J \text{ mol}^{-1}$
298.15 13.0	5,050.5
303.15 12.2 308.15 11.5	5,297.7 5,544.9
313.15 10.8	5,792.1
318.15 10.2 323.15 9.63	6,039.4 6,286.6
The smoothed data fit was added by th	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon was	1. Radon-222.
determined by measurement of radio- activity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of	 Trioctanoin. Eastman Chemical Co. Highest grade.
Boyle (1).	
	ESTIMATED ERROR:
APPARATUS/PROCEDURE:	
A cylindrical glass vessel with a stopcock at each end. The gamma-rays	
emitted were estimated by a sodium iodide scintillation counter.	REFERENCES :
Tourde Scincillation counter.	<pre>1. Boyle, R. W. <u>Phil</u>. <u>Mag</u>. 1911, <u>22</u>, 840.</pre>

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon; ²²² ₈₆ Rn; 14859-67-7	Ramstedt, E.
<pre>2. Trichloromethane (Chloroform); CHCl₃; 67-66-3</pre>	Le Radium 1911, <u>8</u> , 253-256.
VARIABLES:	PREPARED BY:
T/K: 255.15 - 291.15	W. Gerrard
EXPERIMENTAL VALUES: T/K Mol Frac	ction Ostwald
2,	L0 ² Coefficient L
255.15 9.18 273.15 6.71	28.5 20.5
291.15 4.83	15.08
The Ostwald coefficient was measured a	at a radon partial pressure of less
	on was present in a carrier gas (air or
nitrogen) at an initial pressure of al	
that the Ostwald coefficient was indep mole volume of radon is 22,290 cm ³ at	273.15 K and 101.325 kPa.
Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln \lambda$	$x_1 = -11,040 + 63.037 \text{ T}$
Std. Dev. ΔG = 37.8, G	Coef. Corr. = 0.9994
	$\Delta S^{O}/J K^{-1} mol^{-1} = -63.037$
	-
	action $\Delta G^{O}/J \text{ mol}^{-1}$
X ₁ x	10 ²
258.15 8.7	73 5,233.5
263.15 7.9	5,548.7
268.15 7.2	
	58 6,179.0 6 494 2
278.15 6.03 6,494.2 283.15 5.54 6,809.4	
288.15 5.1	1 7,124.6
293.15 4.7	
The smoothed data fit was added by the	79 7,755.0 A Volume Editor
	INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity in	1. Radon-222.
the liquid and in the gaseous phase.	
	2. Trichloromethane (Chloroform). Dried and distilled.
	biled and distilled.
1	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
In that to / thought the	
Two tubes connected by a wide tap.	
To determine concentration of radon,	
each tube is placed in a condenser.	REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon; ²²² Rn; 14859-67-7 86	Ramstedt, E.	
2. Carbon Disulfide; CS ₂ ; 75-15-0	Le <u>Radium</u> 1911, <u>8</u> , 253-256.	
VARIABLES: T/K: 255.15 - 291.15	PREPARED BY:	
1/1. 233.13 - 291.13	W. Gerrard	
EXPERIMENTAL VALUES:	tion Ostwald	
	0 ² Coefficient	
	<u> </u>	
255.15 12.2 273.15 8.10	33.4	
291.15 5.53	23.14	
The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram- mole volume of radon is 22,290 cm ³ at 273.15 K and 101.325 kPa.		
Smoothed Data: $\Delta G^{O}/J \mod^{-1} = -RT \ln X$	$x_1 = -13,584 + 70.696 \text{ T}$	
Std. Dev. $\Delta G = 15.9, C$	Coef. Corr. = 0.9999 $\Delta S^{0}/J K^{-1} mol^{-1} = -70.696$	
T/K MolFra X _l ×	$\Delta G^{O}/J \text{ mol}^{-1}$	
	4 4,665.8	
	1 5,019.2 The smoothed 98 5,372.7 data fit was	
273.15 8.	.03 5,726.2 added by the	
	22 6,079.7 Added by the 50 6,433.2 Volume Editor.	
288.15 5.	88 6,786.6	
	.34 7,140.1 87 7,493.6	
	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
Measurement of radioactivity in	1. Radon-222.	
the liquid and in the gaseous phase.		
	2. Carbon Disulfide. Dried and distilled.	
	ESTIMATED ERROR:	
APPARATUS / PROCEDURE :	LOTIMIED ERKOR:	
Two tubes connected by a wide tap. To determine concentration of radon,		
each tube is placed in a condenser.		
	REFERENCES :	
The mole fraction solubilities calculated above are for a radon partial pressure of 101.325 kPa.		
	L	

COMPONENTS: ORIGINAL MEASUREMENTS: Radon; ²²²₈₆Rn; 14859-67-7 1. Ramstedt, E. Benzenamine (Aniline); C₆H₇N; 2. 62-53-3 Le Radium 1911, 8, 253-356. VARIABLES: PREPARED BY: T/K: 273.15 - 291.15 W. Gerrard EXPERIMENTAL VALUES: T/K Mol Fraction Ostwald Coefficient $X_1 \times 10^2$ L 273.15 1.75 4.43 291.15 1.44 3.80 The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa. The mole fraction solubility was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. Smoothed Data: $\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -7162.2 + 59.857 T$ $\Delta H^{\circ}/J \text{ mol}^{-1} = -7,162.2, \Delta S^{\circ}/J \text{ K}^{-1} \text{ mol}^{-1} = -59.857$ Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ T/K $x_1 \times 10^2$ 273.15 1.75 9,187.7 278.15 1.65 9,486.9 283.15 1.57 9,786.2 288.15 1.48 10,086 293.15 1.41 10,385 298.15 1.34 10,684 The smoothed data fit was added by the Volume Editor. AUXILIARY INFORMATION SOURCE AND PURITY OF MATERIALS: METHOD: Measurement of radioactivity in 1. Radon-222. the liquid and in the gaseous phase. 2. Benzenamine. Dried and distilled. ESTIMATED ERROR: APPARATUS / PROCEDURE : Two tubes connected by a wide tap. To determine concentration of radon, each tube is placed in a condenser. **REFERENCES:** The mole fraction solubilities calculated above are for a radon partial pressure of 101.325 kPa.

COMPONENTS: 1. Radon-222; 222 86 ^{Rn} ; 14859-67-7	ORIGINAL MEASUREMENTS: Traubenberg, H.F.R.
2. Nitrobenzene; C ₆ H ₅ NO ₂ ; 98-95-3	Phys. Z. 1904, <u>5</u> , 130 - 134.
VARIABLES:	
VARIABLES.	PREPARED BY: W. Gerrard
	W. OCITATA
EXPERIMENTAL VALUES:	
	compared Ostwald water* Coefficient
wich v	L
"Room temperature" 1	8.06 5.42
*water was taken as 0.3	
The author reported his solubility va	lue as an absorption coefficient based
on the concentration ratio of radon in It has been labelled as an Ostwald co	n the gas and in the liquid phases.
measured at a radon partial pressure also saturated with air as a carrier	of less than 0.1 kPa. The liquid was
also saturated with all as a caller	jas at a pressure of about 100 krd.
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity.	Not stated.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
Electroscope for the measurement of	Traubenberg's values appear to be low when compared with values re-
radioactivity.	ported by other workers.
	REFERENCES:
h	k

EVALUATOR: COMPONENTS : Radon-222; ²²²₈₆Rn; 14859-67-7 1. William Gerrard Department of Chemistry The Polytechnic of North London 2. Petroleum Products Holloway, London N7 8DB U.K. May 1977 CRITICAL EVALUATION: Petroleum. There are three reports of the solubility of radon-222 in petroleum. Hofman's (1) values were based on a primitive electroscopic technique and are of doubtful accuracy. Lurie (2) cited Hofman's values and gave his own as being in approximate agreement. Traubenberg's (3) value appears to be much too small. Paraffin oil. There are three reports of the solubility of radon-222 in paraffin oil. Two of the reports give the temperature as only "room temperature." Schrodt's (4) value is too large and Traubenberg's (3) value is too small. Ramstedt's (5) values of the radon Ostwald coefficient at 273.15 and 291.15 K are classed as tentative. Petroleum ether. Traubenberg's (3) value is too small. REFERENCES. 1. Hofman, R. Phys. Z. 1905, 6, 339. 2. Lurie, A. Thesis 1910, University of Grenoble. 3. Traubenberg, H. F. R. Phys. Z. 1904, 5, 130. 4. Schrodt, O. Roentgenpraxis (Leipzig) 1938, 10, 743. 5. Ramstedt, E. Le Radium 1911, 8, 253.

COMPONENTS: 1. Radon-222; 222 86Rn; 14859-67-7	
1 Delen 000 6660- 14050 67 7	ORIGINAL MEASUREMENTS:
1. Radon-222; $\frac{222}{86}$ Rn; 14859-67-7	Lurie, A. Thesis
2. Petroleum.	University of Grenoble, 1910
z. recibieum.	Microfilm available.
	See also Tables annuelles de con- stantes et donnees numeriques de
	chemie, de physique et de technologie
	1913 (for 1911), 2, 401.
VARIABLES:	PREPARED BY:
	W. Gerrard
T/K: 255.15 - 333.15	
EXPERIMENTAL VALUES: T/K	Ostwald
17 K	Coefficient
	L
255.15	21.4
276.15	12.6
293.15 313.15	9.01 8.7
333.15	6.9
The author reported a coefficient of	absorption, α , which appears to have
the same meaning as the ratio of conc in the liquid/concentration of radon	
absorption has been labelled as the C	
The coefficient of absorption was mea less than 0.1 kPa at equilibrium. Th	
(air or nitrogen) at an initial press	
AUXILIAR	(INFORMATION
AUXILIAR METHOD/APPARATUS/PROCEDURE:	Y INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was	SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified.</pre>
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified.</pre>
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified.</pre>
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:
METHOD/APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Petroleum. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Hofmann, R.
2. Petroleum	
	<u>Phys.</u> Z. 1905, <u>6</u> , 339-340.
VARIABLES:	PREPARED BY:
	W. Gerrard
T/K: 255.15 - 333.15	
	l
EXPERIMENTAL VALUES: T/K	Ostwald
Co	Defficient L
255.15 276.15	22.7 12.87
293.15	9.55
313.15 333.15	8.13 7.01
	····
The author reported an Absorption coef	
the Ostwald coefficient. The coefficient partial pressure of less than 0.1 kPa a	
in a carrier gas (air or nitrogen) at a	
	-
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Determination of concentration of	No specific information.
radon in the gas and liquid phases by means of radioactivity.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
Electroscope, and glass containers	Of doubtful accuracy because
for measurement of radioactivity.	of the primitive electroscope technique.
	REFERENCES: 1. Traubenberg, H.F.R.
	<u>Phys. Z. 1904, 5, 130.</u>
	1

	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² 86Rn; 14859-67-7	Traubenberg, H. F. R.
2. Petroleum Products	
	<u>Phys</u> . <u>Z</u> . 1904, <u>5</u> , 130 - 134.
VARIABLES:	PREPARED BY:
T/K: "Room Temperature"	W. Gerrard

EXPERIMENTAL VALUES:

T/K	Ratio Compared With Water*	Ostwald Coefficient L
Petroleum		
Room Temperature	25.2	7.56
Paraffin C	0il	
Room Temperature	14.46	4.34
Petroleum	Ether	
Room Temperatu	re 16.19	4.86
"Kaiserol"		
Room Temperatu	re 20.58	6.17

*Water taken as 0.3.

The author reported his solubility values as an Absorption coefficient based on the concentration of radon in the gas and liquid phases. We have labelled it as an Ostwald coefficient above. The solubility was measured at a radon partial pressure of less than 0.1 kPa. The liquid was also saturated with air as a carrier gas at a pressure of about 100 kPa.

AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity.	Not stated.
APPARATUS/PROCEDURE: Electroscope used for the measurement of radioactivity.	ESTIMATED ERROR: Traubenberg's values appear to be low when compared with values reported by other workers.
	REFERENCES :

COMPONENTS:		ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² Rn; 14859-67-7		Ramstedt, E.
2. Paraffin oil.		
		<u>Le Radium</u> 1911, <u>8</u> , 253-256.
VARIABLES:		PREPARED BY:
т/К: 273.15 - 291.15		W. Gerrard
EXPERIMENTAL VALUES:	T/K C	Ostwald oefficient L
	273.15 291.15	12.6 9.2
The author reported a coefficient of solubility, S, which we have labeled an Ostwald coefficient. The coefficient was measured at a radon-222 partial pressure of less than 0.1 kPa at equilibrium. The radon was present in a carrier gas (air or nitrogen) at an initial pressure of about 101 kPa.		nt was measured at a radon-222 at equilibrium. The radon was
AUXILIARY INFORMATION		INFORMATION
METHOD: Measurement of radioacitivty liquid and in the gaseous pha		<pre>SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Paraffin oil. Dried and redistilled.</pre>
APPARATUS / PROCEDURE •		ESTIMATED ERROR:
APPARATUS/PROCEDURE: Two tubes connected by a wide tap. To determine concentration of radon, each tube is placed in a condenser.		REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Lurie, A. Thesis	
	University of Grenoble, 1910	
2. Turpentine	Microfilm available.	
	See also Tables annuelles de con-	
	stantes et donnees numeriques de chemie, de physique et de technologie	
	1913 (for 1911), 2, 401.	
VARIABLES:	PREPARED BY:	
T/K: 252.15 - 338.15	W. Gerrard	
1/1: 252.15 - 558.15	May 1977	
EXPERIMENTAL VALUES:		
T/K Mol Frac		
X ₁ `x J		
252.15 -	45.5	
273.15 14.1		
291.15 -	16.6	
293.15 -	15.9	
	7.5	
338.15 -	4.08	
The outhor reported a cold in t		
The author reported a coefficient of a the same meaning as the ratio of conce		
in the liquid/concentration of radon		
absorption has been labelled as the Os		
The coefficient of absorption was meas less than 0.1 kPa at equilibrium. The		
(air or nitrogen) at an initial press		
The mole fraction solubility at 101.32	25 kPa was calculated by the compiler.	
It was assumed that the Ostwald coeffi	cient was independent of pressure	
and that the gram-mole volume of rador 101.325 kPa. The turpentine was taken	1 18 22,290 Cm ³ at 273.15 K and	
101.325 kPa. The turpentine was taken as equivalent to α -pinene, $C_{10}H_{16}$, for the mole fraction calculation		
for the mole fraction calculation.	as equivalent to α -pinene, $C_{10}^{H}_{16}$,	
for the mole fraction calculation.	as equivalent to a-pinene, C _{10ⁿ16} ,	
for the mole fraction calculation.	as equivalent to a-pinene, Clo ⁿ l6,	
for the mole fraction calculation.	as equivalent to a-pinene, C _{10ⁿ16} ,	
for the mole fraction calculation.	as equivalent to a-pinene, C _{10ⁿ16} ,	
for the mole fraction calculation.	as equivalent to a-pinene, C _{10ⁿ16} ,	
for the mole fraction calculation.	In as equivalent to a-pinene, C ₁₀ ⁿ 16,	
for the mole fraction calculation.	INFORMATION	
for the mole fraction calculation.		
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the	INFORMATION	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified.	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid	
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for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified.	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified.	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	
for the mole fraction calculation. AUXILIARY METHOD /APPARATUS/PROCEDURE: The concentration of radon in the gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity.	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. 2. Turpentine. Purity of liquid not specified. DATA CLASS: ESTIMATED ERROR:	

COMPONENTS :	EVALUATOR:	
 Radon-222; ²²²₈₆Rn; 14859-67-7 Olive Oil 	William Gerrard Department of Chemistry The Polytechnic of North London Holloway, London N7 8DB U.K.	
	May 1977	
CRITICAL EVALUATION:		
Lurie (1) reports Ostwald coefficients for radon-222 in olive oil at temperatures of 273.15, 288.15, 313.15 and 333.15 K. Both Strasburger (2) and Schrodt (3) report a "room temperature" Ostwald coefficient which agrees with the Lurie 288.15 K value. Nussbaum and Hursh (4) report Ostwald coefficients at 298.15 and 310.15 K which are about one-third the Lurie values, and may be taken as reliable.		
The mole fraction solubility of radon-222 in olive oil was calculated assuming that olive oil is 1,2,3-propanetriyl ester of (Z)-9-octadecenoic acid,or triolein,of molecular weight 885.46. The Nussbaum and Hursh solubility values are preferred.		
The tentative values of the thermodynamic properties of solution for the transfer of one mole of radon from the gas at 101.325 kPa (1 atm) to the hypothetical unit mole fraction solution are		
$\Delta G^{O}/J \text{ mol}^{-1} = -RT \ln X_{1} = -11$.914 + 51.962 T	
$\Delta H^{\circ}/J \text{ mol}^{-1} = -11.914, \Delta S^{\circ}/J$	$\kappa^{-1} \text{ mol}^{-1} = -51.962$	
A table of tentative mole fraction solubility and Gibbs energy values as a function of temperature appears on the radon + olive oil data sheet of Nussbaum and Hursh, and in Table 1 below.		
Lawrence, Loomis, Tobias and Turpin (5) cite Bunsen coefficients for radon-222 in olive oil which they attribute to Lurie and state to be given in the International Critical Tables (6). The values are 0.01 times the values reported by Lurie. They are not found in the International Critical Tables, but they are in Seidell and Linke (7) which cite no other of Lurie's data. The radon in olive oil data cited in these references (5,7) are in error and should not be used.		
REFERENCES.		
1. Lurie, A. Thesis 1910, University	of Grenoble.	
2. Strasburger, J. Deut. Med. Wochse	<u>hr</u> . 1923, <u>49</u> , 1459.	
3. Schrodt, O. <u>Roentgenpraxis</u> (<u>Leipz</u>	<u>ig</u>) 1938, <u>10</u> , 743.	
4. Nussbaum, E.; Hursh, J. B. J. Phy	<u>s</u> . <u>Chem</u> . 1958, <u>62</u> , 81.	
 Lawrence, J. H.; Loomis, W. F.; Tobias, C. A.; Turpin, F. H. J. <u>Physiol</u>. 1946, <u>105</u>, 197. 		
 Washburn, E. W. Editor, International Critical Tables, McGraw Hill Co., New York 1928. 		
7. Seidell, A.; Linke, W. F. Solubilities of Inorganic and Organic Compounds, American Chemical Society, 1958, 1965.		
TABLE 1. The solubility of radon-222 in olive oil. Tentative values of the mole fraction solubility at a radon partial pressure of 101.325 kPa and the Gibbs energy change as a function of temperature.		
T/K Mol Fraction	ΔG ^O /J mol ⁻¹	

т/к		$\Delta G^{O}/J mol^{-1}$
298.15	23.6	3,578.7 3,838.5
308.15	20.2	4,098.3

c	25
COMPONENTS: 1. Radon-222; ²²² Rn; 14859-67-7 2. Olive oil	ORIGINAL MEASUREMENTS: Lurie, A. Thesis University of Grenoble, 1910 Microfilm available. See also Tables annuelles de con- stantes et donnees numeriques de chemie, de physique et de technologie 1913 (for 1911), 2, 401.
VARIABLES:	PREPARED BY:
т/к: 273.15 - 333.15	W. Gerrard
EXPERIMENTAL VALUES:	
$\frac{T/K}{x_1 \times x_2}$	
273.15 66.3	
288.15 -	28.6
313.15 - 333.15 -	18.6 11.1
absorption has been labelled as the Of The coefficient of absorption was mea- less than 0.1 kPa at equilibrium. The (air or nitrogen) at an initial press The mole fraction solubility at 101.3 It was assumed that the Ostwald coeff and that the gram-mole volume of rado 101.325 kPa. The olive oil was taken mole fraction calculation.	sured at a radon partial pressure of e radon was present in a carrier gas ure of about 101 kPa. 25 kPa was calculated by the compiler. icient was independent of pressure n is 22,290 cm ³ at 273.15 K and
AUXILIARY	INFORMATION '
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon in the	1, Radon-222.
gas and liquid phases determined by measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity. Diagrams given by Lurie.	 Addon-222. Olive oil. Purity of liquid not specified.
	DATA CLASS:
	ESTIMATED ERROR:
	REFERENCES :

COMPONENTS : ORIGINAL MEASUREMENTS: Radon-222; ²²²₈₆Rn; 14859-67-7 Nussbaum, E.; Hursh, J.B. 1. 2. Olive oil J. Phys. Chem. 1958, 62, 81-84. VARIABLES: PREPARED BY: W. Gerrard T/K: 298.15 - 310.15 **EXPERIMENTAL VALUES:** T/K Mol Fraction Ostwald $x_1 \times 10^2$ Coefficient Τ. 7.70 298.15 23.6 310.15 19.6 6.24 The Ostwald coefficient was measured at a very low partial pressure of radon-222. The carrier gas was nitrogen at a partial pressure of about 100 kPa. The liquid was therefore saturated with nitrogen at the experimental pressure. The mole fraction solubility of radon-222 at a pressure of 101.325 kPa was calculated by the compiler. It was assumed that the Ostwald coefficient was independent of pressure and that the gram-mole volume of radon is 22,290 cm³ at 273.15 K and 101.325 kPa. Olive oil was taken as 1,2,3-propanetriyl ester of (Z)-9-octadecenoic acid (triolein); $C_{57}H_{104}O_6$; 122-32-7 of molecular weight 885.46. Smoothed Data: $\Delta H^{0}/J \mod^{-1} = -11,914, \Delta S^{0}/J K^{-1} \mod^{-1} = -51.962$ Mol Fraction $\Delta G^{O}/J \text{ mol}^{-1}$ T/K $x_1 \times 10^2$ 298.15 3,578.7 23.6 303.15 21.8 3,838.5 4,098.3 308.15 20.2 $\Delta G^{O}/J \mod^{-1} = -11,914 + 51.962 T$ The smoothed data table was added by the Editor. AUXILIARY INFORMATION METHOD: SOURCE AND PURITY OF MATERIALS: 1. Radon-222. The concentration or radon was determined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The procedure was stated to be similar in principle to that of Boyle (1). ESTIMATED ERROR: APPARATUS / PROCEDURE : A cylindrical glass vessel with a stopcock at each end. The gammarays emitted were estimated by a **REFERENCES**: sodium iodide scintillation counter. Boyle, R.W. 1. Phil. Mag. 1911, 22, 840.

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Radon-222; 222 Rn; 14859-67-7 Schrodt, O. 2. Fats and Oils for Ointment Base. Roentgenpraxis (Leipzig) 193 VARIABLES: PREPARED BY: T/K: "Room temperature" (?) W. Gerrard EXPERIMENTAL VALUES: T/K Ostwald Coefficient L	8, <u>10</u> , 743.
<pre>1. Radon-222; 86^{Rn}; 14859-67-7 2. Fats and Oils for Ointment Base. VARIABLES: T/K: "Room temperature" (?) EXPERIMENTAL VALUES: T/K Ostwald Coefficient</pre>	8, <u>10</u> , 743.
Base. VARIABLES: T/K: "Room temperature" (?) EXPERIMENTAL VALUES: T/K Ostwald Coefficient	8, <u>10</u> , 743.
T/K: "Room temperature" (?) EXPERIMENTAL VALUES: T/K Ostwald Coefficient	
T/K Ostwald Coefficient	<u> </u>
Vaseline - 6.68 Lard - 7.73 Beeftallow	
- 4.1 Lanolin	
- 7.3 Eucerin anhydricum	
- 6.8 Eucerin cum aqua	
- 7.27 Unguentolan - 9.26	
Cocoabutter - 5.5	
Olive oil - 28.1	
Paraffin oil - 11.7	
The absorption coefficient (Ostwald coefficient) was based on the r concentrations of radon in the liquid and gaseous phases at very sm partial pressures of radon-222.	atio of all
AUXILIARY INFORMATION	· · · · · · ·
METHOD: Concentrations of radon were measured by the determination of radioactivity at very small partial pressures of radon.	4 ,
	,
APPARATUS/PROCEDURE: ESTIMATED ERROR:	
Glass bulbs and electroscope. Diagrams given by Schrodt.	
REFERENCES:	<u></u>

COMPONENTS:	ORIGINAL MEASUREMENTS: Lurie, A.
1. Radon-222; ²²² ₈₆ Rn; 14859-67-	-7 Thesis
2. Colza oil	University of Grenoble, 1910 Microfilm available.
	See also Tables annuelles de con-
	stantes et donnees numeriques de
	chemie, de physique et de technologie 1913 (for 1911), 2, 401.
VARIABLES:	PREPARED BY:
Т/К: 270.15 - 473.15	W. Gerrard
EXPERIMENTAL VALUES:	
	T/K Ostwald · Coefficient
27	70.15 51.2
	33.15 35.3
	93.15 26.1 23.15 16.75
37	3.15 6.25
47	/3.15 3.3
The author reported a coofficie	ent of absorption, α , which appears to have
the same meaning as the ratio of	of concentrations: concentration of radon
in the liquid/concentration of	radon in the gas. The coefficient of
absorption has been labelled as	s the Ostwald coefficient.
The coefficient of absorption w	vas measured at a radon partial pressure of
less than 0.1 kPa at equilibriu (air or nitrogen) at an initial	m. The radon was present in a carrier gas
	pressure of about for kra.
A	UXILIARY INFORMATION
METHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon in t	he 1. Radon-222.
gas and liquid phases determine	
by measurements of radioactivit An aluminum foil electroscope w	
used to measure the radioactivi	
Diagrams given by Lurie.	
	ESTIMATED ERROR:
	REFERENCES:

COMPONENTS:		INAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-6	7-7 Lui	rie, A. esis
2. Poppy oil		versity of Grenoble, 1910
2. 10000 011	Mic	rofilm available.
		e also Tables annuelles de con- antes et donnees numeriques de
		mie, de physique et de technologie
		.3 (for 1911), <u>2</u> , 401.
VARIABLES:	PREI	ARED BY:
		W. Gerrard
T/K: 268.15 - 363.1	5	
EXPERIMENTAL VALUES:		······································
		wald
	00011	L
	268.15 50	.7
	289.15 30	.2
		. 05
		. 4
The author reported a coeffic the same meaning as the ratio in the liquid/concentration o absorption has been labelled	of concentra f radon in th	ption, α, which appears to have tions: concentration of radon e gas. The coefficient of d coefficient.
The coefficient of absorption	was measured	at a radon partial pressure of
less than 0.1 kPa at equilibr (air or nitrogen) at an initi	ium. The rad	on was present in a carrier gas
(all of microgen, at an initi	ar pressure o	I about ioi kra.
	AUXILIARY INFO	RMATION
METHOD /APPARATUS/PROCEDURE:	SOU	RCE AND PURITY OF MATERIALS:
The concentration of radon in		Radon-222.
gas and liquid phases determin		
by measurements of radioactiv An aluminum foil electroscope		Poppy oil. Purity of liquid not specified.
used to measure the radioactiv		not specified.
Diagrams given by Lurie.	-	
		١
	POT	
	LST	IMATED ERROR:
	REF	ERENCES:
1	1	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Lurie, A. Thesis
2. Vaseline oil	University of Grenoble, 1910
	Microfilm available. See also Tables annuelles de con-
	stantes et donnees numeriques de
	chemie, de physique et de technologie 1913 (for 1911), 2, 401.
VARIABLES:	PREPARED BY:
T/K: 263.15 - 323.15	W. Gerrard
1/1. 205.15 525.15	
EXPERIMENTAL VALUES:	
T/K	Ostwald Coefficient
263.15	23.67
273.15 288.15	15.16 11.1
298.15	8.36
323.15	6.6
The author reported a coefficient of a	bsorption, a, which appears to have
the same meaning as the ratio of conce in the liquid/concentration of radon i absorption has been labelled as the Os	ntrations: concentration of radon in the gas. The coefficient of
The coefficient of absorption was meas less than 0.1 kPa at equilibrium. The (air or nitrogen) at an initial pressu	e radon was present in a carrier gas
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon in the	1. Radon-222.
gas and liquid phases determined by	
measurements of radioactivity. An aluminum foil electroscope was used to measure the radioactivity. Diagrams given by Lurie.	2. Vaseline oil. Purity of liquid not specified.
	ESTIMATED ERROR:
	REFERENCES:

CONDANENTS .	OPTOTINAL MEASUREMENTS
COMPONENTS: 1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	ORIGINAL MEASUREMENTS: Nussbaum, E.; Hursh, J.B.
	Nussbaum, E.; Hursh, J.B.
2. Animal Fats	
	<u>J. Phys. Chem</u> . 1958, <u>62</u> , 81-84.
VARIABLES: T/K: 310.15	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES: T/K	Ostwald
	Coefficient L
 Butt	er fat
	5.91
	Eatty acids racted)
310.15	
	n fat racted)
310.15	6.33
<u> </u>	
mental pressure.	aturated with nitrogen at the experi-
	aturated with hitrogen at the experi-
mental pressure.	
mental pressure.	INFORMATION
mental pressure. AUXILIARY METHOD:	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactivity	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce-	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: The concentration of radon was deter- mined by measurement of radioactiviti in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in	INFORMATION SOURCE AND PURITY OF MATERIALS:
METHOD: METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD: METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma-	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. ESTIMATED ERROR: REFERENCES:
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222.
METHOD: METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. ESTIMATED ERROR: REFERENCES: 1. Boyle, R.W.
METHOD: The concentration of radon was deter- mined by measurement of radioactivity in samples withdrawn from the liquid and from the gas phases. The proce- dure was stated to be similar in principle to that of Boyle (1). APPARATUS/PROCEDURE: A cylindrical glass vessel with a stopcock at each end. The gamma- rays emitted were estimated by a	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Radon-222. ESTIMATED ERROR: REFERENCES: 1. Boyle, R.W.

COMPONENTS: 1. Radon-222; 222 86Rn; 14859-67-7	ORIGINAL MEASUREMENTS:
86 ⁽¹⁾ 14055-07-7	Nussbaum, E.; Hursh, J.B.
2. Rat Tissues	<u>Science</u> 1957, <u>125</u> , 552.
VARIABLES: T/K: 310.15	PREPARED BY: W. Gerrard
1/K. 510.15	w. Gerraru
EXPERIMENTAL VALUES: T/K	Ostwald
	Coefficient
	<u>+</u> Std. Dev.
Omenta	l Fat
310.15 4	.83 <u>+</u> 0.07
Venous	Blood
310.15 0	.405 <u>+</u> 0.016
Brain	
310.15 0	.309 <u>+</u> 0.008
Kidney	The Ostwald coefficient
310.15 0	$.285 \pm 0.012$ was measured at a very
Liver	- low partial pressure of radon. The carrier gas
310.15 0	.306 + 0.004 was nitrogen at a par-
Heart	tial pressure of about 100 kPa. The liquid
310.15 0	.221 ± 0.013 was therefore saturated
Testis	with nitrogen at the experimental pressure.
310.15 0	.184 + 0.007
Muscle	
310.15 0	.154 <u>+</u> 0.005
	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
The concentration of radon was deter- mined by measurement of radioactivity	1. Radon-222.
in samples withdrawn from the liquid	2. Rat Tissues. Adult Rochester
and from the gas phases. The pro- cedure was stated to be similar in	Wistar rats breathed air contain-
principle to that of Boyle (1).	ing 0.5 - 5 μ c dm ⁻³ radon-222 from 30 minues to 48 hours. Rats
	were sacrificed by the introduc-
	tion of CO to the breathing cham- ber. Specified rat tissues were
	dissected, placed in tarred test
	tubes and sealed.
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
A cylindrical glass vessel with a	
stopcock at each end. The gamma-	
rays emitted were estimated by a sodium iodide scintillation counter.	DEPENDENCES .
	REFERENCES: 1. Boyle, R.W.
	 Boyle, R.W. <u>Phil</u>. <u>Mag</u>. 1911, <u>22</u>, 840.

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; 222 86Rn; 14859-67-7	Knaffle-Lenz, E.
2. Blood	<u>Z. Balneolgie</u> 1912, <u>5</u> , nr. 14.
VARIABLES:	PREPARED BY:
т/к: 310.15	W. Gerrard
-,	W. Gerlaru
EXPERIMENTAL VALUES:	
Knaffle-Lenz reported	that at 310.15 K the
absorption coefficien times that for water	nt for blood is 0.42
AUXILIARY	INFORMATION
ME THOD :	SOURCE AND PURITY OF MATERIALS:
	ι,
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
	REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Radon-222; ²²² ₈₆ Rn; 14859-67-7	Tasca, M.
2. Egg Lecithin	Radiol. Med. (Milan) 1940, 27, 401.
VARIABLES:	PREPARED BY:
	W. Gerrard
EXPERIMENTAL VALUES:	
Tasca reported the the "quantity" lecithin is 40 time that retained water, at a temperature which was could have been room temperature.	by an equal volume of not clearly stated, but
Nussbaum and Hursh (1) cite Tasca and express this solubility as the Ostwald coefficient, 6.4 at 310.15 K, presumably obtained from 40 x 0.16, where 0.16 is the radon Ostwald coefficient in water at 310.15 K.	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
	REFERENCES: 1. Nussbaum, E.; Hursh, J. B.
	J. Phys. Chem. 1958, 62, 81.

COMPONENTS:	EVALUATOR:
 Radon-219 (Actinium Emanation); 219_{Rn}; 14835-02-0 86 Liquids 	William Gerrard Department of Chemistry The Polytechnic of North London Holloway, London N7 8DB United Kingdom

CRITICAL EVALUATION:

The half life of radon-219 (actinon) is only 3.92 seconds. The mean values of the partition coefficient show a variation from 5 to 10 % (one is 20 %) from the observed maximum. The partition coefficient for the non-aqueous liquid, or the aqueous solution, was given as that compared with water, taken to be 2. The evaluator contends that it is much more reliable to take the observed radon-222 values as those for radon-219 (actinon).

Hevesy's (1,2) results for the solubility of radon-219 in various liquids are on the following data sheets.

1. Hevesy, G. Phys. Z. 1911, 12, 1214.

2. Hevesy, G. J. Phys. Chem. 1912, 16, 429.

COMPONENTS :	ORIGINAL MEASUREMENTS:	
1. Radon-219 (Actinium Emanation); 219 86Rn; 14835-02-0	Hevesy, G.	
2. Water; H ₂ O; 7732-18-5	Phys. Z. 1911, 12, 1214	
3. Electrolytes	J. Phys. Chem. 1912, 16, 429-453.	
VARIABLES: T/K: "Ordinary Temperatures"	PREPARED BY: W. Gerrard	
EXPERIMENTAL VALUES:		
T/K	Absorption Ostwald Relative to Coefficient Water L	
Water; H ₂ O; 7732-18-5	5	
"Ordinary Temperatures"	(1) 2	
Potassium chloride; I	KC1; 7447-40-7	
"Ordinary Temperatures"	0.9 1.8	
Sulfuric Acid (conc.)); H ₂ SO ₄ ; 7664-93-9	
"Ordinary Temperatures"	0.95 1.9	
and air relative to the partition coefficient of radon-219 between air and water, which was taken as 2. We have called the partition coefficient an Ostwald coefficient. The Ostwald coefficient was measured at a radon partial pressure of less than 0.1 kPa at equilibrium. The radon was present in air as a carrier gas.		
AUXILIARY	INFORMATION	
METHOD:	SOURCE AND PURITY OF MATERIALS:	
Dried air was passed over a radon-219 preparation, and then through a column of liquid in which part was absorbed, and the remainder passed to the ionization chamber of an electroscope.	No details.	
	ECTIMATED EDDOD.	
APPARATUS/PROCEDURE:	ESTIMATED ERROR:	
Assembly for the "dynamical flow method" as distinct from the shaking method. Radioactivity was	$\delta L/L = 0.05 - 0.10$	
measured. The partial pressure of radon-219 was extremely small.	REFERENCES :	

	1	ORIGINAL MEASURE	MENTS:	
<pre>1. Radon-219 (Actinium Ema 219 86Rn; 14835-02-0</pre>	anation);	Hevesy, G.		
2. Hydrocarbons		<u>Phys</u> . <u>Z</u> . 191	1, <u>12</u> , 1214	
		J. Phys. Che	<u>m</u> . 1912, <u>16</u> ,	429-453.
VARIABLES:		PREPARED BY:		
T/K: "Ordinary Tempera	atures"		W. Gerrard	
EXPERIMENTAL VALUES:				
T/1	ζ.	Absorption Relative to Water	Ostwald Coefficient L	
Benzene; (C ₆ H ₆ ; 71-43-	•2		
"Ordinary Ter		1.7	3.4	
Toluene; (с ₇ н ₈ ; 108-88	-3		
"Ordinary Ter	mperatures"	1.8	3.6	
Petroleum				
"Ordinary Ter	nperatures"	1.9	3.8	
and air relative to the par water, which was taken as a Ostwald coefficient. The Ostwald coefficient was	2. We have	called the pa		icient an
than 0.1 kPa at equilibrium gas.				
than 0.1 kPa at equilibrium	n. The rado			
than 0.1 kPa at equilibrium gas. METHOD:	n. The rado	on was present	in air as a	carrier
than 0.1 kPa at equilibrium gas.	AUXILIARY A radon-219 1gh a part was r passed	on was present INFORMATION	in air as a TY OF MATERIALS	carrier
METHOD: Dried air was passed over a preparation, and then throu column of liquid in which p absorbed, and the remainded to the ionization chamber of electroscope.	AUXILIARY A radon-219 1gh a part was r passed	on was present INFORMATION SOURCE AND PURI	in air as a TY OF MATERIALS ls.	carrier
<pre>METHOD: Dried air was passed over a preparation, and then throw column of liquid in which a absorbed, and the remainded to the ionization chamber of</pre>	AUXILIARY A radon-219 1gh a part was r passed of an l flow he	INFORMATION SOURCE AND PURI NO detai	in air as a TY OF MATERIALS ls.	carrier

COMPONENTS :	ORIGINAL MEASUREMENTS:
<pre>1. Radon-219 (Actinium Emanation); 219 86Rn; 14835-02-0</pre>	Hevesy, G.
 Oxygen or sulfur containing organic compounds 	<u>Phys. Z. 1911, 12, 1214</u> J. <u>Phys. Chem. 1912, 16</u> , 429-453.
VARIABLES:	PREPARED BY:
T/K: "Ordinary Temperatures"	W. Gerrard
EXPERIMENTAL VALUES:	
T/K	Absorption Ostwald Relative to Coefficient Water L
Ethanol; C ₂ H ₆ O; 64-1	7-5
"Ordinary Temperatures"	
Pentanol-1 (Amyl Alc	cohol); C ₅ H ₁₂ O; 71-41-0
"Ordinary Temperatures"	
Benzaldehyde; C ₇ H ₆ O;	100-52-7
"Ordinary Temperatures"	
Carbon Disulfide; CS	5 ₇ ; 75-15-0
"Ordinary Temperatures:	-
than 0.1 kPa at equilibrium. The rad gas.	
AUXILIARY	INFORMATION
METHOD:	
	SOURCE AND PURITY OF MATERIALS:
Dried air was passed over a radon-219 preparation, and then through a column of liquid in which part was absorbed, and the remainder passed to the ionization chamber of an electroscope.	SOURCE AND PURITY OF MATERIALS:
preparation, and then through a column of liquid in which part was absorbed, and the remainder passed to the ionization chamber of an electroscope.	SOURCE AND PURITY OF MATERIALS:
APPARATUS/PROCEDURE: Assembly for the "dynamical flow method" as distinct from the	SOURCE AND PURITY OF MATERIALS: No details.
<pre>preparation, and then through a column of liquid in which part was absorbed, and the remainder passed to the ionization chamber of an electroscope.</pre>	SOURCE AND PURITY OF MATERIALS: No details. ESTIMATED ERROR:

COMPONENTS :	EVALUATOR:
 Radon-220 (Thorium Emanation); ²²⁰_{Rn}; 22481-88-7 86 Liquids 	William Gerrard Department of Chemistry The Polytechnic of North London Holloway, London N7 8DB United Kingdom
CRITICAL EVALUATION:	220
The half life of radon-220 (thoron),	820 Rn, is 54.5 seconds. Therefore the
reported absorption coefficients must be accepted with caution. Boyle (1) used a streaming method (diagram given in the original paper) and placed the following liquids in the order of increasing solutility: but did not give actual values: CuSO ₄ (aqueous) < CaCl ₂ (aqueous) < water <	
H_2SO_4 < alcohol < petroleum; "the same	es for radon (radon-222)."
Klaus (2) reported the solubility of radon-220 in water and petroleum (see the following two data sheets).	
The evaluator contends that it is much values for radon-222 as the values for	
References: 1. Boyle, R.W., Le Radio	<u>ım</u> , 1910, <u>7</u> , 200. See also
Boyle, R.W., <u>Bull</u> . <u>M</u> a	acdonald Physics Bldg., 1910, <u>1</u> , 52.
2. Klaus, A. <u>Phys</u> . Z. 1	.905, <u>6</u> , 820.

COMPONENTS :	ORIGINAL MEASUREMENTS:
<pre>1. Radon-220 (Thorium Emanation);</pre>	Klaus, A.
2. Water; H ₂ O; 7732-18-5	<u>Phys</u> . <u>Zeit</u> ., 1905, <u>6</u> , 820.
VARIABLES:	PREPARED BY:
m (Weinschlassen 2000	
T/K: about 292	W. Gerrard
EXPERIMENTAL VALUES: T/K	Ostwald
	Defficient L
about 292	1.052
The author reported an Absorption coer in liquid phase)/(concentration radon- called an Ostwald coefficient.	fficient as (concentration radon-220 -220 in gas phase) which we have
The Ostupld coefficient up recound	
The Ostwald coefficient was measured a than 0.1 kPa at equilibrium. The rade or nitrogen) at an initial pressure of	on was present in a carrier gas (air
-	
AUXILIARY	INFORMATION
METHOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity by an	
electroscope.	Not specified.
	ESTIMATED ERROR:
APPARATUS / PROCEDURE :	
Gas cylinder, 500 cm ³ . Absorption	
vessel, 1.25 dm ³ , which is shaken.	
Author gave a diagram.	REFERENCES :

COMPONENTS :	ORIGINAL MEASUREMENTS:
<pre>1. Radon-220 (Thorium Emanation);</pre>	Klaus, A.
2. Petroleum	<u>Phys</u> . <u>Zeit</u> ., 1905, <u>6</u> , 820.
VARIABLES: T/K: about 292	PREPARED BY: W. Gerrard
EXPERIMENTAL VALUES: T/K	Ostwald Coefficient L
about 292	4.97
in liquid phase)/(concentration rad called an Ostwald coefficient. The Ostwald coefficient was measure	ed at a radon partial pressure of less radon was present in a carrier gas (air
AUXILI	ARY INFORMATION
ME THOD:	SOURCE AND PURITY OF MATERIALS:
Measurement of radioactivity by an electroscope.	Not specified.
	``````````````````````````````````````
APPARATUS/PROCEDURE:	ESTIMATED ERROR:
Gas cylinder, 500 cm ³ . Absorption	
vessel, 1.25 dm ³ , which is shaken. Author gave a diagram.	
Auchor gave a dragram.	REFERENCES :
1	

## SYSTEM INDEX

Underlined page numbers refer to the evaluation text and those not underlined to the compiled tables for that system. The compounds are listed in the order as in the Chemical Abstract indexes, for example toluene is listed as benzene, methyl- and dimethylsulfoxide is listed as methane, sulfinylbis-. Α Acetate, butyl, see acetic acid, butyl ester ethyl, see acetic acid, ethyl ester Acetic acid (glacial) + krypton 84 291, 292-293 + radon-222 + xenon 171 butyl ester + krypton 85 ethyl ester + radon-222 312 313 pentyl ester + radon-222 Acetone, see 2-propanone Acids, see under individual acids Acrylic acid, see 2-propenoic acid Adrenals, see guinea pig adrenals Albumin, human, see human albumin Alpha-D-glucopyranoside, beta-D-fructofuranosyl-, see sucrose Ammonia + krypton (high pressure) 105 12-13, Ammonium chloride (aqueous) + krypton 14  $2\overline{38-241}, 2\overline{42}$  $2\overline{38-241}, 2\overline{43}$ chloride (aqueous) + radon-222 nitrate (aqueous) + radon-222 tetraethyl bromide, see ethanaminium, N,N,Ntriethyl bromide tetramethyl iodide, see methanaminium, N,N,N-trimethyl iodide 70 Amsco + krypton 169 + xenon Amyl acetete, see acetic acid, pentyl ester alcohol, see 1-pentanol Aniline, see benzenamine R 12-13, 19 Barium chloride (aqueous) + krypton nitrate, see nitric acid, barium salt Beef tallow + radon-222 331 Benzaldehyde + radon-219 339, 342 320 Benzenamine + radon-222 + xenon 188, 189 Benzene + krypton 62 339, 341 + radon-219 + radon-222 264 + xenon 166 bromo- + krypton 93 179 bromo- + xenon chloro- + krypton 91 178 chloro- + xenon 1,4-dibromo-94 + krypton 1,4-dibromo-, (ternary) + krypton 94 1,2-Benzenedicarboxylic acid, dibutyl ester + krypton 85 92 Benzene 1,4-dichloro-+ krypton 92 1,4-dichloro-, (ternary) + krypton 1,4-diiodo-+ krypton 96 96 + krypton 1,4-diiodo-, (ternary) diphenyl- , see terphenyl 270, 271 + radon-222 dimethy1, 64 1,2-dimethyl-+ krypton 65 1,3-dimethyl-+ krypton 66, 67 + krypton 1,4-dimethyl-92, 94, 1,4-dimethyl-, (ternary) + krypton 96 168 1,4-dimethyl-+ xenon + krypton 89 fluoro-177 fluoro-+ xenon 90 hexafluoro-+ krypton 95 iodo-+ krypton iodo-+ xenon 180

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