INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

ANALYTICAL CHEMISTRY DIVISION COMMISSION ON SOLUBILITY DATA

## SOLUBILITY DATA SERIES

Volume 21

AMMONIA, AMINES, PHOSPHINE, ARSINE, STIBINE, SILANE, GERMANE AND STANNANE IN ORGANIC SOLVENTS

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# **SOLUBILITY DATA SERIES**

*Editor-in-Chief* A. S. KERTES

Volume 21

## AMMONIA, AMINES, PHOSPHINE, ARSINE, STIBINE, SILANE, GERMANE AND STANNANE IN ORGANIC SOLVENTS

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INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY IUPAC Secretariat: Bank Court Chambers, 2–3 Pound Way, Cowley Centre, Oxford OX4 3YF, UK 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, and thus obviously are superficial in treatment. Since they command a wide market, we believe that their service to the 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 relationship 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 careful 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 disgualified 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 the treatment of 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;
- (iii) 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.

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Foreword

The typical data sheet carries the following information:

- (i) components definition of the system their names, formulas and Chemical Abstracts registry numbers;
- (i1) 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, abscract 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;
- (viii)
- (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, formulated at the initiation of the project and perfected as experience has accumulated, 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 consolidation 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 the early 1970s to refrain from unnecessary publication has not achieved much. A good fraction of the literature is still cluttered with poor-quality articles. The Weinberg report (in 'Reader in Science Information', ed. 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 project. 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

#### PREFACE

This volume of *The Solubility Data Series* covers the solubility of ammonia, *N*-methylmethanamine and *N*,*N*-dimethylmethanamine in pure liquids not including water. Data on the solubility of some higher amines at pressures below the vapor pressure of the liquid amine are also included as are data on the solubility of deuterated methanamine and deuterated *N*-methylmethanamine. The volume also covers the available data on the solubility of phosphine, arsine, stibine, bismuthine, silane, germane and stannane in non-aqueous solvents. The editors believe that all solubility values published up to June 1983 have been included but would be grateful to learn of significant omissions.

In few cases can one be certain that the available data has an accuracy better than about ±3%. In many cases data may have an accuracy less than this. It is hoped that this and other similar volumes in *The Solubility Data Series* will draw attention to the systems for which there is lack of good data and will stimulate further experimental work in the field.

The editors wish to make a plea that authors publishing gas solubility data should always report the primary experimental observations of temperature, pressure, volume, etc. and should indicate the precise method used to calculate solubility values. Much of the value, for instance, of an Ostwald coefficient is lost if the pressure at which measurements were made is not reported. Henry's law constants have been defined and calculated in a variety of ways and the precise significance of a particular value is often lost if pressure measurements are not given.

A variety of techniques have been used to measure solubilities of the systems under consideration. The merits of experimental methods have been taken into account in the evaluation of data. Estimates have also been made as to whether particular values fit general patterns of solubility which appear to emerge when similar systems are compared. However, much more accurate experimental work is needed before such patterns are precisely defined.

The editors are grateful for advice and help given by fellow members of the I.U.P.A.C. Commission on Solubility Data. Colin Young wishes to acknowledge the help given by Professor H. L. Clever, Director of the Solubility Data and Information Project at Emory University. Peter Fogg is grateful to Dr W. Gerrard for stimulating and helpful discussions on the interpretation of published solubility data. He also wishes to acknowledge support for travel in connection with the preparation of this volume from The Royal Society of London, from I.U.P.A.C. and from The Polytechnic of North London.

Both editors wish to express their appreciation to Lesley Flanagan for typing the final manuscript.

Peter Fogg

London

Colin Young

Melbourne

November 1983

## THE SOLUBILITY OF GASES IN LIQUIDS

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

#### INTRODUCTION

The Solubility Data Project aims to make a comprehensive search of the literature for data on the solubility of gases, liquids and solids 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".

#### The Solubility of Gases in Liquids

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. \*

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#### 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)

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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.

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

 $x(g) = \frac{[wt^{\$}/M(g)]}{[wt^{\$}/M(g)] + [(100 - wt^{\$})/M(1)]}$ 

The Weight Solubility, Cw

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

$$x = \frac{n v^{O}(1)}{1 + n v^{O}(1)}$$

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

#### The Bunsen Coefficient, a

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 is related to the Bunsen coefficient by

$$x(g, 1 atm) = \frac{1}{\alpha + \frac{273.15}{T} \frac{v^{o}(g)}{v^{o}(1)}}$$

α

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,

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

Real gases do not follow the ideal gas law and it is important to establish the real gas law used for calculating  $\alpha$  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 at the ratio of the volume of gas absorbed to the volume of the absorbing liquid, all measured at the same temperature:

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

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

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$$x(g) = \frac{RT}{P(g) L v^{O}(1)} + 1$$

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

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#### 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.  $\beta$  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 Contant

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

 $P(g) = K_{H} x(g)$ 

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

 $P(g) = K_2C(1)$ ,

or

 $C(g) = K_C(1)$ 

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.

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TABLE 1. Interconversion of parameters used for reporting solubility.

 $L = \alpha(T/273.15)$   $C_{w} = \alpha/v_{o}\rho$   $K_{H} = \frac{17.033 \times 10^{6}\rho(\text{soln})}{\alpha M(1)} + 760$   $L = C_{w} v_{t,gas} \rho$ 

where v<sub>o</sub> is the molal volume of the gas in cm<sup>3</sup> mol<sup>-1</sup> at 0°C,  $\rho$  the density of the solvent at the temperature of the measurement,  $\rho_{soln}$  the density of the solution at the temperature of the measurement, and v<sub>t,gas</sub> the molal volume of the gas (cm<sup>3</sup> mol<sup>-1</sup>) at the temperature of the measurement.

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Revised: December 1984 (CLY)

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An asterisk (\*) denotes an exact relationship.

Ammonia Solubilities

COMPONENTS:	EVALUATOR:
(l) Ammonia; NH <sub>3</sub> ; [7664-41-7] (2) Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

CRITICAL EVALUATION:

The solubility of ammonia has been measured in a wide variety of solvents. Some systems have been investigated by more than one worker or group of workers enabling comparisons between sets of results to be made. Comparison of solubilities in chemically similar solvents indicates general trends in solubility and draws attention to values which do not conform to general patterns. In cases where solubilities at several pressures have been measured the variation with pressure may be compared with that found for other systems. Where variations of solubility with change of temperature have been measured it is possible to compare the so-called "heats of solution" and "entropies of solution" for different systems. In cases where only a single solubility value at one temperature and one pressure has been measured the extent to which comparisons with other systems may be made, is rather limited.

In some cases the solubilities of ammonia for given partial pressures have been reported. In other cases the solubilities correspond to given total pressures made up of partial pressures of solvent and partial pressures of ammonia. In order to compare different cets of measurements it has sometimes been necessary to convert solubility values for given total pressures to the corresponding mole fraction solubilities for a partial pressure of ammonia of 760 mmHg. In the absence of data from which activity coefficients can be calculated, approximate corrections have been made by the method used by Hildebrand (1). It has been assumed that the partial vapor pressure of the solvent is proportional to the mole fraction of the solvent (i.e., that the solvent obeys Raoult's law) and that the mole fraction solubility of ammonia is proportional to the partial pressure of ammonia over a short pressure range.

#### Hydrocarbons

In general, mole fraction solubilities are low compared with "Raoult's law" values and compared with mole fraction solubilities in alcohols measured under the same conditions. The solubilities are greater in aromatic hydrocarbons than in non-aromatic hydrocarbons.

#### Non-aromatic hydrocarbons

#### Hexane; $C_6H_{14}$ ; [110-54-3]

Bell (2) measured the solubility of ammonia in hexane at 293.2 K and a partial pressure of 760 mmHg and also reported unpublished measurements of the mole fraction solubilities in octane, dodecane and hexadecane which had been measured by Brønsted and Volqvartz. The mole fraction solubility in hexane at 298.2 K and a partial pressure of 1 atm has been reported by Patyi *et al.* (3). If both solubility values for hexane are correct it would indicate a large variation of mole fraction solubility with change of temperature. This is not entirely inconsistent with the solubility data for amines in this solvent but both values should be used with caution.

The Ostwald coefficient reported by Horsman-van den Dool and Warman (4) and measured at 292.4 K and an unspecified pressure can be compared with the solubility measurements discussed above if it is assumed that Ostwald coefficients are independent of pressure. The corresponding mole fraction solubility is about 7% less than the value at 298.2 K reported by Patyi *et al.* but Horsman-van den Dool and Warman used very simple apparatus.

COMPONENTS:	EVALUATOR:
<ul> <li>(1) Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>(2) Organic liquids</li> </ul>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

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Octane; C<sub>8</sub>H<sub>18</sub>; [111-65-9]: 2,2,4-Trimethylpentane; C<sub>8</sub>H<sub>18</sub>; [540-84-1]:
Dodecane; C<sub>12</sub>H<sub>26</sub>; [112-40-3]
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There are no other solubility values for octane and dodecane for direct comparison with the values reported by Bell. However Bell's value for the mole fraction solubility in octane at 293.2 K and 1 atm is within about 2% of the value for the mole fraction solubility in 2,2,4-trimethylpentane at 292.4 K and 1 atm which may be estimated from the Ostwald coefficient measured at an unspecified pressure by Horsman-van den Dool and Warman.

Hexadecane; C16H34; [544-76-3]

Tremper and Prausnitz (5) measured the solubilities of ammonia in hexadecane at eight temperatures between 300 K and 475 K. Henry's law constants were reported. The pressures at which measurements were made were not stated. Mole fraction solubilities at 1 atm calculated from these Henry's law constants are in agreement with the general pattern of data for the hydrocarbons. In particular, extrapolation of the mole fraction solubility at 1 atm to 293.2 K gives a value within about 8% of the mole fraction solubility of hexadecane at 1 atm as reported by Bell. The Henry's law constants measured by Tremper and Prausnitz are reliable for calculation of mole fraction solubilities to pressures of about 1 atm.

The mole fraction solubilities in samples of kerosine and of diesel oil published by Messow and Pape (6) are in line with values for pure hydrocarbons of similar boiling point.

Cyclohexane; C<sub>6</sub>H<sub>12</sub>; [110-82-7]

The mole fraction solubility of ammonia in cyclohexane at 292.2 K and 1 atm from measurements by Kuznetsov  $et \ al$ . (7) is out of line with values for all other hydrocarbons and should therefore be disregarded.

Ostwald coefficients for this system at unspecified pressures have been reported by Horsman-van den Dool and Warman (4) and also by Hentz and Sherman (8). In both cases very simple apparatus was used. Corresponding values of mole fraction solubilities for a partial pressure of 1 atm may be estimated on the assumption that Ostwald coefficients are independent of pressure. The Horsman-van den Dool value corresponds to a mole fraction solubility of about 0.011 at 1 atm and 292.5 K. The Hentz and Sherman value corresponds to a mole fraction of about 0.009 at 1 atm and about 297 K. Both of these values fall below the value of 0.035 at 1 atm and 298.2 K given by Patyi *et al*(3). The apparatus and technique used by Patyi *et al*. are Likely to be more reliable than those used by the other groups but further measurements on this system are needed in view of the disagreement between various solubility values.

Methylcyclohexane; C<sub>7</sub>H<sub>14</sub>; [108-87-2]

The Ostwald coefficient for solubility in methylcyclohexane at an unspecified pressure and 297.5 K has also been reported by Horsman-van den Dool and Warman. The value needs to be supported by other measurements on the system.

1,1'-Bicyclohexyl; C<sub>12</sub>H<sub>22</sub>; [92-51-3]

Mole fraction solubilities in 1,1'-bicyclohexyl at a partial pressure of 1 atm may be calculated from Henry's law constants measured by

COMPONENTS:	EVALUATOR:
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	P. G. T. Fogg, School of Chemistry,
(2) Organic liquids	Polytechnic of North London, Holloway, London, U.K.
	January 1984

Tremper and Prausnitz (5) at unspecified pressures and eight temperatures in the range 300 K to 475 K. These mole fraction solubilities are low compared with values for other hydrocarbons but may be accepted as reliable values. Horsman-van den Dool and Warman (4) have reported Ostwald coefficients for this system. These were measured at 295.6 K and 301.2 K and unspecified pressures and correspond to mole fraction solubilities which are over 20% greater than those which may be calculated from the Henry's law constants reported by Tremper and Prausnitz. The measurements by Horsman-van den Dool and Warman are likely to be less reliable than those carried out by Tremper and Prausnitz.

cis-Decahydronaphthalene;  $C_{10}H_{18}$ ; [493-01-6]; trans-Decahydronaphthalene;  $C_{10}H_{18}$ ; [493-02-7]

Ostwald coefficients for solubilities of ammonia in *cis-* and *trans*decalin were also measured by Horsman-van den Dool and Warman at 300.1 K and 301.3 K and unspecified pressures. The corresponding mole fraction solubilities may be estimated on the assumption that Ostwald coefficients are independent of pressure. These mole fraction solubilities are close to those estimated for 1,1'-bicyclohexyl from the Ostwald coefficients given by these authors for this compound and discussed above. Although no great reliance ought to be placed on these solubilities in the decalins until they are supported by other measurements on these systems, they are of the right order of magnitude.

#### Cyclohexene; C<sub>6</sub>H<sub>10</sub>; 110-83-8

The solubility of ammonia at 273.2 K and 293.2 K and various pressures in pure cyclohexene, in mixtures with benzene and in pure benzene have been measured by Noda *et al.* (9). The mole fraction solubilities in cyclohexene at 1 atm partial pressure, are lower than solubilities in alkanes or in benzene. The variation in solubility, as the proportion of cyclohexene is reduced, follows a consistent pattern. There is no reason to doubt the reliability of the measurements which can be accepted on a tentative basis.

#### Aromatic hydrocarbons

#### Benzene; C<sub>6</sub>H<sub>6</sub>; [71-43-2]

Mole fraction solubilities are higher in aromatic hydrocarbons than in non-aromatic hydrocarbons. Mole fraction solubilities in benzene were measured by Noda *et al.* (9) at 273.2 K and 293.2 K and pressures approaching the vapor pressures of liquid ammonia at the temperatures of measurement. When these solubilities are plotted against the partial pressure of ammonia it is found that points fall on smooth curves which can be extrapolated through  $x_{\rm NH_3} = 1$ ;  $p_{\rm NH_3} =$  vapor pressure of liquid ammonia.

The mole fraction solubility at 293.2 K and a partial pressure of ammonia of 1 atm has been estimated from these measurements by the evaluator and found to be 0.038. This contrasts with the value of 0.0474 for this temperature and pressure given by Bell (2). The evaluator has also estimated the corresponding value at 298.2 K by extrapolation of values calculated from measurements by Noda *et al.* This estimated value of 0.033 also contrasts with the value of 0.0257 from work by Patyi *et al.* (3). Since the measurements by both Bell and Patyi *et al.* were made at one pressure only whereas the measurements reported by Noda *et al.* were made at a series of pressures and lead to a consistent set of solubility values, it is likely that the latter are

COMPONENTS:	EVALUATOR:
(l) Ammonia; NH <sub>3</sub> ; [7664-41-7] (2) Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

the most reliable. These should therefore be accepted as tentative values.

Methylbenzene;  $C_{7H_8}$ ; [108-88-3]; 1-Methylnaphthalene;  $C_{11H_{10}}$ ; [1321-94-4]

The mole fraction solubility in methylbenzene at 1 atm partial pressure of ammonia has been given by Bell (2) as 0.0313 at 293.2 K and by Gerrard (10) as 0.078 at 273.2 K. These values are similar in magnitude to values reported for the solubility of ammonia in benzene at the same temperatures and therefore the two values may be accepted as tentative values. However it would be unwise to extrapolate these values to obtain solubilities outside the range 273 K to 293 K. Henry's law constants for solubility in 1-methylnaphthalene are reliable for calculation of mole fraction solubilities to a pressure of about 1 atm. Alcohols

The mole fraction solubility in alcohols and other compounds containing one or more -OH groups is high in comparison with the solubility in other liquids at the same temperature and partial pressure of ammonia. This may be due to the effect of hydrogen bonding between hydroxyl groups and nitrogen atoms in ammonia molecules. There is a general tendency for the mole fraction solubility in straight chain aliphatic alcohols to decrease with increase in length of the hydrocarbon chain. The mole fraction solubility is increased markedly if two or more hydroxyl groups are present in a solvent molecule. Ammonia has also a high solubility in chloro-substituted ethanols. This is consistent with a decrease of electron density at the oxygen atom with the replacement of hydrogen atoms by chlorine atoms.

#### Methanol; CH4O; [67-56-1]

Solubilities at eight temperatures from 273.2 K to 313.2 K were determined by Hatem (11) at a total pressure equal to barometric pressure (unspecified). A single value at 291.2 K determined by Kuznetsov *et al.* (7) corresponds to a partial pressure of 1 atm. The values given by de Bruyn (12) for seven temperatures from 273.2 K to 301.6 K also correspond to a total pressure equal to barometric pressure as does the measurement by Delépine (13) at 273.2 K. Mole fraction solubilities at a partial pressure of 1 atm at three temperatures, corrected for the vapor pressure of the solvent and interpolated where necessary, are shown in Table 1. The single measurement by Delépine can be disregarded.

	ated and correct		
273.2	288.2	291.2	
0.49	0.35	0.33	
0.47	0.36	0.34	
		0.35	
0.44			
	273.2 0.49 0.47	273.2       288.2         0.49       0.35         0.47       0.36	0.49 0.35 0.33 0.47 0.36 0.34 0.35

Ammonia Solubilities

COMPONENTS:	EVALUATOR:
(l) Ammonia; NH <sub>3</sub> ; [7664-41-7] (2) Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

#### CRITICAL EVALUATION:

Considering the early date at which it was done, there is reasonable agreement between the work by de Bruyn and the later work by Hatem but the latter is likely to be the more reliable with better temperature control and probably better estimations of equilibrium concentrations. Kuznetsov *et al.* (7) were able to control temperatures to only  $\pm$  0.5 K. Poor temperature control may explain why the solubility measured at 291.2 K by these workers differs from the solubility reported by Hatem. There may also be differences in the way in which correction for the vapor pressure of the solvent has been made. It is recommended that the values given by Hatem, corrected to allow for the vapor pressure of the solvent, should be accepted as tentative values of the solubility at a partial pressure of 1 atm. These "corrected" values fit the equation:

-RT ln  $x_{\rm NH_{*}}$  = -11570 + 48.68(T/K).

The use of this equation outside the range 273.2 K to 313.2 K is not recommended.

#### Ethanol; C<sub>2</sub>H<sub>6</sub>O; [64-17-5]

There is great discrepancy between the solubilities given by different workers. Barclay and Butler (14) carried out measurements at partial pressures of ammonia of about 10 mmHg. Extrapolation of these measurements to 760 mmHg is unlikely to give reliable estimation of solubility at this pressure and comparison with solubilities measured at 760 mmHg cannot be made. The solubility reported by Kuznetsov *et al.* (7) can be disregarded because the ethanol was only 92% pure. The purities of the ethanol used in the early work by Delépine (13) and in that by de Bruyn (12) were not stated but ethanol of high quality seems to have been used by Hatem (11). Values given by Hatem may therefore be more reliable than those reported by other workers even though the former do not conform to the general trend for monohydric straight-chain aliphatic alcohols. It should be noted, however, that ethanol shows a similar anomaly when the reported solubilities of diethylamine in various straight-chain alcohols are compared.

#### 1-Propanol; C<sub>3</sub>H<sub>8</sub>O; [71-23-8]

Solubilities were measured by Hatem (11) at seven temperatures from 273.2 K to 308.2 K at a total pressure equal to barometric pressure. The interpolated value at 291.2 K, corrected for the vapor pressure of the solvent, differs by 8% from the single value obtained by Kuznetsov  $et \ al.$  (7) but the Hatem values can be tentatively accepted.

#### 2-Propanol; C<sub>3</sub>H<sub>8</sub>O; [67-63-0]

Solubilities were also measured by Hatem (11) at seven temperatures from 273.2 K to 308.2 K at a total pressure equal to barometric pressure. The interpolated value at 291.2 K, corrected for the vapor pressure of the solvent, is close to the single value given by Kuznetsov *et al.* (7). The Hatem values can therefore be accepted as tentative values.

## 1-Butanol; C4H100; [71-36-3]

Short *et al.* (15) measured solubilities in this solvent at three temperatures from 263.2 K to 333.2 K and a total pressure equal to 1 atm and corrected these measurements to give solubilities when the partial pressure of ammonia is 1 atm. The interpolated solubility at 273.2 K agrees with the value given by Maladkar (16) when the latter is corrected

COM ONEN 15:		
(1) Ammonia;	NH <sub>3</sub> ;	[7664-41-7]

(2) Organic liquids

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EVALUATOR:
P. G. T. Fogg,
School of Chemistry,
Polytechnic of North London,
Holloway,
London, U.K.
January 1984
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CRITICAL EVALUATION:

for the vapor pressure of the solvent. The solubility at 291.2 K interpolated from the values given by Short *et al*. is within 8% of the value given by Kuznetsov *et al*. The values of Short *et al*. can be accepted as reliable.

2-Butanol; C<sub>4</sub>H<sub>10</sub>O; [78-92-2]

Maladkar (16) measured the solubility at 273.2 K and a total pressure of 1 atm. The value obtained is lower than the corresponding value for 1-butanol just as values for 2-propanol are lower than values for 1-propanol. There is no reason to question the value given by Malakdar and it should be accepted as a provisional value.

2-Methyl-1-propanol; C<sub>4</sub>H<sub>10</sub>O; [78-83-1]

The single solubility measurement at 291.2 K and a partial pressure of 1 atm given by Kuznetsov *et al.* (7) is close to the value which they quote for 1-propanol. It should be borne in mind that temperature control was no better than  $\pm$  0.5 K and such an uncertainty in the temperature leads to an uncertainty in the mole fraction solubility quoted for 291.2 K of about  $\pm$  0.01.

3-Methyl-1-butanol; C<sub>5</sub>H<sub>12</sub>O; [123-51-3]

The mole fraction solubility calculated from measurements by Kuznetsov *et al.* (7) at the single temperature of 2-8.2 K and 1 atm is close to the value of the mole fraction solubility for 1-butanol under the same conditions. The solubility as measured by Kuznetsov can be accepted on a tentative basis with an estimated error in the mole fraction solubility of  $\pm$  0.01 due to uncertainty in the temperature.

Octanol; C<sub>8</sub>H<sub>18</sub>O; [111-87-5]

The value determined by Gerrard and Maladkar (10) at 273.2 K and a total pressure of 1 atm fits into the general pattern of results for aliphatic alcohols and can be accepted as a tentative value.

Cyclohexanol; C<sub>6</sub>H<sub>12</sub>O; [108-93-0]

The mole fraction solubility from work by Cauquil (17) at 299.2 K and 755 mmHg is about half the value for a straight-chain monohydric alcohol. In view of this and of the primitive nature of the apparatus which was used, the measurement should be used with great caution.

2-Amino ethanol; C<sub>2</sub>H<sub>7</sub>NO; [141-43-5]

The mole fraction solubility at 290.2 K and a partial pressure of l atm calculated from data published by Kuznetsov  $et \ al$ . (7) is lower than the solubility in ethanol under these conditions. This lower solubility is consistent with an increase in the electron density at the oxygen atom and with competition between amino groups and ammonia leading to a reduced tendency for hydrogen bonding to take place between oxygen and ammonia. The value can be accepted as a tentative value.

1,2-Ethanediol (Ethylene glycol); C<sub>2</sub>H<sub>6</sub>O<sub>2</sub>; [107-21-1]

The solubility in this solvent at 263.2 K, 298.2 K and 333.2 K and a partial pressure of 1 atm were measured by Short *et al.* (15). Mole fraction solubilities are about twice the values for monohydric alcohols under the same conditions, showing the importance of the hydroxyl groups (cont.)

6

COMPONENTE .

Ammonia Solubilities

COMPONENTS:	EVALUATOR:
<ol> <li>(1) Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>(2) Organic liquids</li> </ol>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

CRITICAL EVALUATION:

in determining the solubility. The values for 298.2 K and 333.2 K lie close to the values of the mole fraction solubilities in diethylene glycol under the same conditions as calculated from data published by Timonin *et al.* (18). The measurements by Short *et al.* (15) therefore appear to be reliable and may be accepted as tentative values.

2,2'-Oxybisethanol (diethylene glycol); C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>; [111-46-6]

Measurements of solubilities in diethylene glycol were made by Timonin *et al.* (18) at four temperatures from 298.2 K to 343.2 K and pressures from 0.025 atm to 32.3 atm. As mentioned above, mole fraction solubilities for a pressure of 1 atm are close to values for ethylene glycol. The higher pressures reached are close to the vapor pressure of liquid ammonia. At temperatures above 298.2 K plots of  $x_{\rm NH_3}$  against  $p_{\rm NH_3}$ cross the reference line (line following Raoult's law). In terms of Raoult's law this means that there is a change from negative deviation to positive deviation as the pressure is increased. Such behavior has been reported for other systems and there seems to be no reason to doubt the measurements reported by Timonin *et al.* (18) which may be accepted as reliable values.

1,2,3-Propanetriol (glycerol); C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>; [56-81-5]

The mole fraction solubility at 291.2 K and a partial pressure of ammonia of 1 atm may be calculated from the mole ratio solubility given by Kuznetsov *et al.* (7). The value is close to that for ethylene glycol and for diethylene glycol under the same conditions with little apparent change in the solubility due to the presence of the extra hydroxyl group. However there is no reason to question the value which should be accepted on a tentative basis.

#### <u>Chloroethanols</u>

2-Chloroethanol; C<sub>2</sub>H<sub>5</sub>ClO; [59826-67-4]: 2,2-Dichloroethanol; C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>O; [598-38-9]: 2,2,2-Trichloroethanol; C<sub>2</sub>H<sub>3</sub>Cl<sub>3</sub>O; [115-20-8]

Replacement of hydrogen atoms in the methyl group of ethanol by chlorine atoms is likely to reduce the electron density on the oxygen atom and hence increase the tendency towards hydrogen bonding between oxygen and dissolved ammonia. Measurements of solubilities at 273.2 K and a total pressure of 1 atm have been reported by Gerrard and Maladkar (10). Mole fraction solubilities are greater than the value for ethanol under the same conditions and are close to the value for ethylene glycol and for diethylene glycol. There is also an increase in the mole fraction solubility with increase in the number of chlorine atoms which one would expect. Values should be accepted on a tentative basis because they fit in with the general pattern of solubility data.

Other compounds containing oxygen

2-Propanone; C<sub>3</sub>H<sub>6</sub>O; [67-64-1]: Cyclohexanone; C<sub>6</sub>H<sub>10</sub>O; [108-93-0]

Careful measurements of the solubility of ammonia in acetone at 1 atm and temperatures of 263.2 K and 298.2 K have been carried out by Short *et al.* (15). The interpolated value of the mole fraction solubility at 292.2 K is 0.096 compared with the value of 0.28 calculated from measurements by Kuznetsov *et al.* (7) at this temperature. The dis-

(cont.)

COMPONENTS:	EVALUATOR:
(l) Ammonia; NH <sub>3</sub> ; [7664-41-7] (2) Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

crepancy could be due to chemical reaction between acetone and ammonia during Kuznetsov's measurement. The measurements by Short *et al.* are likely to be the more reliable. Kuznetsov *et al.* (7) have also given a value for the solubility of ammonia in cyclohexanone but this has not been compiled because the formation of a solid precipitate was mentioned.

1-Methyl-2-pyrrolidinone; C<sub>5</sub>H<sub>9</sub>NO; [872-50-4]

The solubilities of ammonia in 1-methyl-2-pyrrolidinone at numerous temperatures and pressures have been reported by Freidson *et al.* (19). The measurements are self-consistent and there is no reason to doubt the reliability of the work.

1,1'-Oxybisoctane; C16H34O; [629-82-3]

The mole fraction solubility of ammonia in 1,1'-oxybisoctane (dioctyl ether) reported by Gerrard and Maladkar (10) is close to that for the mole fraction solubility in hydrocarbons of similar carbon number. There is no reason to doubt the value which may be accepted on a tentative basis.

Acetic acid, octyl ester; C10H20O; [112-14-1]

The solubility of ammonia in octyl acetate has also been measured by Gerrard and Maladkar (10). This value may also be accepted as a tentative value because there is again no reason to doubt its reliability.

1,4-Dioxane; C<sub>4</sub>H<sub>8</sub>O<sub>2</sub>; [123-91-1]

The Ostwald coefficient for ammonia in 1,4-dioxane was measured at an unspecified pressure and about 297 K by Hentz and Sherman (8) but no great reliance can be placed on the value until it is supported by other measurements on the same system.

Phosphorous acid, triphenyl ester;  $C_{1\,\theta}H_{1\,5}O_{3}P$ ; [101-02-0]: Phosphorous acid, triethyl ester;  $C_{6}H_{1\,5}O_{3}P$ ; [122-52-1]: Phosphorous acid, dibutyl ester;  $C_{8}H_{1\,9}O_{3}P$ ;

The solubilities in esters of phosphorous acid were studied by Maladkar (16). The measurements appear to be reliable and should be accepted on a tentative basis. The appreciable difference between the apparent mole fraction solubility in the dibutyl ester of phosphorous acid and that in the triethyl ester can be explained as being due to the presence of a free hydroxy group in the former solvent which is absent in the latter.

Phosphoric acid, tributyl ester; C<sub>12</sub>H<sub>27</sub>O<sub>4</sub>P; [126-73-8]

The solubility of ammonia in tributyl phosphate was measured by Hála and Tuck (20) at 1 atm and several temperatures. The mole fraction solubility calculated from these measurements for 1 atm and 273.2 K is close to the value from measurements on the dibutyl ester of phosphorous acid reported by Maladkar (16). Measurements by Hála and Tuck can be accepted as tentative values.

8

(cont.)

COMPONENTS:	EVALUATOR:
<ul> <li>(1) Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>(2) Organic liquids</li> </ul>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K.
	January, 1984

1,2,3-Propanetriol, triacetate (glyceryl triacetate); C<sub>9</sub>H<sub>14</sub>O<sub>6</sub>; [102-76-1]

The mole fraction solubilities of ammonia in glyceryl triacetate, calculated from measurements by Furmer  $et \ al$ . (21) are similar in magnitude to values for solubilities in other esters. This work by Furmer  $et \ al$ . can also be accepted on a tentative basis.

Triethoxysilane; C<sub>6</sub>H<sub>16</sub>O<sub>3</sub>Si; [998-30-1]

The mole fraction solubility of ammonia in triethoxysilane has been measured at various pressures and temperatures by Ditsent and Zolotareva (22). This is a consistent set of measurements which appear to be reliable and which should be accepted on a tentative basis.

Chloro-compounds

Tetrachloromethane; CC14; [56-23-5]: 1,2-Dichloroethane; C2H4C12; [107-06-2]

Bell (2) has given the mole fraction solubility in tetrachloromethane at 293.2 K and 1 atm partial pressure of ammonia as 0.0281. This value is close to values for aliphatic hydrocarbons. The value given by Bell for 1,2-dichloroethane under the same conditions is 0.0797. This increase can be explained as being due to a tendency for hydrogen bonding to occur between the hydrogen atoms of the solvent and the nitrogen atoms of the ammonia. There is no reason to question either the value given for tetrachloromethane or for 1,2-dichloroethane which may be accepted as tentative values.

Trichloromethane; CHCl<sub>3</sub>; [67-66-3]

The solubility in trichloromethane was measured by Bell (2) at 293.2 K. The mole fraction solubility at a partial pressure of ammonia of 1 atm was reported to be 0.193. Seward (23) measured the solubility in this solvent at 298.2 K and at a pressure range from 14 mmHg to 453 mmHg. Extrapolation of Seward's results to 1 atm indicates a mole fraction solubility of 0.141 at 298.2 K and a partial pressure of ammonia of 1 atm. Hydrogen bonding between solvent and solute would be expected to lead to a high solubility of ammonia in trichloromethane but the apparent large change in solubility with a change of temperature from 293.2 K to 298.2 K must be viewed with caution and little reliance can be placed upon extrapolations to other temperatures.

1-Chlorooctane; C<sub>8</sub>H<sub>17</sub>Cl; [111-85-3]

The mole fraction solubility in 1-chlorooctane at 273.2 K and 1 atm has been measured by Gerrard and Maladkar (10). The value is greater than that for alkanes of similar chain length but less than that for trichloromethane. There is no reason to doubt the value which may be accepted as tentative.

Chlorobenzene;  $C_6H_5C1$ ; [108-90-7]

The solubility in chlorobenzene at 1 atm partial pressure of ammonia has been measured at 263.2 K, 298.2 K and 333.2 K by Short *et al.* (15). The interpolated value of the mole fraction solubility at 293.2 K is about 5% higher than the value reported by Bell (2) for this temperature.

(cont.)

COMPONENTS :	EVALUATOR:
<ul> <li>(1) Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>(2) Organic liquids</li> </ul>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. January 1984

The values reported by Short *et al*. are likely to be reliable. Comparison of these measurements with values for benzene reported by Noda *et al*. (9) shows that the introduction of a chlorine atom into the benzene nucleus may cause an increase in the mole fraction solubility. This would be consistent with the polarity of chlorobenzene.

Bromobenzene; C<sub>6</sub>H<sub>5</sub>Br; [108-86-1]

The mole fraction solubility of ammonia in bromobenzene was measured at 293.2 K by Bell (2) and the value for a partial pressure of 1 atm was reported. In this case the value is slightly less than the mole fraction solubility in benzene from Noda's measurements but the reliability of this single value for bromobenzene cannot be judged.

Chloromethylbenzene; C<sub>7</sub>H<sub>7</sub>Cl; [100-44-7]

Bell also reported the mole fraction solubility in chloromethylbenzene at 293.2 K and 1 atm partial pressure. The value appears to be greater than the corresponding values for benzene and for methylbenzene as would be expected from its polarity and there is no reason to question the value which may be accepted on a tentative basis.

Compounds containing nitrogen

Hydrazine;  $N_2H_4$ ; [302-01-2]: Methylhydrazine;  $N_2H_3CH_3$ ; [60-34-4]: 1,1-Dimethylhydrazine;  $N_2H_2C_2H_6$ ; [57-14-7]

Mole fraction solubilities in hydrazine, methylhydrazine and 1,1dimethylhydrazine were measured at three temperatures and several partial pressures of ammonia by Chang *et al.* (24). At each temperature, values of mole fraction solubilities, when plotted against the partial pressure of ammonia, fall on smooth curves through the origin and through  $x_{\rm NH_3} = 1$ ;  $p_{\rm NH_3} =$  vapor pressure of liquid ammonia at the temperature of measurement. For each compound interpolated values of  $x_{\rm NH_3}$  for  $p_{\rm NH_3}=1$  atm fit closely to equations of the form:

-RT ln  $x_{\rm NH_2}$  = a + b(T/K).

There is no reason to doubt the reliability of these measurements.

Benzenamine; C<sub>6</sub>H<sub>7</sub>N; [62-53-3]

The mole fraction solubility in benzenamine (aniline) at a total pressure equal to barometric pressure and at six temperatures from 298.2 K to 423.2 K may be calculated from solubilities given by Stoica *et al.* (25). Extrapolation of these mole fraction solubilities to 291.2 K gives a value of 0.148 which may be compared with the value at this temperature given by Kuznetsov *et al.* (7) of 0.13. The vapor pressure of aniline made an appreciable contribution to the total pressure at the higher temperatures at which Stoica's measurements were carried out.

If corrections are made for the vapor pressure of aniline then the mole fraction solubilities at a partial pressure of 1 atm from measurements by Stoica *et al.* may be accepted as tentative values. These values fit the equation:

COMPONENTS:	EVALUATOR:
(l) Ammonia; NH <sub>3</sub> ; [7664-41-7] (2) Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K.
	January 1984

-RT ln  $x_{\rm NH}$  = -25180 + 101.1(T/K)

(Standard deviation of -RT ln  $x_{\rm NH_{2}} = 643 \text{ J mol}^{-1}$ )

This equation should be used with caution outside the range 298.2 K to 423.2 K.

N, N-Diethylethanamine (triethylamine); C<sub>6</sub>H<sub>15</sub>N; [121-44-8]

The mole fraction solubility in triethylamine at 294.2 K and a partial pressure of ammonia of 1 atm may be calculated from measurements by Kuznetsov (7) to be 0.08. This is about half the value for the solubility in aniline at the same temperature. There is, however, no reason to doubt this value for triethylamine but there are no measurements on closely similar systems with which to make comparisons.

#### Quinoline; C<sub>9</sub>H<sub>7</sub>N; [91-22-5]

Kuznetsov *et al.* (7) have also made a single measurement of the solubility in quinoline at 291.2 K and 1 atm. The mole fraction solubility has been calculated to be 0.06, less than the value for triethylamine but slightly greater than the apparent value of 0.04 for benzene under the same conditions. The value for quinoline must be accepted as a tentative value because no proper evaluation can be carried out.

Hexanedinitrile; C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>; [111-69-3]

The solubility of ammonia in hexanedinitrile (adiponitrile) at several temperatures and pressures from about 70 mmHg to about 16 atm has been measured by Freidson *et al.* (26). These measurements correspond to a consistent set of values of mole fraction solubilities and seem to be reliable. However they should be accepted on a tentative basis because measurements on closely related systems are not available for comparison.

<u>Compounds containing silicon</u> Tetramethylsilane; C<sub>4</sub>H<sub>12</sub>Si; [75-76-3]

The Ostwald coefficient for dissolution of ammonia in tetramethylsilane was measured by Horsman-van den Dool and Warman (4) at 292.9 K and an unspecified pressure. The value is within the range found for dissolution in hydrocarbons but little reliance can be placed on this single value until other measurements on this or similar systems are available for comparison.

#### References

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 J. Amer. Chem. Soc. <u>1923</u>, 45, 682.

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COMPONE	NTS:	EVALUATOR:		
	mmonia; NH <sub>3</sub> ; [7664-41-7]	P. G. T. Fogg, School of Chemistry,		
(2) 0	rganic liquids	Polytechnic of North London, Holloway, London, U.K.		
		January 1984		
CRITICA	L EVALUATION:			
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COMPONENTS:	ORIGINAL MEASUREMENTS:		
l. Ammonia; H <sub>3</sub> N; [7664-41-7]	Bell, R. P.		
2. Hydrocarbons	J. Chem. Soc.		
	<u>1931</u> , 1371-82.		
VARIABLES:	PREPARED BY:		
	P. G. T. Fogg		
EXPERIMENTAL VALUES:			
Columnia (	Partition Mole coeff. fraction		
Solvent	$dm^{-3}(solp)/$		
mol <sub>N</sub>	$x_{\rm NH_3}$ (latm) $x_{\rm NH_3}$ (latm)		
Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	4.16 0.0223		
*Octane; C <sub>8</sub> H <sub>18</sub> ; [111-65-9]	2.56 0.0170		
*Dodecane; C <sub>12</sub> H <sub>26</sub> ; [112-40-3]	2.13 0.0197		
*Hexadecane; $C_{16}H_{34}$ ; [544-76-3]	1.84 0.0219		
Benzene; C <sub>6</sub> H <sub>6</sub> ; [71-43-2]	9.95 0.0474		
Methylbenzene; C <sub>7</sub> H <sub>8</sub> ; [108-88-3]	7.23 0.0313		
Temperature = 293.2 K l atm = 1.015 x 10 <sup>5</sup> Pascal * Unpublished measurements by Brönsted and Volqvartz reported by Bell.			
AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE	SOURCE AND PURITY OF MATERIALS		
Ammonia at barometric pressure was passed through the solvent in a graduated glass vessel for about 3 hours. The temperature was con-	Solvents "zur Analyse" grade from Merck or Kahlbaum; dried over CaCl <sub>2</sub> and distilled.		
trolled to ±0.01 K by a thermostat bath. Dissolved ammonia in a	C <sub>6</sub> H <sub>14</sub> : b.p. 67.1 - 67.6°C		
measured volume of solution was removed by a current of air over a	C <sub>6</sub> H <sub>6</sub> : b.p. 79.60 - 79.65°C		
period of 8-10 hours, trapped in U-tubes containing hydrochloric acid and estimated by titration. Solu-	C <sub>7</sub> H <sub>8</sub> : b.p. 110.0 - 111.0°C.		
bilities were corrected to 1 atm by making corrections for the vapor pressure of the solvent, barometric pressure and hydrostatic pressure of liquid in the absorption vessel. Mole fraction solubilities were calculated by the author on the assumption that densities of solutions obey the ideal mixture law.	The author stated that measurements were reproducible to within 1%.		

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COMPONENTS :	ORIGINAL MEASUREMENTS:
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. Hexane; C<sub>6</sub>H<sub>14</sub>; [110-54-3]</pre>	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G.
	Zh. Prikl. Khim. <u>1978</u> , 51, 1296- 1300.
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
τ/κ <sup>ά</sup> α	Mole fraction of ammonia at a partial pressure of 101.325 kPa <sup>x</sup> NH <sub>3</sub>
298.15 2.48	0.01457
one volume of solvent when the par	rtial pressure of gas was 101.325 kPa.
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a	
static method previously described by	Purity better than 99 mole per
Bodor et al. (ref. 1). However,	cent as determined by gas
Bodor et al. described apparatus for	chromatography.
use below 0 °C but referred to	
another paper (ref 2.) in which an	
apparatus for use above 0 °C was	
described. Bodor <i>et al.</i> stated that,	
in each case, the volume of gas	ESTIMATED ERROR:
absorbed by a given quantity of liquid	
at a particular pressure was measured	
by a gas burette. Bodor <i>et al.</i> gave	REFERENCES :
details of a method of calculating gas solubilities, applicable to	1. Bodor, E.; Bor, G. J.; Mohai, B.;
either apparatus, with allowance for	Sipos, G. Veszpremi. Vegyip. Egy. Kozl. <u>1957</u> , 1, 55.

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COMPONENTS: (1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	ORIGINAL MEASUREMENTS: Horsman-van den Dool, L. E. W.;	
(2) Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	Warman, J. W.	
2,2,4-Trimethylpentane or iso-	Interuniversity Reactor Institute (IRI)-Report 134-81-01	
octane; C <sub>8</sub> H <sub>18</sub> ; [540-84-1]	(TVT)_VEDOLC 124-01-01	
VARIABLES:	PREPARED BY:	
T/K = 292.4	H. L. Clever	
p <sub>1</sub> /kPa not given	1	
EXPERIMENTAL VALUES:		
Temperature Ostwald		
t/°C T/K L/	of Runs /cm <sup>3</sup> cm <sup>-3</sup>	
Hexane 19.2 292.4	2.51 2	
2,2,4-Trimethylpentane 19.2 292.4	2.45 2	
	2.15 2	
	· · ·	
AUXILIARY	INFORMATION	
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is	(1) Ammonia. Baker Chemical Co.	
partly filled with solvent and closed		
with a half-hole septum. An amount of the gaseous solute is added to the	(2) Hexane and 2,2,4-Trimethylpentane. Both Merck, Uvasol Spektroskopie	
container. The closed container is shaken for 30 minutes. Samples of	grade. Impurities which give the	
both the vapor and liquid phases are taken in calibrated syringes. The	same retention time as the gas are removed before the experiment	
samples are injected into a gas chromatograph. The Ostwald coeffici-	by adsorption or distillation.	
ent is calculated from the known sample size and the measured peak	ESTIMATED ERROR:	
areas.	$\delta L/L = \pm 0.05$	
The chromatograph is a Hewlett-		
Packard model 5750 equiped with a thermal conductivity cell detector.	REFERENCES :	
The carrier gas is helium. A 90 cm column packed with Porapak Q coated-		
with 10 percent polyethyleneimine is used for the separation.		

COMPONENTS: ORIGINAL MEASUREMENTS: 1. Ammonia; NH ; [7664-41-7] Gerrard, W. "Solubility of Gases and Liquids", 2. Various organic liquids. Plenum Press, New York, 1976, pp.164-165. VARTABLES . PREPARED BY: P. G. T. Fogg Temperature, pressure EXPERIMENTAL VALUES: The general pattern of variation of mole fraction of NH<sub>3</sub> with variation of pressure of NH3 from 0-1 atm at 273.2 K has been presented in graphical form for the following liquids: Benzenamine; C<sub>6</sub>H<sub>7</sub>N; [62-53-3] Decane;  $C_{10}H_{22}$ ; [124-18-5] 1,3,5-Trimethylbenzene; C<sub>9</sub>H<sub>12</sub>; Octanol; C<sub>8</sub>H<sub>18</sub>O; [29063-28-3]\*\* [108-67-8] Benzenemethanol; C<sub>7</sub>H<sub>8</sub>O; *N*,*N*-Diethylbenzenamine; C<sub>10</sub>H<sub>15</sub>N; [100-51-6] $[91 - \overline{6}6 - 7]$ 2,2,2-Trichloroethanol; C<sub>2</sub>H<sub>3</sub>Cl<sub>3</sub>O 1,1'-Oxybisoctane; C16H34O; [115 - 20 - 8][629-82-3]\* Benzeneethanamine; C<sub>8</sub>H<sub>11</sub>N; [64-04-0] 1-Octanamine; C<sub>8</sub>H<sub>19</sub>N; [111-86-4] Trichloromethane; CHCl<sub>3</sub>; [67-66-3] N,N-Dimethylformamide; C<sub>3</sub>H<sub>7</sub>NO; [68 - 12 - 2]The mole fraction of NH $_3$  at 1 atm and 293.2 K has been given in graphical form for the following liquids: Hexadecane; C<sub>16</sub>H<sub>34</sub>; [544-76-3] Octane; C<sub>8</sub>H<sub>18</sub>; [111-65-9] Dodecane;  $C_{12}H_{26}$ ; [112-40-3] formula incorrectly printed as  $(n-C_{18}H_{17})_2O;$ formula incorrectly printed as  $n-C_6H_7OH$ . Correct formulae are given in the manuscript copy of the book held at the Polytechnic of North London. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: Adsorption at barometric pressure was measured by bubbling ammonia through a weighed quantity (about 2 g) of solvent in a glass vessel Not given. held in a thermostat until saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. ESTIMATED ERROR: Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at barometric pressure were allowed to come to equilibrium **REFERENCES:** under a lower pressure of ammonia. 1. Gerrard, W. Details of the apparatus are given "Solubility of Gases and Liquids" in ref. (1). Plenum Press, New York, 1976, pp.3-5.

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			Jolubilities	17
COMPONENTS:			ORIGINAL MEASUREMENTS	;
l. Ammonia; N	H <sub>3</sub> ; [7664-4	1-7]	Tremper, K.K.; Pr	ausnitz, J.M.
2. Hexadecane [544-76-3]	; C <sub>16</sub> H <sub>34</sub> ;		J. Chem. Engng. L	0ata <u>1976</u> , 21, 295-9
VARIABLES:			PREPARED BY:	
_			Q I Vouna	
Temperature			C.L. Young	
EXPERIMENTAL VALU	ES:			
т/к		Henry's /at	m	Mole fraction <sup>b</sup> of ammonia at l atm partial pressure, <sup>x</sup> NH <sub>3</sub>
300		45.	8	0.0218
325		59.	0	0.0169
350		73.	4	0.0136
375		87.	6	0.0114
400		100.	0	0.0100
425		112.	0	0.00893
450		122.	0	0.00820
475		129.	0	0.00775
a.		of solubilit	ents were made at y used were all wi	
b.	Calculated Mole fract	by compiler ion and press	assuming linear re ure.	lationship between
		AUXILIARY	INFORMATION	
METHOD/APPARATUS/			SOURCE AND PURITY OF	MATERIALS:
Volumetric appa described by Dy (1). Pressure detector and pu in ref. (2).	ymond and Hi measured wi	lldebrand Lth a null	Solvent degass details given.	ed. No other
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;$	δ <i>x</i> <sub>NH 3</sub> =±1%
			REFERENCES: 1. Dymond, J.; Hil Ind.Chem.Eng.Fundo 2. Cukor, P.M.; Pi Ind.Chem.Eng.Fundo	am. <u>1967.6</u> ,130. causnitz, J.M.

COMPONENTS:		ORIGINAL MEASUREMENTS:
l. Ammonia; NH <sub>3</sub>	; [7664-41-7]	Messow, U.; Pape, D.
2. Kerosine		Pol. J. Chem.
		<u>1980, 54, 2001-2009.</u>
VARIABLES:		PRI PARED BY:
Te	mperature .	P. G. T. Fogg
EXPERIMENTAL VALUES:		
	T/K Mole fraction (1 atm), $x_{\rm NH_3}$	
	303.2	0.02513
	333.2 363.2	0.01698 0.01227
	Total pressure = 1	$atm = 1.013 \times 10^5 Pa.$
The authors stat	ed that the kerosine	had the following properties:
	Average molecular v	weight/g mol <sup>-1</sup> = 209
	Average b.p./K = 4	
		$^{\circ}C/cm^{3} mol^{-1} = 257.75$
	AUXILIARY	INFORMATION
		SOURCE AND PURITY OF MATERIALS:
The authors claimed to have made		
measurements in the pressure range		No details given.
from 1 atm to 10 atm but no further		
experimental results or details were		
given.		
		ESTIMATED ERROR:
		RLFERENCES:

COMPONENTS :	ORIGINAL MEASUREMENTS:
l. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Messow, U.; Pape, D.
2. Diesel fuel	Pol. J. Chem.
	<u>1980</u> , <i>54</i> , 2001-2009.
VARIABLES:	PREPARED BY:
Temperature	P. G. T. Fogg
EXPERIMENTAL VALUES:	J
T/K Mole	e fraction (1 atm), $x_{\rm NH_3}$
303.2	0.02127
333.2 363.2	0.01577 0.01195
Total pressure	$a = 1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$
	diesel fuel had the following
properties:	•
Average molecu	lar weight/g $mol^{-1} = 234$
Average b.p./K	= 553
Molar volume a	t 25 °C/cm <sup>3</sup> mol <sup>-1</sup> = 300.12
	LIARY INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
The authors claimed to have made	
measurements in the pressure rand	
from 1 atm to 10 atm but no furt	her
experimental results or details	were
given.	
	ESTIMATED ERROR:
	RI FERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	Hentz, R. R.; Sherman, W. V.
(2) Cyclohexane; C <sub>6</sub> H <sub>12</sub> ; [110-82-7]	J. Phys. Chem. <u>1968</u> , 72, 2635-41.
1,4-Dioxane; C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> ; [123-91-1]	<u> </u>
$1/4$ bioxane, $0_4 n_8 0_2$ , [123 51 1]	
VARIABLES: $T/K = 297$	PREPARED BY:
$p_1/kPa$ not given	H. L. Clever
EXPERIMENTAL VALUES:	
Temperature Os	
<i>t/°C T/K</i>	L/cm <sup>3</sup> cm <sup>-3</sup>
Cyclohexane	
~24 ~297	2.0
l,4-Dioxane	
~24 ~297	17.
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The apparatus consisted of a	(1) Ammonia. Matheson Co., Inc.
solvent bulb, a gas and mixing bulb of known volume, and a manometer.	Purified by three trap to trap distillations. Degassed by pumping
A 100 cm <sup>3</sup> sample of solvent was	at -196 °C.
placed in the solvent bulb. It was	(2) Cyclohexane. Fisher. Spectro- analyzed grade. Passed through
degassed by repeated pumping and shaking. The solvent was brought to	silica gel, stored over sodium. 1,4-Dioxane. Matheson, Coleman &
the temperature of the measurement and its vapor pressure measured.	Bell. Spectroscopic reagent.
Gas was added to the gas and mixing	Passed over alumina, refuxed over Na under $N_2$ , distilled.
bulb, and its pressure measured. The	ESTIMATED ERROR:
gas was condensed. The degassed solvent was transferred to the bulb.	$\delta L/L = \pm 0.10$ (authors)
The bulb contents were brought back to the temperature of the measurement	
and shaken vigorously to establish equilibrium. The pressure was	
measured and the Ostwald coefficient	REFERENCES:
	REFERENCES:
calculated from the decrease in pressure suitably corrected for the	REFERENCES:
calculated from the decrease in	REFERENCES :
calculated from the decrease in pressure suitably corrected for the	REFERENCES :

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COMPONENTS:	ORIGINAL MEASUREMENTS:
l. Ammonia; NH3; [7664-41-7]	Kuznetsov, A. I.; Panchenkov, G. M.;
2. Cyclohexane; C <sub>6</sub> H <sub>12</sub> ; [110-82-7]	Gogoleva, T.V.
	Zh. Fiz. Khim. <u>1968</u> , 42, 982-3.
r	(Russ. J. Phys. Chem. <u>1968</u> , 42,
	510-511).
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	L
T/K P <sub>NH3</sub> /mm	Hg <sup>mol</sup> NH3 <sup>/mol</sup> solvent Mole fraction <sup>*</sup>
292.2 760	0.29 0.22
to about 800 mmHg although only solu reported.	
The authors also stated that Henry's	law in the form:
mol <sub>NH3</sub> /mol <sub>solvent</sub> =	$p_{\rm NH_3} \times {\rm constant}$
was "satisfactorily" obeyed.	•
	•
760 mmHg = 1 a * Calculated by the	tm = 1.013 × 10 <sup>5</sup> Pa.
AUXILIARY	INFORMATION
METHOD 'APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Conventional gas handling apparatus attached to a vacuum line was used.	1. Obtained from a commercial cylinder.
A measured volume of solvent was admitted to the absorption vessel which was fitted with a magnetic	2. "Pure" grade.
stirrer. Portions of ammonia at a measured volume and pressure were then admitted to the absorption vessel and equilibrium pressures in	
this vessel were measured by a mercury manometer. Allowance was	ESTIMATED ERROR:
made for the vapor pressure of the	$\delta T/K = \pm 0.5;  \delta p/\text{mmHg} = \pm 0.5$
solvent but the method of making this allowance was not stated.	(estimated by the authors).
	RLFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>l. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. Cyclohexane; C<sub>6</sub>H<sub>12</sub>; [110-82-7]</pre>	Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. Zh. Prikl. Khim. <u>1978</u> , 51, 1296- 1300.
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
τ/K α <sup>ä</sup>	Mole fraction of ammonia at a partial pressure of 101.325 kPa <sup>x</sup> NH3
298.15 7.52	0.03501
<sup>a</sup> Volume of gas (calculated for 101 one volume of solvent when the pa	.325 kPa and 273.15 K) dissolved by rtial pressure of gas was 101.325 kPa.
AUXILIARY	INFORMATION
METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a static method previously described by Bodor <i>et al.</i> (ref. 1). However, Bodor <i>et al.</i> described apparatus for use below 0 °C but referred to another paper (ref. 2) in which an apparatus for use above 0 °C was described. Bodor <i>et al.</i> stated that, in each case, the volume of gas absorbed by a given quantity of liquid at a particular pressure was measured by a gas burette. Bodor <i>et al.</i> gave details of a method of calculating gas solubilities, applicable to either apparatus, with allowance for the vapor pressure of the solvent.	ESTIMATED ERROR:
	technica Ser. Chem. Eng. (Budapest) 1958, 2, 1.

Ammonia	Solubilities 23
COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	Horsman-van den Dool, L. E. W.; Warman, J. W.
(2) Cyclohexane; C <sub>6</sub> H <sub>12</sub> ; [110-82-7]	Interuniversity Reactor Institute
Methylcyclohexane; C <sub>7</sub> H <sub>14</sub> ; [108-87-2]	(IRI)-Report 134-81-01
VARIABLES: $T/K = 292.5, 297.5$ $p_1/kPa$ not given	PREPARED BY: H. L. Clever
EXPERIMENTAL VALUES:	
Temperature Ostwald	Coefficient Number
-	cm <sup>3</sup> cm <sup>-3</sup>
Cyclohexane	
19.3 292.5	2.36 3
Methylcyclohexane 24.3 297.5	2.48 2
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coefficient is calculated from the known sample size and the measured peak areas.	<ul> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received.</li> <li>(2) Cyclohexane. Merck Uvasol Spektro- skopie grade. Methylcyclohexane. Fluka. UV-Spektrskopie grade. Impurities which gave the same retention time as the gas are removed before the experiment by adsorption or distillation.</li> <li>ESTIMATED ERROR: δL/L = ± 0.05</li> </ul>
The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used for the separation.	REFERENCES:

COMPONENTS :	_	ORIGINAL MEASU	REMENTS:
<ol> <li>Ammonia; NH<sub>3</sub>; [7</li> </ol>	664-41-7]	Tremper, k	K.K.; Prausnitz, J.M.
2. 1,1'-Bicyclohexy [92-51-3]	l; C <sub>12</sub> H <sub>22</sub> ;	J. Chem. E	Engng. Data <u>1976</u> , 21, 295-9
VARIABLES:		PREPARED BY:	
Temperature		C.L. Your	1g
EXPERIMENTAL VALUES:			
т/к	Henry's /at	Constant <sup>a</sup> tm	Mole fraction <sup>b</sup> of ammonia at 1 atm partial pressure, $x_{\rm NH_3}$
300	101	1.0	0.00990
325	168	8.0	0.00595
350	213	3.0	0.00469
375	243	3.0	0.00412
400	265	5.0	0.00377
425	285	5.0	0.00351
450	299	9.0	0.00334
475	304	4.0	0.00329
and v	rs stated measurem alues of solubilit egion.	ments were ma ty used were	ade at several pressures all within the Henry's
b. Calcu mole	lated by compiler fraction and press	assuming lin	near relationship between
		INFORMATION	
METHOD/APPARATUS/PROCEDU	RE:	SOURCE AND PUR	RITY OF MATERIALS;
Volumetric apparatus described by Dymond (1). Pressure measu detector and precisi in ref. (2).	similar to that and Hildebrand red with a null		degassed. No other
			DR: ±0.1; $\delta x_{\rm NH_3} = \pm 1$ %
		Ind.Eng.Chen 2. Cukor, P	J.; Hildebrand, J.H. n.Fundam. <u>1967</u> ,6,130. .M.;Prausnitz, J.M. n.Fundam. <u>1971</u> ,10,638.

Ammonia	Solubilities 25
COMPONENTS:	ORIGINAL MEASUREMENTS:
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	Horsman-van den Dool, L. E. W.; Warman, J. W.
(2) 1,1'-Bicyclohexyl; C <sub>12</sub> H <sub>22</sub> ; [92-51-3]	Interuniversity Reactor Institute (IRI)-Report 134-81-01
VARIABLES:	PREPARED BY:
T/K = 295.6, 301.2 $p_1/kPa$ not given	H. L. Clever
EXPERIMENTAL VALUES:	
Temperature Ostwald (	Coefficient Number
-	of Runs n <sup>3</sup> cm <sup>-3</sup>
22.4 295.6	1.77 2
28.0 301.2	1.70 1
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm	<ul> <li>(1) Ammonia. Baker Chemical Co. Anhydrous, 99.99 percent. Used as received.</li> <li>(2) 1,1'Bicyclohexyl. Fluka. purum grade. Impurities which give the same retention time as the gas are removed before the experi- ment by adsorption or distilla- tion.</li> <li>ESTIMATED ERROR: δL/L = ± 0.05</li> <li>REFERENCES:</li> </ul>
column packed with Porapak Q coated with 10 % polyethyleneimine is used for the separation.	

COMPONENTS:	ORIGINAL MEASUR	EMENTS:	······································
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	Horsman-van		L. E. W.;
(2) cis-Decahydronaphthalene or cis-	Warman, J		
decalin; C <sub>10</sub> H <sub>18</sub> ; [493-01-6]	Interuniver (IRI)-Repor		
<i>trans-</i> Decahydronaphthalene or <i>trans-</i> decalin; C <sub>10</sub> H <sub>18</sub> ; [493-02-7]			
VARIABLES:	PREPARED BY:		
T/K = 300.1, 301.3 p <sub>1</sub> /kPa not given		H. L. Cleve	r
EXPERIMENTAL VALUES:	I		
Temperature Ostwald	Coefficient	Number of Runs	
t/°C T/K L/·	cm <sup>3</sup> cm <sup>-3</sup>		
cis-Decalin			
26.9 300.1	1.78	2	
trans-Decalin			
28.1 301.3	1.94	1	
	INFORMATION		
	INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURI		
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is	SOURCE AND PURI (1) Ammonia Anhydro	. Baker Che us, 99.99 p	
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of	SOURCE AND PURI (1) Ammonia Anhydro as rece	. Baker Che us, 99.99 p ived.	emical Co. Dercent. Used
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) cis-Dec Merck.	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes	mical Co. percent. Used ans-Decalin. e grade.
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as	mical Co. percent. Used ans-Decalin. e grade. tive the same the gas are
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the	mical Co. percent. Used ans-Decalin. e grade. ive the same
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici-	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas.	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed by adso	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed by adso	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector.	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) <i>cis-</i> Dec Merck. Impurit retenti removed by adso	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) $cis$ -Dec Merck. Impurit retenti removed by adso ESTIMATED ERRO $\delta L/L$ =	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) $cis$ -Dec Merck. Impurit retenti removed by adso ESTIMATED ERRO $\delta L/L$ =	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment
METHOD/APPARATUS/PROCEDURE: A cylindrical glass container of approximately 15 cm <sup>3</sup> volume is partly filled with solvent and closed with a half-hole septum. An amount of the gaseous solute is added to the container. The closed container is shaken for 30 minutes. Samples of both the vapor and liquid phases are taken in calibrated syringes. The samples are injected into a gas chromatograph. The Ostwald coeffici- ent is calculated from the known sample size and the measured peak areas. The chromatograph is a Hewlett- Packard model 5750 equiped with a thermal conductivity cell detector. The carrier gas is helium. A 90 cm column packed with Porapak Q coated with 10 % polyethyleneimine is used	SOURCE AND PURI (1) Ammonia Anhydro as rece (2) $cis$ -Dec Merck. Impurit retenti removed by adso ESTIMATED ERRO $\delta L/L$ =	. Baker Che us, 99.99 p ived. alin and tr Zur Synthes ies which g on time as before the rption or d	mical Co. percent. Used ans-Decalin. the grade. tive the same the gas are experiment

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	<u></u>	ORIGINAL MEASUREMENTS:
a; NH3; [7	7664-41-7]	Noda, K.; Morisue, T.; Ishida, K.
exene; C <sub>6</sub> H	I <sub>10</sub> ; [110-83-8]	J. Chem. Eng. Japan. <u>1975</u> , 8, 104-8.
		PREPARED BY:
ture, pres	sure	C.L. Young
VALUES: P/atm	P/kPa	Mole fraction of ammonia In liquid, in vapor,
		<sup>x</sup> <sub>NH<sub>3</sub></sub> y <sub>NH<sub>3</sub></sub>
1.12 1.83 2.09 2.49 3.52 3.80 4.00 4.22 4.21 4.22 1.40 2.45 4.62 5.80 6.46 7.25 7.81 8.34	113 185 212 252 357 385 405 428 427 428 427 428 142 248 468 588 655 735 791 845	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
8.33 8.35 8.38 8.41	844 846 849 852	0.557*       0.984         0.948*       0.988         0.966       0.985         0.978       0.993         0.983       0.993
	AUXILIAR	Y INFORMATION _
s cell fit mple port auge. Com se estimat system and	ted with and Bourdon position of ed from known amounts added.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Commercial product, fractionated    at least four times under    pressure. 2. Commercial sample, distilled    middle fraction used.  ESTIMATED ERROR:</pre>
	ture, pres VALUES: P/atm 1.12 1.83 2.09 2.49 3.52 3.80 4.00 4.22 4.21 4.22 1.40 2.45 4.62 5.80 6.46 7.25 7.81 8.34 8.33 8.33 8.33 8.33 8.33 8.35 8.38 8.41 TUS/PROCEDUR scell fit mple port auge. Com se estimat system and	P/atm       P/kPa       j         1.12       113       1.83       1.85         2.09       212       2.49       252         3.52       357       3.80       385         4.00       405       4.22       428         4.21       427       4.22       428         1.40       142       2.45       248         4.62       468       55       7.25       735         7.81       791       8.34       845         8.33       844       8.35       846         8.38       849       8.41       852         * three phase       * three phase

	Solubilities
COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7]</pre>	Bell, R.P.
2. Aromatic compounds	J. Chem. Soc. <u>1931</u> , 1371-1382.
VARIABLES:	PREPARED BY: C.L. Young
EXPERIMENTAL VALUES:	
Solvent T/K	Partition Mole fraction coefficient, of ammonia in $s^+$ liquid, $x_{\rm NH_3}$
Benzene, C <sub>6</sub> H <sub>6</sub> ; [71-43-2] 293.15	9.95 0.0474
Methylbenzene; (Toluene); C <sub>7</sub> H <sub>8</sub> ; [108-88-3]	7.23 0.0313
Bromobenzene; C <sub>6</sub> H <sub>5</sub> Br; [108-86-1]	8.08 0.0340
Chlorobenzene; C <sub>6</sub> H <sub>5</sub> Cl; [108-90-7]	11.35 0.0423
Chloromethylbenzene; (Benzyl chloride); C <sub>7</sub> H <sub>7</sub> Cl; [100-44-7].	12.20 0.0556
<pre>§ for a partial pressure of 101.32</pre>	25 KFa.
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus consisting of bulb (~50cm <sup>3</sup> capacity) extended at the top as a graduated tube and joined at bottom to a capillary u-tube. Liquid saturated with gas at atmospheric pressure. Gas withdrawn in a current of air, absorbed in hydrochloric acid. Excess hydrochloric acid titrated with sodium hydroxide.	<ol> <li>Obtained from cylinder, no other details given.</li> <li>Merck or Kahlbaum samples dried over calcium chloride and fractionally distilled.</li> </ol>
-	ESTIMATED ERROR: $\delta T/K = \pm 0.1; \ \delta x_{\rm NH_3} = \pm 1$ %. (estimated by compiler) REFERENCES:

000000000000000000000000000000000000000			ODICINAL MELSON	100
COMPONENTS:		- CA AL 71	ORIGINAL MEASUREMEN	
1. Ammonia	a; NH <sub>3</sub> ; [70	564-41-/J	Noda, K.; Mori	sue, T.; Ishida, K.
2. Benzen	e; C <sub>6</sub> H <sub>6</sub> ; [	71-43-2]	J. Chem. Eng.	Japan. <u>1975</u> , 8, 104-8
	-			
VARIABLES:			PREPARED BY:	
Tempera	ature, pres	ssure	с.	L. Young
EXPERIMENTAL V	ALUES:		Mole fracti	on of ammonia
т/К	P/atm	P/kPa	in liquid,	in vapor,
			$x_{ m NH_3}$	${\mathcal{Y}}_{\rm NH_3}$
273.15	1.48	150	0.079*	0.974
	1.73	175	0.112	0.970
	1.84 2.14	186 217	0.122 0.152	0.961
	2.71	275	0.229	0.974
	3.08	312	0.296	0.982
	3.41	346	0.390	0.987
	3.60	365	0.472 0.606	0.984
	3.79 3.86	384 391	0.689	0.988 0.991
	3.93	398	0.793	-
	4.03	408	0.901	0.991
	4.12	417	0.957	0.993
293.15	1.35 2.78	137 · 282	0.046 0.109	0.903 0.964
	3.81	386	0.164	0.979
	5.34	541	0.290	0.981
	6.21	629	0.396	0.992
	6.82	691 728	0.510 0.598	0.991 0.989
	7.18 7.60	728	0.769	0.989
	7.65	775	0.794	0.991
	7.67	777	0.799	0.987
	7.90 8.34	800 845	0.883 0.978	0.993 0.995
	8.34	*three pha		0.995
		AUXILIARY	INFORMATION	
METHOD /APPARA	TUS/PROCEDURE		SOURCE AND PURITY	OF MATERIALS:
		ed with gaseous lon pressure		product, fraction- ast four times under
gauge, Cor			pressure.	
phase estir	nated from	known volume		
of system a	and amounts	added. Gas	2. Guaranteed	reagent sample.
sample anal source.	Lysed by GC	. Details in		
source.				
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.$	02; $\delta P/kPa = \pm 1;$
			$\delta x_{\rm NH_3}$ , $\delta y_{\rm NH_3}$	$H_3 = \pm 0.003.$
			(estimated	by compiler).
			REFERENCES:	
			(estimated	H <sub>3</sub> = ±0.003. by compiler).

COMPONENTS:	ODICINAL NEACUDENSINES.
1. Ammonia; $NH_3$ ; [7664-41-7] 2. Benzene; $C_6H_6$ ; [71-43-2]	ORIGINAL MEASUREMENTS: Patyi, L.; Furmer, I. E.; Makranczy, J.; Sadilenko, A. S.; Stepanova, Z. G.; Berengarten, M. G. 21. Built Whim 1078 51 1286-
	2h. Prikl. Khim. <u>1978</u> , 51, 1296- 1300.
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
τ/κ α <sup>a</sup>	Mole fraction of ammonia at a partial pressure of 101.325 kPa <sup>x</sup> NH <sub>3</sub>
298.15 6.52	0.02573
AUXILIARY	INFORMATION
METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
The authors stated that they used a	
static method previously described by	Purity better than 99 mole per
Bodor <i>et al</i> . (ref. 1). However,	cent as determined by gas
Bodor et al. described apparatus for	chromatography.
use below 0 °C but referred to	
another paper (ref. 2) in which an	
apparatus for use above 0 °C was	
described. Bodor et al. stated that,	
in each case, the volume of gas	ESTIMATED ERROR:
absorbed by a given quantity of liquid	
at a particular pressure was measured	$\delta T/K = \pm 0.1;  \delta \alpha = \pm 4$ % or less.
by a gas burette. Bodor <i>et al</i> . gave	REFERENCES :
details of a method of calculating gas solubilities, applicable to either apparatus, with allowance for	1. Bodor, E.; Bor, G. J.; Mohai, B.; Sipos, G. Veszpremi. Vegyip. Egy. Kozl. <u>1957</u> , 1, 55.
the vapor pressure of the solvent.	<ol> <li>Schay, G.; Szekely, G.; Racz, Gy.; Traply, G. Periodica Poly- technica Ser. Chem. Eng. (Budapest) 1958, 2, 1.</li> </ol>

COMPONENTS:			<u> </u>	ORIGINAL MEASUR		
			71			
1. Ammo	nia; NH3	; [7664-4]	[-/]	Noda, K.; Mo	orisue, T.; Isł	nida, K.
2. Benz	ene; C <sub>6</sub> H	<sub>6</sub> ; [71-43-	-2]	J. Chem. Eng	g. Japan. <u>1975</u>	<i>8</i> , 104-8.
3. Cyc1	ohevene:	C <sub>6</sub> H <sub>10</sub> ; []	L10-83-81			
	onexency	06107 2-				
VARIABLES:				PREPARED BY:		
P	ressure,	compositi	.on	(	C.L. Young	
EXPERIMENT			Mole frac	tion of §	Mole fractio	on of
т/к	p/atm	p/kPa	ben in liquid	zene in gas,	ammonia in liquid,	
			<sup>x</sup> C <sub>6</sub> H <sub>6</sub>		<sup>x</sup> NH <sub>3</sub>	<sup>y</sup> <sub>NH<sub>3</sub></sub>
			Cene	- Cene	NH 3	- NH 3
202		254	0.083	0.110	0.048	0.978
293.15	2.51 5.53	254 560	0.003	0.086	0.137	0.985
	6.33	641		0.089	0.178	0.989
	7.61	771		0.081	0.278	0.990
1	8.26	837		0.072 0.064	0.522* 0.752*	0.990 0.991
	8.29 8.32	840 843		0.064	0.900*	0.991
]	2.48	251	0.212	0.205	0.050	0.972
	3.07	311		0.198	0.067	0.972
	5.91	599		0.215	0.178	0.989
	6.43	652		0.202	0.209	0.987
	7.68 8.16	778 827	,	0.195 0.155	0.336 0.491	0.991 0.992
	8.10	830		0.147	0.658*	0.990
	8.22	833		0.132	0.801*	0.993
	8.27	838		0.105	0.915*	0.991
	8.30	841	0 500	0.065	0.956	0.992
	1.97	200	0.532	0.492 0.484	0.051 0.100	0.947 0.979
	3.43 4.37	348 443		0.488	0.147	0.980
	5.95	603		0.465	0.244	0.987
	6.99	708		0.458	0.365	0.991
	7.71	781		0.412 0.376	0.572 0.750	0.991 0.992
	7.94	805	<u> </u>	0.370	0.750	0.392
			AUXILIARY	INFORMATION		
METHOD / APP/	ARATUS/PRO	CEDURE:		SOURCE AND PURI	TY OF MATERIALS:	
1					al product, fra	actionated
Fyrex gl	ass cell	Bourdon pi	th gaseous cessure		four times un	
gauge.	Composit	ion of lic	uid phase	pressure		
estimate	d from k	nown volu	ne of		od roadont ar-	
system a sample a	nd amoun nalvsed	ts added. by GC. De	Gas etails		ed reagent sam	
in sourc					al sample, dis raction used.	tilled
					raction used.	
1				ESTIMATED ERROR	l:	
1	~			$\delta T/K = \pm$	0.02; $\delta P/kPa =$	±1;
				$\delta x_{\rm NH_3}, \delta s$	$y_{\rm NH_3} = \pm 0.003.$	
					ed by compiler	)
				REFERENCES:		
			,			
1				]		
]						
ł						
	· · · · · · · · · · · · · · · · · · ·			L		

COMPONENT				ORIGINAL		
1. Ammor	nia; NH <sub>3</sub> ;	[7664-41-]	7]	Noda, K.; Ishida, H	; Morisue, T. K.	;
2. Benze	ene; $C_6H_6$ ;	; [71-43-2]	]			1075 0
3. Cyclo	ohexene; (	C <sub>6</sub> H <sub>10</sub> ; [110	0-83-8]	104-8	Eng. Japan.	<u>1975</u> , 0,
EXPERIMEN	NTAL VALU	ES:	Mole fracti benze		Mole fract ammor	
T/K	p/atm	p/kPa	in liquid	in gas	in liquid	
			<sup>ж</sup> С <sub>6</sub> Н <sub>6</sub>	<sup>ж</sup> с <sub>6</sub> н <sub>6</sub>	y <sub>NH 3</sub>	y <sub>NH 3</sub>
293.15	8.03	814	0.532	0.321		0.992
	8.27 1.50	838 152	0.739	0.238 0.698	0.954 0.040	0.993 0.960
	2.92	296	0.739	0.695	0.040	0.961
	3.55	360		0.707	0.130	0.960
	4.74	480		0.665	0.205	0.984
	6.05 6.79	613 688		0.647 0.640	0.320 0.426	0.989 0.990
	7.05	714		0.635		0.984
	7.12	721		0.646	0.491	0.991
	7.32 7.74	742 784		0.612 0.553		0.993 0.992
	8.00	811		0.487		0.992
	8.05	816		0.445	0.898	0.993
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* tota]	l compositi	ion in two lig	uid phase	region.	
	* total	l compositi	ion in two lig	uid phase	region.	
	* total	l compositi	ion in two lig	uid phase	region.	
	* total	l compositi	ion in two lig	uid phase	region.	
	* total	l compositi	ion in two lig	uid phase	region.	
	* total	l compositi	ion in two lig	uid phase	region.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Gerrard, W.; Maladkar, V.K.
	Chem. Ind. <u>1970</u> , 925-926.
2. Methylbenzene; C <sub>7</sub> H <sub>8</sub> ; [108-88-3]	Maladkar, V.K. Thesis, Univ. of
	London, <u>1970</u> .
VARIABLES:	PREPARED BY:
	P.G.T. Fogg.
EXPERIMENTAL VALUES:	
T/K Moles <sub>NH3</sub> /moles <sub>C7H8</sub> (1 a	atm) Mole fraction <sup>*</sup> $x_{\rm NH_3}$ (l atm)
273.2 0.085	0.078
* Calculated by compiler.	
$1 \text{ atm} = 1.013 \times 10^5 \text{ Pascal}$	
AUXILIARY	INFORMATION -
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Ammonia at barometric pressure was bubbled through a weighed quantity	<ol> <li>Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> </ol>
(about 2 g) of solvent in a glass vessel held in a thermostat until	
saturation was achieved. The	
concentration of ammonia was calcul- ated from the increase in weight of	
the vessel after an allowance had	
been made for the weight of ammonia in the gas phase above the saturated	
solution. Details of the apparatus	
are given in ref. (l).	ESTIMATED ERROR:
	REFERENCES:
	1. Gerrard, W. "Solubility of Gases
	and Liquids", Plenum Press, New York, 1976, p.3.

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COMPONENTS:	ORIGINAL MEASUREMENTS:		
l. Ammonia; NH3; [7664-41-7]	Tremper, K.K.; Prausnitz, J.M.		
2. 1-Methylnaphthalene; C <sub>11H10</sub> ; [1321-94-4]	J. Chem. Engng. Data <u>1976</u> , 21, 295-9		
VARIABLES: Temperature	PREPARED BY: C.L. Young		
EXPERIMENTAL VALUES:			
T/K Henr	y's Constant <sup>a</sup> Mole fraction <sup>b</sup> of /atm ammonia at 1 atm partial pressure <sup>x</sup> NH <sub>3</sub>		
300	30.5 0.0328		
325	49.6 0.0202		
350	68.1 0.0147		
375	86.1 0.0116		
400	104.0 0.00962		
425	0.00826		
450	139.0 0.00719		
475	154.0 0.00649		
a. Authors stated meas and values of solub Law region.	urements were made at several pressures ility used were all within the Henry's		
b. Calculated by compi mole fraction and p	ler assuming linear relationship between ressure.		
	ARY INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
Volumetric apparatus similar to th described by Dymond and Hildebrand (1). Pressure measured with a nul detector and precision gauge. Deta in ref. (2).	Solvent degassed, no other details given.		
	ESTIMATED ERROR: $\delta T/K = \pm 0.1; \ \delta x_{\rm NH_3} = \pm 1$ %. REFERENCES: 1. Dymond, J.; Hildebrand, J.H. Ind.Eng.Chem.Fundam. <u>1967</u> ,6,130. 2. Cukor, P.M.; Prausnitz, J.M. Ind.Eng.Chem.Fundam. <u>1971</u> ,10,638.		

COMPONENTS :	ORIGINAL MEASUREMENTS:		
1. Ammonia; NH3; [7664-41-7]	Delépine,		
2. Methanol; CH <sub>4</sub> O; [67-56-1]	J. Pharm. Chim.		
	1892, 25, 496-7.		
	<u>1071</u> , 207, 150 / 1		
VARIABLES:	PREPARED BY:		
	P. G. T. Fogg		
EXPERIMENTAL VALUES:			
T/K g <sub>NH3</sub> <sup>/dm<sup>3</sup></sup> solution Densit	Ostwald Mole $\star$ y of solution coefficient, fraction $(g \text{ cm}^{-3} L x_{\text{NH}_3} (1 \text{ atm}))$		
273.2 218.0	0.770 425.0 0.426		
* Calculated by compile	er.		
AUXILIA	RY INFORMATION		
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:		
No information given.	No information given. ESTIMATED ERROR:		
	REFERENCES:		

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6 Ammor	hia Solubilities			
COMPONENTS :	ORIGINAL MEASUREME	NTS:		
l. Ammonia; NH <sub>3</sub> ; [7664-41-7]	de Bruyn, L.	de Bruyn, L.		
2. Methanol; CH40; [67-56-1]		Rec. Trav. Chim. Pays-Bas		
	1892, 11, 112-1	-		
	<u>1092</u> , 11, 112-1			
VARIABLES:	PREPARED BY:	PREPARED BY:		
Temperature		P. G. T. Fogg		
EXPERIMENTAL VALUES:				
T/K g <sub>NH3</sub> /	Molaw o/	Mole fraction*		
T/K <sup>9</sup> NH <sub>3</sub> <sup>/</sup> 100 g <sub>solution</sub>	mol <sub>NH<sub>3</sub></sub>	$x_{\rm NH_3}$ (1 atm)		
Solution	NH <sub>3</sub>	NH 3		
273.2 29.3	1.28	0.439		
279.2 26	1.51	0.398		
284.9 23.5 287.9 21.8	1.73 1.91	0.366 0.344		
290.2 20.8	2.02	0.331		
295.2 18.3	2.37	0.297		
301.6 14.8	3.05	0.247		
	<pre>l atm = 1.013 × by compiler.</pre>	10 <sup>5</sup> Pa.		
		10 <sup>5</sup> Pa.		
* Calculated		10 <sup>5</sup> Pa.		
* Calculated	by compiler.	•		
* Calculated	by compiler. NY INFORMATION SOURCE AND PURITY bs ce No info	•		
* Calculated AUXILIA METHOD/APPARATUS/PROCEDURE: Dry ammonia at barometric pressure was introduced into small glass bul (2-3 cm <sup>3</sup> ) of known weight which wer about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by	ARY INFORMATION SOURCE AND PURITY bs ce No info	, OF MATERIALS:		
* Calculated AUXILIA METHOD/APPARATUS/PROCEDURE: Dry ammonia at barometric pressure was introduced into small glass bul (2-3 cm <sup>3</sup> ) of known weight which wer about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by	ARY INFORMATION SOURCE AND PURITY bs ce No info	, OF MATERIALS:		
* Calculated AUXILIA METHOD/APPARATUS/PROCEDURE: Dry ammonia at barometric pressure was introduced into small glass bul (2-3 cm <sup>3</sup> ) of known weight which wer about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by	by compiler.	, OF MATERIALS:		
* Calculated AUXILIA METHOD/APPARATUS/PROCEDURE: Dry ammonia at barometric pressure was introduced into small glass bul (2-3 cm <sup>3</sup> ) of known weight which wer about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by	by compiler.	, OF MATERIALS:		
* Calculated AUXILIA METHOD/APPARATUS/PROCEDURE: Dry ammonia at barometric pressure was introduced into small glass bul (2-3 cm <sup>3</sup> ) of known weight which wer about half full of solvent and held in a thermostat bath. The bulbs were subsequently sealed, reweighed and broken under dilute acid. The ammonia was then estimated by	by compiler.	, OF MATERIALS:		

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COMPONENTS:	ORIGINAL MEASUREMENTS:		
	Hatem, S.		
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]			
2. Methanol; CH40; [67-56-1]	Bull. Soc. Chim. Fr.		
	<u>1949</u> , <i>16</i> , 337-340.		
VARIABLES:	PREPARED BY:		
	P. G. T. Fogg		
	1. 0. 1. 1099		
EXPERIMENTAL VALUES:			
T/K mol <sub>NH3</sub> dm <sup>-3</sup> (solr	A.) Mole fraction*, $x_{\rm NH_3}$		
273.2 13.65	0.449		
283.2 10.85 288.2 9.66	0.375 0.341		
293.2 8.42	0.304		
298.2 7.30 303.2 6.19	0.270 0.234		
308.2 5.34	0.206		
313.2 4.60	0.180		
* The densities of other solutions of ammonia in methanol of various concentrations at temperatures from 273.2 K to 303.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.			
AUXILIARY	INFORMATION ~		
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:		
Ammonia from a cylinder was bubbled, for about one hour in each case, through portions of methanol in a graduated glass absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a pyknometer.	<ol> <li>Obtained from a cylinder; passed over CaO.</li> <li>Free from traces of H<sub>2</sub>O and (CH<sub>3</sub>)<sub>2</sub>CO; b.p. 65 °C; density (15 °C) 0.794 g cm<sup>-3</sup>; n<sub>D</sub> (temp. not stated) 1.330.</li> <li>ESTIMATED ERROR:</li> </ol>		
1			
	DEPENDING .		
	REFERENCES:		

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COMPONENTS:		ORIGINAL	. MEASUREMENTS:	
<ol> <li>Ammonia; NH<sub>3</sub>; [766</li> <li>Aliphatic monohydric</li> </ol>		Gogol Zh. F	tsov, A. I.; Panch eva, T. V. <i>iz. Khim. <u>1968</u>, 42, J. Phys. Chem. <u>196</u> 1).</i>	982-3
VARIABLES:		PREPAREI	р ВҮ: Р. G. T. Fog	ıa
EXPERIMENTAL VALUES:	<u> </u>	·····		_
Solvent	т/к р	NH <sub>3</sub> /mmHg	Mole ratio <sup>mol</sup> NH3/ <sup>mol</sup> solv.	Mole fraction* <sup>x</sup> NH <sub>3</sub>
Methanol; CH4O; [67-56-1]	291.2	760	0.54	0.35
Ethanol; C <sub>2</sub> H <sub>6</sub> O; [64-17-5]	291.2	760	0.49	0.33
l-Propanol; C <sub>3</sub> H <sub>8</sub> O; [71-23-8]	291.2	760	0.34	0.25
2-Propanol; C <sub>3</sub> H <sub>8</sub> O; [67-63-0]	291.2	760	0.34	0.25
<pre>mol<sub>NH3</sub>/mol<sub>solvent</sub> = p<sub>NH3</sub> × constant was "satisfactorily" obeyed except by methanol close to atmospheric pressure. *Calculated by the compiler. 760 mmHg = 1 atm = 1.013 × 10<sup>5</sup> Pa.</pre>				
	AUXILIA	RY INFORMAT	ION	
METHOD /APPARATUS / PROCEDURE :		SOURCE	AND PURITY OF MATERIALS	5:
Conventional gas handli attached to a vacuum li A measured volume of so admitted to the absorpt which was fitted with a stirrer. Portions of measured volume and pre admitted to the absorpt and equilibrium pressur vessel were measured by manometer. Allowance the vapor pressure of t but the method of makin allowance was not state	Ine was used olvent was ion vessel a magnetic ammonia at a essure were ion vessel res in this a mercury was made for the solvent ag this	<ul> <li>1. Obt</li> <li>cy:</li> <li>2. Met</li> <li>gra</li> <li>a "cl</li> <li>ESTIMAT</li> <li>δT/K =</li> <li>(estin</li> </ul>	tained from a commendation linder. thanol: "analytical ade; ethanol: 92% punemically pure" gra ED ERROR: = $\pm 0.5$ ; $\delta p/mmHg$ = mated by authors). CES:	reagent" re; propanol: de.

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COMPONENT	S:	ORIC	GINAL MEASUREMENTS:	
1. Amm	onia; NH <sub>3</sub> ; [7664-41-7]	De	elépine,	
}	anol; $C_2H_6O$ ; [64-17-5]	J.	Pharm. Chim.	
			392, 25, 496-7.	
VARIABLES	:	PREI	PARED BY:	
	Temperature	[		T. Fogg
}	Temperature			
EXPERIMEN	TAL VALUES:		····	*****
Т/К	g <sub>NH3</sub> /dm <sup>3</sup> solution /	of sol	Ostwald ution coefficier	nt, fraction
	,	y cm	D	$x_{\mathrm{NH}_3}$ (l atm)
273.2	130.5 0	.782	209.5	0.351
283.2			164.3	
293.2		.791	106.6	0.221
303.2	51.5 0	.798	97.0	0.157
* Calculated by compiler.				
	AUXILI	ARY INFO	RMATION -	
METHOD /AP	PARATUS/PROCEDURE:	SOUF	RCE AND PURITY OF MA	ATERIALS:
			No informatio	n given.
}				-
r	No information given.			
	-			
		ĺ		
		EST	MATED ERROR:	
		REFI	ERENCES :	
1				
L				

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COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	de Bruyn, L.	
2. Ethanol; C <sub>2</sub> H <sub>6</sub> O; [64-17-5]	Rec. Trav. Chim. Pays-Bas	
	1892, 11, 112-191.	
VARIABLES:	PREPARED BY:	
Temperature	P. G. T. Fogg	
EXPERIMENTAL VALUES:		
EXPERIMENTAL VALUES;		
a (	Mol	
$T/K = \frac{g_{\rm NH_3}}{100 \ g}$	$rac{Mol_{C_2H_6O}}{mol_{NH_3}}$ Mole fraction* $x_{NH_3}$ (l atm)	
100 g <sub>solution</sub>	NH <sub>3</sub> NH <sub>3</sub> (1 dom)	
273.2 19.7 279.2 17.1	1.51 0.398 1.79 0.358	
284.9 14.1	2.25 0.308	
287.9 13.2	2.43 0.292 2.56 0.281	
290.2 12.6 295.2 10.9	3.02 0.281	
301.6 9.2	3.73 0.211	
* Calculated by compiler.		
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
Dry ammonia at barometric pressure		
was introduced into small glass		
bulbs $(2-3 \text{ cm}^3)$ of known weight		
which were about half full of	No information given.	
solvent and held in a thermostat		
bath. The bulbs were subse-		
quently sealed, reweighed and		
broken under dilute acid.	ESTIMATED ERROR:	
The ammonia was then estimated		
by titration.		
	REFERENCES:	
	1	

COMPONENTS :		ORIGINAL MEASUREMENT	rs •
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]		Barclay, I.M.; Butler, J.A.V.	
2. Ethanol; $C_2H_6O$ ; [64-17-5]		Trans. Faraday Soc. <u>1938</u> ,34, 1445-54.	
VARIABLES:		PREPARED BY:	
Pres	sure, temperature	P.G	.T. Fogg.
EXPERIMENTAL VAL	UES:	1	
T/K	Mole fraction in solution, $x_{ m NH_3}$	Wt % NH in condensate	p <sub>NH3</sub> /mmHg *
298.2	4.053 x 10-3	4.482	7.47
298.2	3.983 x 10-3	4.40	7.33
308.2	3.94 x 10 <sup>-3</sup>	3.59	10.42
308.2	3.896 x 10 <sup>-3</sup>	3.59	10.42
	AUXILIARY	INFORMATION -	
METHOD, APPARATUS	/PROCEDURE:	SOURCE AND PURITY OF	F MATERIALS:
six bulbs cor known concent vapor which e a tube cooled was absorbed containing so titration. T ia to ethanol was equal to phase. It wa partial press solution coul the concentra Raoult's law was dilute. of ammonia ou taken to be e the mole rati in the vapor	assed through a row of ntaining solution of cration. The ethanol emerged was trapped in d by solid CO <sub>2</sub> . Ammonia in a second tube olvent and estimated by the mole ratio of ammon- l in the total condensate the ratio in the vapor assumed that the sure of ethanol over the d be calculated from ation by use of because the solution The partial pressure ver the solution was equal to the product of co of ammonia to ethanol phase and the partial ethanol in the vapor	(760 mmHg).	dried; b.p. 78.47°C

COMPONENTS:	ORIGINAL MEASUREMENTS:
l. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Hatem, S.
2. Ethanol; $C_{2}H_{6}O$ ; [64-17-5]	Bull. Soc. Chim. Fr.
	1949, 16, 337-340.
	<u>1545</u> , 10, 557 540.
VARIABLES:	PREPARED BY:
Temperature	P. G. T. Fogg
EXPERIMENTAL VALUES:	
T/K mol <sub>NH3</sub> dm <sup>-3</sup> (soln	.) Mole fraction*, $x_{\rm NH_3}$
273.2 8.65	0.308
283.2 6.62 288.2 5.69	0.246 0.215
293.2 5.02	0.192
298.2     4.32       303.2     3.79	0.167 0.148
308.2 3.30	0.130
concentrations at temperatures f by the authoress. The compiler solutions listed above by extrap	
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Ammonia from a cylinder was bubbled,	1. Obtained from a cylinder;
for about an hour in each case, through portions of ethanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a pyknometer.	<pre>passed over CaO. 2. Absolute alcohol: distilled from CaO; b.p. 78.35 °C; n<sub>D</sub><sup>20</sup> 1.3614; density (20 °C) 0.7901 g cm<sup>-3</sup>.</pre>
	ESTIMATED ERROR:
	REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Hatem, S.
2. 1-Propanol; C <sub>3</sub> H <sub>8</sub> O; [71-23-8]	Bull. Soc. Chim. Fr.
	<u>1949</u> , <i>16</i> , 337-340.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	L
T/K mol <sub>NH3</sub> dm <sup>-3</sup> (soln	.) Mole fraction*, $x_{\rm NH_3}$
273.2 7.07	0.388
283.2     5.3       288.2     4.65	0.314 0.284
288.2 4.65 293.2 4.15	0.259
298.2 3.62	0.232
303.2 3.25	0.213
308.2 2.39	0.163
concentrations at temperatures fr the authoress. The compiler has tions listed above by extrapolati	of ammonia in 1-propanol of various om 273.2 K to 308.2 K were given by estimated the densities of solu- on and has then calculated mole concentrations given in the paper.
AUXILIARY	INFORMATION -
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
	1. Obtained from a cylinder;
Ammonia from a cylinder was bubbled, for about an hour in each case,	passed over CaO.
through portions of propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and tiration with sulfuric acid. Densities of solutions were measured with a pyknometer.	2. Distilled twice; b.p. 94.4 °C; density (20 °C) 0.8038 g cm <sup>-3</sup> .
	ESTIMATED ERROR:
	REFERENCES:

1. Ammonia; NH.;; [7664-41-7]       Hatem, S.         2. 2-Propanol; C,H <sub>8</sub> O; [67-63-0]       Bull. Soc. Chim. Fr.         1949, 18, 337-340.         VARIABLES:       PREPARED BY:         T/K       mol <sub>NH,</sub> dm <sup>-3</sup> (soln.)         Mole fraction*       "Nh <sub>3</sub> 273.2       6         283.2       4.05         293.2       3.48         293.2       2.52         206.2       2.52         0.157       (unspecified).         * The densities of other solutions of ammonia in 2-propanol         of various condentrations at temperatures from 373.2 K to         308.2       2.25         0.157         * The densities of other solutions of ammonia in 2-propanol         of various condentrations at temperatures from 373.2 K to         308.2       2.25         0.157         * The densities of solutions of anmonia in 2-propanol         of various condentrations at temperatures from 373.2 K to         308.2 K were given by the authoress.         extmated the donsities of solution and has then calculated mole fraction         solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/FROCEDURE:         Ammonia from a cylinder was bubbled, in	COMPONENTS:	ORIGINAL MEASUREMENTS	:
2. 2-Propanol; C <sub>3</sub> H <sub>2</sub> O; (67-63-0) <u>1949</u> , 16, 337-340. <u>VARIABLES:</u> <u>Temperature</u> <u>EXPERIMENTAL VALUES:</u> <u>T/K</u> <u>T/K</u> <u>mol<sub>NH3</sub></u> dm <sup>-3</sup> (soln.) Mole fraction* <u>NH3</u> <u>273.2</u> <u>6</u> <u>0.349</u> <u>The total</u> <u>283.2</u> <u>4.55</u> <u>0.263</u> <u>pressure</u> <u>284.2</u> <u>2.98</u> <u>0.200</u> <u>pressure</u> <u>303.2</u> <u>2.52</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>108.2</u> <u>2.255</u> <u>0.157</u> <u>10.157</u> <u>2.255</u> <u>0.157</u> <u>10.157</u> <u>2.255</u> <u>0.157</u> <u>10.157</u> <u>2.255</u> <u>2.255</u> <u>0.157</u> <u>2.255</u> <u>0.157</u> <u>10.157</u> <u>2.255</u> <u>1.570</u> <u>2.525</u> <u>1.570</u> <u>2.525</u> <u>1.570</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>1.570</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.157</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u>2.525</u> <u></u>	1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Hatem, S.	
Importation         VARIABLES:         Temperature         Type	2 2-Bronzpol, C.H.O. [67-63-0]	Bull. Soc. Chim. Fr.	
VARIABLES:       PREFARED BY:         Temperature       F. G. T. Fogg         EXPERIMENTAL VALUES:       F. G. T. Fogg         T/K       mol <sub>NH,</sub> dm <sup>-3</sup> (soln.)       Mole fraction*	$2.2-\text{Propanor}, C_{3}R_{8}O; [07-03-0]$	1949. 16. 337-34	10.
Temperature       P. G. T. Fogg         EXPERIMENTAL VALUES:       mol <sub>NH3</sub> dm <sup>-3</sup> (soln.) Mole fraction*		<u> </u>	
EXPERIMENTAL VALUES:         T/K       mol <sub>NH3</sub> dm <sup>-3</sup> (soln.)       Mole fraction*	VARIABLES:	PREPARED BY:	
T/K       mol <sub>NH3</sub> dm <sup>-3</sup> (soln.)       Mole fraction*         273.2       6       0.349       The total         288.2       4.05       0.283       pressure         288.2       4.05       0.228       barometric         293.2       3.48       0.228       barometric         293.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157       0         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:	Temperature	Р.	G. T. Fogg
T/K       mol <sub>NH3</sub> dm <sup>-3</sup> (soln.)       Mole fraction*         273.2       6       0.349       The total         288.2       4.05       0.283       pressure         288.2       4.05       0.228       barometric         293.2       3.48       0.228       barometric         293.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157       0         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:			
* NH;         273.2       6       0.349       The total         288.2       4.05       0.283       pressure         293.2       3.48       0.228       barometric         293.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157         * The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILLARY INFORMATION         Method (not in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:	EXPERIMENTAL VALUES:		
* NH;         273.2       6       0.349       The total         288.2       4.05       0.283       pressure         293.2       3.48       0.228       barometric         293.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157         * The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILLARY INFORMATION         Method (not in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:	$mol dm^{-3}$ (col m)	Molo fraction*	
273.2       6       0.349       The total         283.2       4.05       0.283       pressure         288.2       4.05       0.228       barometric         293.2       1.48       0.228       barometric         293.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 306.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction sclubilities from molar concentrations given in the paper.         AUXILLARY INFORMATION         METHOD/APPARATUS/PROCEDURE:       SOURCE AND PURITY OF MATERIALS:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:	T/K NH <sub>3</sub> diff (SOIII.)	<sup>x</sup> NH <sub>2</sub>	
283.2       4.55       0.283       pressure         288.2       4.05       0.258       was equal to         293.2       3.48       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         SOURCE AND PURITY OF MATERIALS:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a			
288.2       4.05       0.258       was equal to         298.2       3.48       0.228       barometric         298.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILLARY INFORMATION         METHOD/APPARATUS/PROCEDURE:       SOURCE AND PURITY OF MATERIALS:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:			
293.2       3.48       0.228       barometric         298.2       2.98       0.200       pressure         303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157       (unspecified).         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION       METHOD/APPARATUS/PROCEDURE:       SOURCE AND PURITY OF MATERIALS:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to t0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:			÷ 1
303.2       2.52       0.173       (unspecified).         308.2       2.25       0.157       (unspecified).         *       The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       SOURCE AND PURITY OF MATERIALS:         ESTIMATED ERROR:       Unition were measured with a			
308.2       2.25       0.157         * The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD /APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD /APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD /APPARATUS/PROCEDURE:         Autom a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to to 10.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       ESTIMATED ERROR:		-	
* The densities of other solutions of ammonia in 2-propanol of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: Anumonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to t0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a			(unspecified).
of various concentrations at temperatures from 273.2 K to 308.2 K were given by the authoress. The compiler has estimated the densities of solutions listed above by extrapolation and has then calculated mole fraction solubilities from molar concentrations given in the paper.         AUXILIARY INFORMATION         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Auxiliary INFORMATION         METHOD/APPARATUS/PROCEDURE:         Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a       SOURCE AND PURITY OF MATERIALS:         ESTIMATED ERROR:	500.2 2.25		
<ul> <li>METHOD/APPARATUS/PROCEDURE:</li> <li>Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to ±0.1 K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a</li> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>I. From a cylinder; passed over CaO.</li> <li>2. b.p. 82.7 °C; n<sub>D</sub><sup>17</sup> 1.380; density (17 °C) 0.790 g cm<sup>-3</sup></li> </ul>	solubilities from molar concentrat	ions given in the	paper.
Ammonia from a cylinder was bubbled, for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to $\pm 0.1$ K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a	AUXILIARY	INFORMATION	
for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to $\pm 0.1$ K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a	METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF	MATERIALS:
	for about an hour in each case, through portions of 2-propanol in a graduated absorption vessel held in a thermostat controlled to $\pm 0.1$ K. The final volumes of solution were recorded. Dissolved ammonia was estimated by dilution with water and titration with sulfuric acid. Densities of solutions were measured with a	CaO. 2. b.p. 82.7 °C; density (17 °	n <sub>D</sub> <sup>17</sup> 1.380;

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		Lonzoru			
COMPONENTS:			L MEASUREMENTS:		
1. Ammonia; NH <sub>3</sub> ; [7664	4-41-7]		Kuznetsov, A. I.; Panchenkov, G. M.;		
2. Aliphatic monohydric alcohols		-	eva, T. V. Jiz. Khim. <u>1968</u> , 42,	000.0	
		L C	J. Phys. Chem. 196		
		510-1		<u>, 1</u> , 12,	
VARIABLES:		PREPARE		<del></del>	
1			P. G. T. Fog		
			r. G. I. FO <u>C</u>	19	
EXPERIMENTAL VALUES:		1			
Solvent	т/к р <sub>NH</sub>	/mmHg	Mole ratio mol <sub>NH3</sub> /mol <sub>solv</sub> .	Mole fraction* <sup>x</sup> NH3	
1-Butanol; C4H100; [71-36-3]	291.2	760	0.36	0.26	
2-Methyl-1-propanol; C <sub>4</sub> H <sub>10</sub> O; [78-83-1]	291.2	760	0.38	0.28	
3-Methyl-l-butanol (isopentyl alcohol); C <sub>5</sub> H <sub>12</sub> O; [123-51-3]	288.2	760	0.38	0.28	
The authors also stated that Henry's law in the form: $mol_{NH_3}/mol_{solvent} = p_{NH_3} \times constant$ was "satisfactorily" obeyed. * Calculated by the compiler. 760 mmHg = 1 atm = 1.013 × 10 <sup>5</sup> Pa.					
	AUXILIARY	INFORMA	rion		
METHOD 'APPARATUS / PROCEDURE :		SOURCE	AND PURITY OF MATERIALS	:	
Conventional gas handlin	g apparatus				
attached to a vacuum lin		1. Ob	tained from a comme	rcial	
A measured volume of sol	vent was	су	linder.		
admitted to the absorpti	on vessel		tanol: "chemically		
which was fitted with a			methyl-l-propanol:	-	
stirrer. Portions of a			agent" grade; 3-met	hy1-1-butanol:	
measured volume and pres admitted to the absorption		p p	re grade".		
and equilibrium pressure		LSTIMAT	ED ERROR:		
vessel were measured by		δ <b>T/K</b> :	= $\pm 0.5$ ; $\delta p/mmHg =$	±0.5	
manometer. Allowance w		(estin	nated by authors).		
the vapor pressure of the		REFEREN	CFS		
but the method of making	this	ALFEREN	с <i>и</i> д ,		
allowance was not stated	•				

\*

COMPONENTS:	ORIGINAL MEASUREMENTS:			
<ol> <li>Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>Butanols, C<sub>4</sub>H<sub>10</sub>O;</li> </ol>	Maladkar, V.K. Thesis, Univ. of London, <u>1970</u>			
2. Bulanois, Clargo,	(See also Gerrard, W.; Maladkar, V.K. <i>Chem. Ind.</i> <u>1970</u> , 925-926).			
VARIABLES:	PREPARED BY:			
	P.G.T. Fogg			
EXPERIMENTAL VALUES:				
Compound T/K	Moles <sub>NH3</sub> /moles <sub>solvent</sub> (1 atm)	Mole fraction * <sup>°°</sup> NH <sub>3</sub> (1 atm)		
l-butanol; [71-36-3] 273.2	0.5813	0.368		
2-butanol [78-92-2] 273.2	0.4510	0.311		
2-methyl-2-propanol; [75-65-0] 273.2	0.3590	0.264		
2-methyl-l-propanol; [78-83-1] 273.2	0.6000	0.375		
* Calculated by compil	er			
$1 \text{ atm} = 1.013 \times 10^5$	Pa			
AUXILIARY	INFORMATION			
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATER	IALS;		
Ammonia at barometric pressure was bubbled through a weighed quantity	1. Obtained from a cy by KOH pellets and			
(about 1 g) of solvent in a glass vessel held in a thermostat until saturation was achieved. The	2. 1-&2- butanols: di digested over BaO; Na.			
concentration of ammonia was calculated from the increase in weight of the vessel after an allow-				
ance had been made for the weight of ammonia in the gas phase above the saturated solution. Details of	2-methyl-l-propano BaO; distilled.	1: dried over		
the apparatus are given in ref. (1).	ESTIMATED ERROR:			
	REFERENCES:			
	<ol> <li>Gerrard, W.; "Soli Gases and Liquids Press, New York,</li> </ol>	", Plenum		

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ORIGINAL MEASUREMENTS:		
Short, I.; Sahgal, A.; Hayduk, W. J. Chem. Eng. Data <u>1983</u> ,		
PREPARED BY: W. Hayduk		
	Mole Fraction <sup>1</sup>	
221.2 66.9 26.2	0.472 (0.4721) <sup>3</sup> 0.217 (0.2170) 0.1007(0.1007)	
$\begin{array}{rcl} & \ln x_{1} & \text{and table of} \\ & \Gamma & \Pi & T & - & 6177.75 & T & + \\ & 12.455 & \ln & T & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ $	smoothed values: 143147	
INFORMATION		
minimum purity 2. Canlab. Spec: purity 99.0 perity ESTIMATED ERROR: $\delta T/K = 0.1$ $\delta r / r = 0.01$	ic. Specified y 99.99 per cent. ified minimum er cent. Battino, R.; Gross, P.M.	
	Short, I.; Sahgal J. Chem. Eng. Dat PREPARED BY: W. Hayduk PREPARED DY: W. Hayduk 221.2 66.9 26.2 e original data was a ln $x_1$ and table of T ln $T - 6177.75 T + 12.455 ln T$ T/K 10 <sup>-4</sup> AG°/J mo 03.15 4.075 3.15 4.776 23.15 5.510 INFORMATION INFORMATION SOURCE AND PURITY OF MA 1. Liquid Carbon: minimum purit; 2. Canlab. Spec: purity 99.0 po ESTIMATED ERROR: $\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$ REFERENCES: 1. Clever, H.L.; Saylor, J.H.: J. Phys. Chem.	

COMPONENTS:	ORIGINAL MEASUREMENTS:			
<ol> <li>Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>Octanol; C<sub>8</sub>H<sub>18</sub>O; [111-87-5]</li> </ol>	Gerrard, W.; Maladkar, V.K. <i>Chem. Ind.</i> <u>1970</u> , 925-926. Maladkar, V.K. Thesis, Univ. of London, 1970.			
VARIABLES: Temperature, pressure	PREPARED BY: P.G.T. Fogg.			
EXPERIMENTAL VALUES:				
T/K Moles NH3 /moles C8H18C	(1 atm) Mole fraction* $x_{ m NH_3}$ (1 atm)			
273.2 0.56	0.359			
The variation of moles $_{\rm NH_3}$ /moles $_{C_8H_{18}O}$ ( $p_{\rm NH_3}$ = 1 atm) with temperature from 263 K to 293 K was given in graphical form. The variation of moles $_{\rm NH_3}$ /moles $_{C_8H_{18}O}$ (T = 273.2 K) with pressure from 0 to 1 atm was also given in the form of a graph. * Calculated by compiler.				
AUXILIARY	INFORMATION			
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:			
Absorption at barometric pressure was measured by bubbling ammonia through a weighed quantity (about 2 g) of octanol in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution.	<ol> <li>Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>Dried over CaCl<sub>2</sub>; distilled under reduced pressure.</li> </ol>			
Solubilities at low pressures were calculated from weight changes when solutions which had been previously saturated at barometric pressure were allowed to come to equilibrium under a lower pressure of ammonia. Details of the apparatus are given	ESTIMATED ERROR:			
in ref. (1).	1. Gerrard, W. "Solubility of Gases and Liquids," Plenum Press, New York, <u>1976</u> , p.3.			

COMPONENTS :		ORIGINAL MEASUREMENTS:	
1. Ammonia;	NH <sub>3</sub> ; [7664-41-7]	Cauquil, G.	
2. Cyclohex	$C_6H_{12}O;$	J. Chim. Phys. Phys. Chim. Biol.	
[108-93-	•0]	<u>1927,</u> 24, 53-55.	
VARIABLES:		PREPARED BY:	
		P. G. T. Fogg	
EXPERIMENTAL VAL	UES:	L	
		Mole fraction*	
т/к	$p_{H_3N}$ /mmHg Ost	wald coefficient $x_{\rm NH_2}$ (1 atm)	
		L	
299.2	755	28.166 0.108	
		_	
	760  mmHg = 1  atm = 1.013	3 × 10° Pa.	
* Value of a	$x_{_{\rm NH_{\circ}}}$ (1 atm) has been cal	culated by the compiler using	
		K and 303.2 K given in refs.	
(1) and (2	2), respectively, and val	ues of van der Waals constants	
	ia given in ref. (1).		
	-		
	AUXILIARY	INFORMATION ·-	
METHOD/APPARATUS	/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
A measured t	volume of cyclohexanol	2. Dissolved air removed by boiling	
	o contact with a	b.p. 334.1 K (766 mmHg).	
-	lume of ammonia in a	D.p. 334.1 K (700 Maily).	
-			
	e of gas and the		
-	and pressure were		
	en equilibrium had been		
	eached. The author considered		
	owance for the vapor		
	cyclohexanol at the		
temperature	of measurement was		
necessary.		REFERENCES:	
		<ol> <li>Handbook of Chemistry and Physics (61st edition) C.R.C. Press, Cleveland, Ohio, 1980.</li> </ol>	
		2. Timmermans, J. Physico-Chemical	
		Constants of Pure Organic Com- pounds, Vol. II, Elsevier, London, <u>1965</u> .	

COMPONENTS :	ORIGINAL MEASUREMENTS:				
(1) Ammonia; NH <sub>3</sub> ; [7664-41-7]	Short, I.; Sahgal, A.; Hayduk, W.				
(2) 1,2-Ethanediol (ethylene glyco)	1); J. Chem. Eng. Data <u>1983</u> ,				
C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]					
202					
VARIABLES:	PREPARED BY:				
T/K: 263.15-333.15	W. Hayduk				
<i>P/</i> kPa: 101.325					
EXPERIMENTAL VALUES:					
	Bunsen Coefficient <sup>2</sup> Mole Fraction <sup>1</sup> /cm <sup>3</sup> (STP) cm <sup>-3</sup> atm <sup>-1</sup> $x_1$				
263.15 727	754.6 0.652 (0.652) <sup>3</sup>				
298.15 296.2 333.15 120.3	271.4 0.406 (0.406) 98.6 0.202 (0.202)				
<sup>1</sup> Original data					
<sup>2</sup> Calculated by compiler	he emigrical data use used to determine				
the following equations for $\Delta G^{\circ}$ and	he original data was used to determine nd ln $x_{\tau}$ and table of smoothed values:				
$\Delta G^{\circ}/J \text{ mol}^{-1} = -RT \ln x_1 = 2150.43$					
$\ln x_1 = 169.459 - 6274.08/2$	T - 26.2071 ln T				
$\frac{T/K}{2} \qquad \frac{10^{-4} \Delta G^{\circ}/J \text{ mol}^{-1}}{2} \qquad \frac{x_1}{2} \qquad \frac{x_2}{2} \qquad \frac{x_2}{2} \qquad \frac{x_2}{2} \qquad \frac{x_3}{2} \qquad \frac{x_4}{2} \qquad \frac$	$T/K$ 10 <sup>-4</sup> $\Delta G^{\circ}/J$ mol <sup>-1</sup> $x_1$				
263.15 0.924 0.6520	303.15 2.463 0.3715				
273.15 1.193 0.5872 283.15 1.541 0.5151	313.15         3.032         0.3073           323.15         3.669         0.2507				
293.15         1.966         0.4417         3           298.15         2.205         0.4060	333.15 4.373 0.2020				
250.15 2.205 0.4000					
AUXILIA	ARY INFORMATION				
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:				
A volumetric method using a glass apparatus was employed. Degassed					
solvent contacted the gas while flowing as a thin film, at a	2. Canlab. Baker Analyzed grade				
constant rate, through an absorpt: spiral into a solution buret. A					
constant solvent flow was obtained	-				
by means of a calibrated syringe pump. The solution at the end of					
the spiral was considered saturate Dry gas was maintained at atmosphe					
ric pressure in a gas buret by	ESTIMATED ERROR:				
mechanically raising the mercury level in the buret at an adjustable	$\delta T/K = 0.1$				
rate. The solubility was calculated from the constant slope of volume					
of gas dissolved and volume of	REFERENCES:				
solvent injected.	1. Clever, H.L.; Battino, R.;				
Degassing was accomplished using a two stage vacuum process described					
by Clever et al. (1).	J. Phys. Chem. <u>1957</u> , 61, 1078.				
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		Ammonia				c
				. MEASUREMENT		
<pre>1. Armonia; NH<sub>3</sub>; [7664-41-7] 2. 2,2'-Oxybisethanol (diethylene glycol); C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>; [111-46-6]</pre>		Timonin, V. E.; Timofeeva, E. G.; Marchenkova, T. G.; Marchenkov, V. F. <u>1980</u> , VINITI deposited document 2874-80.				
VARIABLES:			PREPAREI	D BY:		······································
Ten	perature, pre	essure		P. (	G. T. Fogg	
EXPERIMENTAL VAL	UES:					
T/K p <sub>NH3</sub> /at	Bunsen m coeff. α	Mole fraction# <sup>x</sup> NH <sub>3</sub>	т/к	p <sub>NH3</sub> /atm	Bunsen coeff. α	Mole fraction# <sup>x</sup> NH <sub>3</sub>
densities o	13.8	0.021 0.055 0.103 0.222 0.285 0.306 0.336 0.368 0.623 0.756 0.776 0.827 0.831 0.867 0.888 0.893 er using en in ref.	313.2	0.14 0.29 0.43 0.54 0.63 0.71 0.83 0.90 2.76 3.64 4.00 5.92 6.84 8.72 9.40 9.60 9.88 11.8 13.3 15.0	18.9 33.5 45.4 54.8 61.1 69.4 78.1 83.6 256 323 329 498 540 727 742 916 932 1291 1755 2525 (cor	0.075 0.125 0.162 0.190 0.207 0.229 0.250 0.263 0.522 0.580 0.584 0.680 0.697 0.756 0.796 0.796 0.799 0.846 0.882 0.915
		AUXILIARY	INFORMAT	10N		
METHOD APPARATUS	/PROCEDURE :		SOURCE A	ND PURITY OF	MATERIALS	
METHOD APPARATUS / PROCEDURE: Apparatus described previously was used (ref. 2). A quantity of gas, measured by changes in pressure of a known volume, was allowed into contact with solvent in a thermo- statted absorption vessel. The liquid was magnetically stirred and the final pressure of gas in contact with solvent was measured.		1. Dri rer 2. Ana lic unc	ied with si	lica gel; peated cor pure; coo gen and dec	ndensation.	
			Con pou Ams 2. Bra Ded	CES: mermans, J stants of unds, Vol. sterdam, <u>19</u> uude, G. E. dova, I. V. <i>m. Prom.</i> <u>1</u>	Pure Organ II, Elsevi 65. ; Leites,	<i>eic Com-</i> .er,

<pre>COMPONENTS: 1. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. 2,2'-Oxybisethanol (diethylene glycol); C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>; [111-46-6]</pre>		(	ORIGINAL MEASUREMENTS:				
		Timonin, V. E.; Timofeeva, E. G.; Marchenkova, T. G.; Marchenkov, V. F. <u>1980</u> , VINITI deposited document 2874-80.					
EXPERI	MENTAL VALU	JES:		<u></u>			
т/к	p <sub>NH3</sub> /atm	Bunsen coeff. a	Mole fraction# <sup>x</sup> NH <sub>3</sub>	т/к	p <sub>NH3</sub> /atm	Bunsen coeff. a	Mole fraction <sup>x</sup> NH <sub>3</sub>
328.2	0.25 0.44 0.59 0.70 0.77 0.84 0.90 5.00 5.04 8.44 8.72 9.56 10.1 10.2 17.1 19.8 21.7	16.8 28.4 37.7 44.2 50.0 62.8 57.6 251 264 458 460 522 575 589 1212 2032 2844	0.0673 0.109 0.139 0.159 0.177 0.212 0.198 0.519 0.531 0.663 0.664 0.691 0.712 0.717 0.839 0.897 0.924	343.2	0.28 0.49 0.66 0.75 0.83 0.91 7.40 14.4 15.1 24.1 25.8 28.2 29.6 32.3	13.1 22.4 28.4 33.5 36.6 38.7 40.0 256 404 541 1232 1428 2044 2269 2950	0.054 0.088 0.109 0.126 0.136 0.143 0.147 0.525 0.635 0.700 0.842 0.860 0.898 0.907 0.927

<sup>#</sup> Calculated by the compiler using densities of solvent given in ref. 1.

 $1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$ 

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Ammon	a Solubilities 5			
COMPONENTS:	ORIGINAL MEASUREMENTS:			
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. 1,2,3-Propanetriol (glycerol); C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>; [56-81-5] 2-Propanone (acetone); C<sub>3</sub>H<sub>6</sub>O; [67-64-1] VARIABLES:</pre>	Kuznetsov, A. I.; Panchenkov, G.M. Gogoleva, T. V. Zh. Fiz. Khim. <u>1968</u> , 42, 982-3. (Russ. J. Phys. Chem. <u>1968</u> , 42, <u>510-11)</u> PREPARED BY: P. G. T. Fogg			
EXPERIMENTAL VALUES:				
Solvent T/K p <sub>NH3</sub> /m	mHg mol <sub>NH3</sub> /mol <sub>solvent</sub> Mole fraction <sup>*</sup> $x_{NH_3}$			
1,2,3-Propanetriol 291.2 760 2-Propanone 292.2 760				
<pre>mol<sub>NH3</sub>/mol<sub>solvent</sub> was "satisfactorily" obeyed except pressure. 760 mmHg = 1 * Calculated by the</pre>	by glycerol close to atmospheric atm = 1.013 × 10 <sup>5</sup> Pa.			
AUXILIAR	INFORMATION			
IETHOD /APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:			
Conventional gas handling apparatus attached to a vacuum line was used. A measured volume of solvent was admitted to the absorption vessel which was fitted with a magnetic stirrer. Portions of ammonia at a measured volume and pressure were then admitted to the absorption vessel and equilibrium pressures in this vessel were measured by a mercury manometer. Allowance was made for the vapor pressure of the solvent but the method of making this allowance was not stated.	<pre>1. Obtained from a commercial cylinder. 2. Acetone was of "analytical re- agent" grade; 1,2,3-Propanetriol was of "pure" grade. ESTIMATED ERROR: δT/K = ±0.5; δp/mmHg = ±0.5 (estimated by the authors). REFERENCES:</pre>			

COMPONENTS:	ORIGINAL MEASUREMENTS:		
l. Ammonia, NH <sub>3</sub> ; [7664-41-7]	Gerrard, W.; Maladkar, V.K.		
2. Chloroethanols	Chem. Ind. <u>1970</u> , 925-926.		
VARIABLES:	PREPARED BY:		
	P.G.T. Fogg.		
EXPERIMENTAL VALUES:			
Compound Mole	$es_{\rm NH_3}/moles_{ m solvent}$ Mole fraction * (1 atm) $x_{\rm NH_3}$ (1 atm)		
2-Chloroethanol C <sub>2</sub> H <sub>5</sub> Cl0; [59826-67-4]	1.03 0.507		
2,2-Dichloroethanol C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> O; [598-38-9]	1.31 0.567		
2,2,2-Trichloroethanol C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> O; [115-20-8]	1.33 0.571		
All measurements were made at T = 273.2 K In the case of 2,2,2-trichloroethanol the variation of $moles_{NH_3}/moles_{C_2H_3Cl_3O}$ (T = 273.2 K) with pressure from 0 - 1 atm was given in the form of a graph.			
* Calculated by compiler. 1 atm = 1.013 x 10 <sup>5</sup> Pa			
AUX	ILIARY INFORMATION		
METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
Ammonia at barometric pressure w bubbled through a weighed quanti (about 2 g) of solvent in a glas vessel held in a thermostat unti saturation was achieved. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas pha above the saturated solution.	Ase		
Details of the apparatus are giv in ref. (1).	ESTIMATED ERROR:		
	<pre>REFERENCES: 1. Gerrard, W. "Solubility of Gases and Liquids", Plenum Press, New York, <u>1976</u>, p.3.</pre>		

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Allinolia	Solubilities
COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>(1) Ammonia; NH<sub>3</sub>; [7664-41-7] (2) 2-Propanone (acetone);     C<sub>3</sub>H<sub>6</sub>0; [67-64-1]</pre>	Short, I.; Sahgal, A.; Hayduk, W. J. Chem. Eng. Data <u>1983</u> ,
VARIABLES:	PREPARED BY: W. Hayduk
EXPERIMENTAL VALUES:	
•	Sunsen Coefficient <sup>2</sup> Mole Fraction <sup>1</sup> $(cm^3 (STP)cm^{-3}atm^{-1}) = \frac{x_1}{2}$
263.15 70.9 298.15 30.1	73.6       0.1906         27.6       0.0842
$\Delta G^{\circ}/J \text{ mol}^{-1} = -RT \ln x_{1} = 707.08 T$ $\ln x_{1} = 1831.40/T - 8.61710$ $$	
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: A volumetric method using a glass apparatus was employed. Degassed solvent contacted the gas while flowing as a thin film, at a constant rate, through an absorption spiral into a solution buret. A constant solvent flow was obtained by means of a calibrated syringe pump. The solution at the end of the spiral was considered saturated. Dry gas was maintained at atmosphe- ric pressure in a gas buret by mechanically raising the mercury level in the buret at an adjustable rate. The solubility was calculated from the constant slope of volume of gas dissolved and volume of solvent injected. Degassing was accomplished using a two stage vacuum process described by Clever et al. (1).	SOURCE AND PURITY OF MATERIALS: 1. Liquid Carbonic. Specified minimum purity 99.99 per cent. 2. Canlab. Specified minimum purity 99.5 per cent. ESTIMATED ERROR: $\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$ REFERENCES: 1. Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M. J. Phys. Chem. <u>1957</u> , 61, 1078.

So Ammoni	a Solubilities
COMPONENTS: 1. Ammonia; NH3; [7664-41-7] 2. 1-Methyl-2-pyrrolidinone; C <sub>5</sub> H <sub>9</sub> NO; [872-50-4] VARIABLES: Temperature, pressure EXPERIMENTAL VALUES:	ORIGINAL MEASUREMENTS: Freidson, G. S.; Furmer, I. E.; Amelin, A. G. <u>1974</u> , VINITI deposited document 1697-74. PREPARED BY: P. G. T. Fogg
T/K p <sub>NH3</sub> /mmHg dissol	of gas, corrected .2 K and 760 mmHg, Mole # ved by one volume fraction <sup>#</sup> of solvent.* $x_{NH_3}$
which was given by the authors.	8.2       0.033         15.7       0.061         27.8       0.103         29.0       0.107         41.5       0.146         54.0       0.182         69.6       0.223         82.0       0.253         94.0       0.280         7.3       0.030         11.9       0.047         21.2       0.081         22.9       0.087         30.5       0.113         31.2       0.115         38.4       0.138
AUXILIAR	Y INFORMATION
METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (refs. 3, 4 and 5). A quantity of gas, measured by change in pressure of a known volume, was allowed into contact with solvent i a thermostatted absorption vessel. The liquid was magnetically stirred and the final pressure of gas in contact with solvent was measured. The authors gave the results in graphical form with volume of gas (corrected to 273.2 K and 1 atm) absorbed by one volume of solvent plotted as a function of gas pres- sure. One graph corresponded to pressures below 1 atm and a second graph to higher pressures.	graphic analysis indicated it to be 99.8% pure.

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COMPONENTS:		ORIGINAL MEASUREMENTS:	
l. Ammonia; Ni	H <sub>3</sub> ; [7664-41-7]	Freidson, G. S.; Fur	mer, I. E.;
2. 1-Methy1-2-	pyrrolidinone;	Amelin, A. G.	
C <sub>5</sub> H <sub>9</sub> NO; [8]		1974, VINITI deposite	d document
031191107 [0		1697-74.	
		2007 74.	
	<u>, , , , , , , , , , , , , , , , , , , </u>		
EXPERIMENTAL V	ALUES:	Volume of gas, corrected	Mole "
m i v	n / mmHg	to 273.2 K and 760 mmHg, dissolved by one volume	fraction <sup>#</sup>
T/K	p <sub>NH3</sub> /mmHg	of solvent.*	<sup><i>x</i></sup> NH 3
			NN 3
273.2	527	40.5	0.145
	590	45.7	0.160
	708	57.1	0.193
283.2	77	3.8 5.8	0.016 0.024
	108 170	8.3	0.034
	243	11.6	0.047
	342	17.0	0.067
	364	18.1	0.071
	429	22.2	0.086
	475	24.4 30.2	0.094 0.113
	567 631	33.9	0.126
	655	35.8	0.132
	713	. 39.3	0.143
298.2	89	3.3	0.014
	198	6.4	0.027
	220	6.8	0.029 0.037
	301	9.0 10.7	0.044
	350 508	15.7	0.064
	576	18.3	0.073
	603	18.7	0.075
	697	21.6	0.085
	736	23.7	0.093 0.011
313.2	113 183	2.6 3.8	0.017
	278	5.9	0.025
	294	5.9	0.025
	385	7.8	0.033
	416	8.2	0.035
	512	10.4 11.9	0.044 0.050
	586	13.8	0.057
	685 701	14.2	0.059
	758	15.9	0.066
328.2	175	2.6	0.012
	285	4.3	0.019
	331	4.6	0.020 0.025
	399	5.7 6.7	0.025
	479 570	8.0	0.035
	671	9.2	0.040
	740	10.2	0.044
348.2	167	1.2	0.006
	273	2.2	0.010
	324	2.7 3.3	0.012 0.015
	388	3.3	0.015
	410 504	4.5	0.020
	586	5.3	0.024
	595	5.3	0.024
	666 681	5.9 6.2	0.027 0.028
	748	6.1	0.028
* Values taken		c, from a graph showing experi	imental points
which was di	ven by the author	rs.	
<u># Calculated b</u>	y the compiler.	(cont.	

OMPONENTS:		ORIGINAL MEASUREMENTS:	
	H <sub>3</sub> ; [7664-41-7] pyrrolidinone; 72-50-4]	Freidson, G. S.; Fur Amelin, A. G. <u>1974</u> , VINITI deposite 1697-74.	
XPERIMENTAL V	ALUES:	Volume of gas, corrected	
/K	$p_{\rm NH_3}/$ atm *	to 273.2 K and 760 mmHg, dissolved by one volume of solvent.*	Mole fraction <sup>#</sup> <sup>x</sup> NH <sub>3</sub>
83.2	1.10	53	0.18
	1.92	93	0.28
	2.96	150	0.39
	3.85	280	0.54
	4.23	295	0.54
	4.29	319	0.57
	4.62	532	0.69
	4.88	572	0.71
	5.31	806	0.77
98.2	5.87	1173	0.83
	1.08	29	0.11
	2.29	58	0.20
	3.27	104	0.31
	5.08	198	0.46
	6.33	305	0.57
	6.73	378	0.62
	7.60	497	0.68
	8.08	636	0.73
	9.37	1277	0.85
13.2	3.17	61	0.21
	5.19	116	0.34
	6.88	176	0.44
	7.77	228	0.50
	9.50	340	0.60
	10.27	439	0.66
	10.50	467	0.67
	11.58	621	0.73
	12.60	827	0.79
	13.75	1350	0.86
28.2	3.75	39	0.15
	5.29	68	0.23
	6.25	98	0.31
	7.31	113	0.34
	8.46	145	0.40
	8.77	150	0.40
	9.52	190	0.46
	10.58	208	0.48
	11.62	266	0.55
	14.69	476	0.68
	16.15	699	0.76
	17.56	849	0.79
	19.13	1388	0.86
	, by the compiler ven by the author	c, from a graph showing exper	imental points
	y the compiler.		
	760 mmHg =	$1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$	

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Gerrard, W.; Maladkar, V.K. Chem. Ind. <u>1970</u> , 925-926.
<pre>2. ],1'-Oxybisoctane; C16H34O; [629-82-3]</pre>	Maladkar, V.K. Thesis, Univ. of London, <u>1970</u>
VARIABLES:	PREPARED BY: P.G.T. Fogg
EXPERIMENTAL VALUES:	
T/K Moles <sub>NH3</sub> /moles C	CleH34O (latm) Mole fraction <sup>*</sup> <sup>2</sup> NH3 (latm)
273.2 0.1	.0 0.09
* Calculated by compiler	
$1 atm = 1.013 \times 10^5 Pascal$	
	-
AUXILIARY	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Ammonia at barometric pressure was bubbled through a weighed quantity (about 2 g) of solvent in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calcul- ated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. Details of the	<ol> <li>Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>Dried over CaCl<sub>2</sub>; distilled under reduced pressure.</li> </ol>
apparatus are given in ref. (1).	ESTIMATED ERROR:
	<pre>REFERENCES: 1. Gerrard, W. "Solubility of Gases and Liquids", Plenum Press, New York, <u>1976</u>, p.3.</pre>

COMPONENTS :	ORIGINAL MEASUREMENTS:
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Gerrard, W.; Maladkar, V.K. Chem. Ind. <u>1970</u> , 925-926.
2. Acetic acid, octyl ester; C10H20O2; [112-14-1]	Maladkar V.K. Thesis, Univ. of London, <u>1970</u> .
VARIABLES:	PREPARED BY: P.G.T. Fogg.
EXPERIMENTAL VALUES:	
T/K Moles <sub>NH3</sub> /moles <sub>C10H20</sub> C	)2 (1 atm) Mole fraction* $x_{ m NH_3}$ (1 atm)
273.2 0.285	0.222
* Calculated by compiler	
$l atm = 1.013 \times 10^5$ Pascal	
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: Ammonia at barometric pressure was bubbled through a weighed quantity (about 2 g) of solvent in a glass vessel held in a thermostat until saturation was achieved. The concentration of ammonia was calcul- ated from the increase in weight of the vessel after an allowance had been made for the weight of ammonia in the gas phase above the saturated solution. Details of the apparatus are given in ref. (1).	<pre>SOURCE AND PURITY OF MATERIALS: 1. Obtained from a cylinder; dried     by KOH pellets and a cold trap. 2. Dried over CaCl<sub>2</sub>; distilled     under reduced pressure. ESTIMATED ERROR: REFERENCES: 1. Gerrard, W. "Solubility of Gases New York Pressure New York Press New York</pre>
	and Liquids", Plenum Press, New York, <u>1976</u> , p.3.

COMPONENTS:	OPT CINAL ACADEMENTE	
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	ORIGINAL MEASUREMENTS: Maladkar, V.K. Thesis, Univ. of	
2. Phosphorous acid, triethyl	London, <u>1970</u> .	
ester; C <sub>6</sub> H <sub>15</sub> O <sub>3</sub> P; [122-52-1]	(See also Gerrard, W.; Maladkar, V. K. Chem.Ind. <u>1970</u> , 925-926).	
VARIABLES: Pressure	PREPARED BY: P.G.T. Fogg.	
Pressure	F.G.I. FOGG.	
EXPERIMENTAL VALUES:		
T/K P <sub>NH3</sub> /mmHg Moles <sub>NH3</sub> /	/moles <sub>C6H15O3</sub> P Mole fraction *	
273,2 35	0.013 0.013	
273.2 225	0.076 0.071	
273.2 375 273.2 490	0.111 0.100 0.127 0.113	
273.2 790	0.153 0.133	
* Calculated by compiler. 760 mmHg = 1 atm = 1.013 x 10 <sup>5</sup> Pa	l.	
AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
Ammonia at barometric pressure	1. Obtained from a cylinder; dried	
was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 273.2 K. The glass vessel was then held in a thermostat at 273.2 K and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for the displacement of air by	by KOH pellets and a cold trap. 2. Distilled under reduced pressure.	
ammonia in the gas phase above the saturated solution.	ESTIMATED ERROR:	
Solubilities at low pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure of ammonia. Details of the apparatus are given in ref. (1).	REFERENCES: 1. Gerrard, W. "Solubility of Gases and Liquids", Plenum Press, New York, <u>1976</u> , p.3.	

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COMPONENTS:	ORIGINAL MEASUREMENTS:		
l. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Maladkar, V.K. Thesis,		
2. Phosphorous acid, dibutyl ester; C <sub>8</sub> H <sub>19</sub> O <sub>3</sub> P	Univ. of London, <u>1970</u> (See also Gerrard,W.;Maladkar,V.K. Chem.Ind. <u>1970</u> ,925-926)		
VARIABLES:	PREPARED BY: P.G.T. Fogg.		
EXPERIMENTAL VALUES:			
T/K $p_{\rm NH_3}/{\rm mmHg}$ Moles $_{\rm NH_3}/$	Mole fraction * <sup>w</sup> NH <sub>3</sub>		
273.2 100 273.2 200 273.2 300 273.2 500 273.2 700 273.2 750 Experimental results were present showing variation of mole ratio v curve. Numerical values given all this curve at arbitrary pressure * Calculated by the compiler.	vith pressure as a smooth pove have been taken from		
AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:		
Ammonia at barometric pressure was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 273.2K. The glass vessel was then held in a thermostat at 273.2 K and the new pressure of ammonia measured. The concentration of ammonia was calcul- ated from the increase in weight of the vessel after an allowance had been made for the displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure of ammonia. Details of the apparatus are given in ref (1).	<pre>phosphorous trichloride; distilled under reduced pressure; purity checked by infra-red spectroxopy. ESTIMATED ERROR: REFERENCES: 1. Gerrard, W. "Solubility of Gases and Liquids", Plenum Press, New York, 1976, p.3.</pre>		

<ul> <li>bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2K. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure</li> </ul>	COMPONENTS :	ORIGINAL MEASUREMENTS:	
Pressure       P.G.T. Fogg.         EXPERIMENTAL VALUES:       T/K       P <sub>NH3</sub> /mmHg       Moles <sub>NH3</sub> /moles       C18H1503P       Mole fraction *	<ol> <li>Ammonia; NH<sub>3</sub>; [7664-41-7]</li> <li>Phosphorous acid, triphenyl</li> </ol>	Maladkar, V.K. Thesis, Univ. of London, <u>1970</u> (See also Gerrard, W.; Maladkar,	
T/K       P <sub>NH3</sub> /mmHg       Moles <sub>NH3</sub> /moles       C1 sH1 sO 3P       Mole fraction *         293.2       60       0.0275       0.0268         293.2       125       0.1625       0.1398         293.2       295       0.1625       0.1398         293.2       425       0.2300       0.1770         293.2       485       0.2700       0.2126         293.2       750       0.3250       0.2453         Experimental values were given as points on a large scale graph.       *         *       Calculated by compiler.       760 mmHg = 1 atm = 1.013 x 10 <sup>5</sup> Pa         Source AND PURITY OF MATERIALS:         Ammonia at barometric pressure was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2X. and the new pressure of ammonia measured. The concentration of ammonia mac calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure       ESTIMATED ERROR:			
293.2       60       0.0275       0.0055         293.2       125       0.0875       0.005         293.2       295       0.1625       0.1398         293.2       425       0.2300       0.1870         293.2       425       0.2300       0.2453         Experimental values were given as points on a large scale graph.         * Calculated by compiler.         760 mmHg = 1 atm = 1.013 x 10 <sup>5</sup> Pa         SOURCE AND PURITY OF MATERIALS:         Ammonia at barometric pressure was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2X. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure       ESTIMATED ERROR:	EXPERIMENTAL VALUES:		
293.2       125       0.0875       0.0805         293.2       295       0.1625       0.1398         293.2       485       0.2300       0.1270         293.2       485       0.2300       0.2453         Experimental values were given as points on a large scale graph.         * Calculated by compiler.       760 mmHg = 1 atm = 1.013 x 10 <sup>5</sup> Pa         AUXILIARY INFORMATION         Method approximation of a solution of a weight of the vessel and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure       Source ERROR:	T/K P <sub>NH3</sub> /mmHg Moles <sub>NH3</sub> /	Mole fraction *	
<ul> <li>METHOD 'APPARATUS/PROCEDURE:</li> <li>Ammonia at barometric pressure was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2K. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure</li> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>I. Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>I. Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>I. Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>I. Distilled under reduced pressure</li> <li>Estimated from the for displacement of air by ammonia</li> <li>In the gas phase above the saturated solution. Solubilities at lower</li> <li>Estimated Errors:</li> </ul>	293.2 125 293.2 295 293.2 425 293.2 485 293.2 750 Experimental values were given as * Calculated by compiler.	0.0875 0.0805 0.1625 0.1398 0.2300 0.1870 0.2700 0.2126 0.3250 0.2453 points on a large scale graph.	
<ul> <li>Ammonia at barometric pressure was bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2K. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure</li> <li>1. Obtained from a cylinder; dried by KOH pellets and a cold trap.</li> <li>2. Distilled under reduced pressure</li> <li>ESTIMATED ERROR:</li> </ul>	AUXILIARY	INFORMATION _	
<ul> <li>bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2K. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure</li> <li>by KOH pellets and a cold trap.</li> <li>Distilled under reduced pressure</li> <li>ESTIMATED ERROR:</li> </ul>	METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
Details of the apparatus are given 1. Gerrard, W. "Solubility of	bubbled through a weighed quantity of solvent (about 2 g) in a glass vessel at a few degrees below 293.2K. and the new pressure of ammonia measured. The concentration of ammonia was calculated from the increase in weight of the vessel after an allowance had been made for displacement of air by ammonia in the gas phase above the saturated solution. Solubilities at lower pressures were calculated from weight changes when solutions which had been previously saturated at higher pressures were allowed to come to equilibrium under a lower pressure of ammonia. Details of the apparatus are given	by KOH pellets and a cold trap. 2. Distilled under reduced pressure. ESTIMATED ERROR: REFERENCES: 1. Gerrard, W. "Solubility of Gases and Liquids," Plenum Press,	

COMPORENTS: 1. Armonia; NH;; [7664-41-7] 2. Phosphoric acid, tributyl ester (tributyl phosphate); C <sub>12H2700.F7</sub> [126-73-8] VARIABLES: Temperature Temperatu	CONDONENTE	······································	ODICINAL MERCHIDEN	
2. Phosphoric acid, tributyl ester (tributyl phosphate); C <sub>12H27</sub> O.P; [126-73-8] VARIABLES: Temperature Temperature T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction <sup>*</sup> T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction MoleS T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction MoleS T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction form Matheson Co., T/K mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO <sub>4</sub> (1 atm) Mole fraction Mol <sub>N</sub> (1 atm) Mole fraction form Matheson Mol <sub>N</sub> ,				
(tributyl phosphate); C <sub>12</sub> H <sub>27</sub> 0.Pr [126-73-8]       1970, 3242-3246.         VARIABLES: Temperature       PREPARED BY: P. G. T. Fogg         ZYX       mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)       Mole fraction* x <sub>NH3</sub> (1 atm)         EXPERIMENTAL VALUES: T/X       mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)       Mole fraction* x <sub>NH3</sub> (1 atm)         Z43.2       1.26       1.19       1.22       0.55         Z33.2       0.62       0.60       0.38       0.26         Z33.2       0.21       0.20       0.17       0.13         Z93.2       0.11       0.10       0.10       0.09         I atm = 1.013 × 10 <sup>4</sup> Pa.       *       Calculated by compiler.       0.13         KETHOD/APPARATUS/PROCEDURE:       SOURCE AND PURITY OF MATERIALS:       .         Memonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached via taperso an evacuated sample collector. Bcuilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against atkalk to give the weight of       EFERENCES:         EXTIMATED ERBOR:       EFERENCES:	1. Ammonia; NH3; [7664-41-7	Hála, J.; Tuck, D. G.		
(126-73-8)     PREPARED BY:       Temperature     P. G. T. Fogg       ZXMIABLES:     PREPARED BY:       T/K     mol <sub>NH,1</sub> /mol <sub>Bu,PO,</sub> (1 atm)     Mole fraction* xNH, (1 atm)       EXPERIMENTAL VALUES:     P. G. T. Fogg       Z43.2     1.26     1.19     1.22       243.2     0.62     0.60     0.61     0.38       253.2     0.62     0.20     0.25     0.17       263.2     0.31     0.10     0.10     0.09       233.2     0.11     0.10     0.10     0.09       I atm = 1.013 × 10 <sup>4</sup> Pa.     *     Calculated by compiler.       AUXILIARY INFORMATION       NETHOD /APPARATUS/FROCEDURE:       Ammonia at a pressure of 1 atm     Source And Putity OF MATERIALS;       Memonia at a pressure of 1 atm     Source And Putity OF MATERIALS;       Meride the boolynet in a thermostattached vid taps to an evacuated     1. Obtained from Matheson Co., ontained y pasatus       saturation was reached in about 1     0. Obtained from Fisher Scientific       Co. Tor sub of the sample col-     0. Obtained from Fisher Scientific       Co. Tor sub of the sample col-     0. Ottained from Fisher Scientific       Soution run into the sample col-     0. Obtained from Fisher Scientific       Contor to of the saturated     0. Obtained from Subatentific	2. Phosphoric acid, tributyl ester		J. Chem. Soc. (A)	
[126-73-8]         VARIABLES:         Temperature         T/K         mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)         EXPERIMENTAL VALUES:         T/K         mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)         EXPERIMENTAL VALUES:         T/K         mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)         EXPERIMENTAL VALUES:         T/K         mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)         EXPERIMENTAL VALUES:         T/K         mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)         EXPC.         243.2         1.26         1.26         0.52         233.2         0.12         0.11         0.10         1 atm = 1.013 × 10 <sup>5</sup> Pa.         *         Calculated by compiler.         *         Obtained from Matheson Co., Ontario, dried by passing through Cao and then KOH.         through the solvent in a thermo- statted bubbling apaparatus attachod vid tappe of the sample col- lector which was then	(tributyl phosphate); C <sub>12</sub>	H <sub>27</sub> 04P;	1970, 3242-3246.	
Temperature     P. G. T. Fogg       EXPERIMENTAL VALUES:     T/K     mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO4 (1 atm)     Mole fraction* x <sub>NH3</sub> (1 atm)       243.2     1.26     1.19     1.22     0.55       253.2     0.62     0.60     0.35       263.2     0.34     0.35     0.32       273.2     0.21     0.20     0.21       233.2     0.16     0.15     0.13       233.2     0.11     0.10     0.09   I atm = 1.013 × 10 <sup>5</sup> Pa.       AUXILIARY INFORMATION   Method APPARATUS/PROCEDURE:       Source AND FURITY OF MATERIALS:   Auxiliary information was reached in about 1 hour buck a period of 8 hours was normally allowed. Taps were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of f   FEFERENCES: REFERENCES:	[126-73-8]		<u></u> ,	
Temperature     P. G. T. Fogg       EXPERIMENTAL VALUES:     T/K     mol <sub>NH3</sub> /mol <sub>Bu3</sub> PO, (1 atm)     Mole fraction*       243.2     1.26     1.19     1.22     0.55       253.2     0.62     0.60     0.35     0.26       253.2     0.12     0.21     0.20     0.21       263.2     0.12     0.21     0.20     0.11       263.2     0.16     0.15     0.13       263.2     0.16     0.15     0.13       273.2     0.11     0.10     0.09         1 atm = 1.013 × 10 <sup>5</sup> Pa.         * Calculated by compiler.         METHOD'APPARATUS/PROCEDURE:         Ammonia at a pressure of 1 atm       was passed via a sinter disc inlet       through the solvent in a thermo-       attached via taps to an evacuated       sample collector. Eouilibrium       saturation was reached in about 1       hour but a period of 8 hours was       normally allowed. Taps were then       distilled into standard aqueous       subsequently back-titrated against       REFERENCES:   EFFERENCES:	VARIABLES:		PREPARED BY:	
EXPERIMENTAL VALUES: T/K $mol_{NH_3}/mol_{Bu_3PO_4}$ (1 atm) $mole fraction^*_{NH_3}$ (1 atm) Expt. values Mean 243.2 1.26 1.19 1.22 0.55 253.2 0.62 0.60 0.61 0.38 263.2 0.34 0.35 0.35 0.26 273.2 0.21 0.20 0.20 0.17 283.2 0.16 0.15 0.15 0.13 293.2 0.11 0.10 0.10 0.09 1 atm = 1.013 × 10 <sup>5</sup> Pa. * Calculated by compiler. METHOD/APPARATUS/PROCEDURE: Ammonia at a pressure of 1 atm was passed <i>yia</i> a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached <i>yia</i> ta sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached <i>yia</i> ta sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached <i>yia</i> ta spressure of 1 atm was passed <i>yia</i> a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached <i>yia</i> ta spressure of 1 atm was passed <i>yia</i> a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attrached <i>yia</i> taps to an evacuated solution run into the sample col- lector which was then detached and weighed to give the weight of the distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against REFERENCES: REFERENCES:				
$T/K \qquad mol_{\rm NH_3}/mol_{\rm Bu_3PO_4} (1 atm) \qquad Mole fraction* \\ x_{\rm NH_3} (1 atm) \\ Expt. values \qquad Mean \\ \hline \\ 243.2 & 1.26 & 1.19 & 1.22 & 0.55 \\ 253.2 & 0.62 & 0.60 & 0.61 & 0.38 \\ 263.2 & 0.34 & 0.25 & 0.35 & 0.26 \\ 273.2 & 0.21 & 0.20 & 0.20 & 0.17 \\ 283.2 & 0.16 & 0.15 & 0.15 & 0.13 \\ 293.2 & 0.11 & 0.10 & 0.10 & 0.09 \\ \hline \\ 1 atm = 1.013 \times 10^5 \ Pa. \\ \hline \\ \hline \\ Kethod/APPARATUS/PROCEDURE: \\ \hline \\ AUXILIARY INFORMATION \\ \hline \\ METHOD/APPARATUS/PROCEDURE: \\ \hline \\ Ammonia at a pressure of 1 atm \\ was passed via a sinter disc inlet through the solvent in a thermostatated bubbling apparatus attached wia taps to an evacuated ample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample collector. Keylet of the saturated solution run into the sample collector. Heat at eached and weighed to give the weight of the saturated subsequently back-titrated against alkali to give the weight of the sample collector was then detached and weighed to give the weight of the sample collector wich was then detached against alkali to give the weight of the sample collector. Keylet the sample collector wich was then detached against alkali to give the weight of the sample collector. Keylet the sample collector wich was then detached against alkali to give the weight of the sample collector. Keylet the sample collector was basequently back-titrated against alkali to give the weight of the sample collector wich was then detached against alkali to give the weight of the sample collector. Setting the solution the sample collector was basequently back-titrated against alkali to give the weight of the sample collector. Setting the solution the sample collector was based was a subsequently back-titrated against alkali to give the weight of the sample collector. Setting the solution the sample collector was based was based with the solution the sample collector. Setting the solution the sample collector was based w$	Iemperature		1. 0. 1. 1039	
$T/K \qquad mol_{\rm NH_3}/mol_{\rm Bu_3PO_4} (1 atm) \qquad Mole fraction* x_{\rm NH_3} (1 atm) \\ Expt. values Mean \\ \hline \\ 243.2 1.26 1.19 1.22 0.55 \\ 253.2 0.62 0.60 0.61 0.38 \\ 263.2 0.34 0.25 0.35 0.26 \\ 273.2 0.21 0.20 0.20 0.17 \\ 283.2 0.16 0.15 0.15 0.13 \\ 293.2 0.11 0.10 0.10 0.10 0.09 \\ \hline \\ 1 atm = 1.013 \times 10^5 Pa. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ \hline \\ K Calculated by compiler. \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ K F F RENCES: \\ \hline \\ \hline \\ \hline \\ K F F RENCES: \\ \hline \\ \hline \\ \hline \\ K F F RENCES: \\ \hline \\ \hline \\ \hline \\ K F F RENCES \\ \hline \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ \hline \\ \hline \\ \hline \\ \hline \\ K F F R C S \\ \hline \\ K F F R C S \\ \hline \\$	EXPERIMENTAL VALUES:			
Expt. values     Mean       243.2     1.26     1.19     1.22     0.55       233.2     0.62     0.60     0.61     0.38       263.2     0.34     0.35     0.26       273.2     0.21     0.20     0.20     0.17       283.2     0.16     0.15     0.13       293.2     0.11     0.10     0.09         I atm = 1.013 × 10 <sup>5</sup> Pa.       * Calculated by compiler.         * Calculated by compiler.         Source AND PURITY OF MATERIALS:         Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermostatated bubling apparatus attathed buids taps to an evacuated sample collector. Equilibrium saturation was reached in about 1     Source AND PURITY OF MATERIALS:         1. Obtained from Matheson Co., Ontario, dried by passing through CaO and then KOH.       2. Obtained from Fisher Scientific Co.; refluxed with aqueous NAOH, tried wia tapeous NAOH, dried at 50 °C in vaauo in a stream of dry N2.       opened to let some of the saturated and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochoric acid which was subsequently back-titrated against alkali to give the weight of		PO4 (1 a	atm) Mole fraction <sup>*</sup> $x_{\rm NH_2}$ (1 atm)	
233.2       0.62       0.60       0.61       0.38         263.2       0.34       0.35       0.26         273.2       0.21       0.20       0.17         283.2       0.16       0.15       0.13         293.2       0.11       0.10       0.10         1 atm = 1.013 × 10 <sup>5</sup> Pa.       *         AUXILIARY INFORMATION         METROD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS: <tr< td=""><td>Expt. values</td><td>Mean</td><td></td></tr<>	Expt. values	Mean		
233.2       0.62       0.60       0.61       0.38         263.2       0.34       0.35       0.26         273.2       0.21       0.20       0.17         283.2       0.16       0.15       0.13         293.2       0.11       0.10       0.10         1 atm = 1.013 × 10 <sup>5</sup> Pa.       *         AUXILIARY INFORMATION         METROD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS: <tr< td=""><td><u></u></td><td></td><td></td></tr<>	<u></u>			
233.2       0.62       0.60       0.61       0.38         263.2       0.34       0.35       0.26         273.2       0.21       0.20       0.17         283.2       0.16       0.15       0.13         293.2       0.11       0.10       0.10         1 atm = 1.013 × 10 <sup>5</sup> Pa.       *         AUXILIARY INFORMATION         METROD/APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         AUXILIARY INFORMATION         METROD /APPARATUS/PROCEDURE:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS:         Auxiliary INFORMATION         SOURCE AND PURITY OF MATERIALS: <tr< td=""><td></td><td>1.22</td><td>0.55</td></tr<>		1.22	0.55	
273.2       0.21       0.20       0.17         283.2       0.16       0.15       0.13         293.2       0.11       0.10       0.09         1 atm = 1.013 × 10 <sup>5</sup> Pa.       *         * Calculated by compiler.	253.2 0.62 0.60	0.61	0.38	
223.2       0.16       0.15       0.15       0.13         293.2       0.11       0.10       0.09         I atm = 1.013 × 10 <sup>5</sup> Pa.         * Calculated by compiler.         * Calculated by compiler.         * Calculated by compiler.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Auxiliary INFORMATION         Auxiliary INFORMATION         Superior Auxiliary Auxiliary Auxiliary Auxiliary Auxiliary Auxiliary Auxiliary Au			0.17	
I atm = 1.013 × 10 <sup>5</sup> Pa.         * Calculated by compiler.         * Calculated by compiler.         AUXILIARY INFORMATION         METHOD/APPARATUS/PROCEDURE:         Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermostatted bubbling apparatus attacted via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample collector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of       Source AND PURITY OF MATERIALS:         I. Obtained from Matheson Co., Ontario; dried by passing through CaO and then KOH.       Cobtained from Fisher Scientific Co.; refluxed with aqueous NaOH, treated with anhydrous MgSO <sub>4</sub> , dried at 50 °C in vacuo in a stream of dry N <sub>2</sub> .         ESTIMATED ERROR:       ESTIMATED ERROR:	283.2 0.16 0.15	0.15	0.13	
* Calculated by compiler. AUXILIARY INFORMATION METHOD/APPARATUS/PROCEDURE: Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermo- stated bubbling apparatus attached via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample col- lector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of	293.2 0.11 0.10	0.10	0.09	
METHOD/APPARATUS/PROCEDURE:SOURCE AND PURITY OF MATERIALS:Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attached via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample col- lector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight ofSOURCE AND PURITY OF MATERIALS:1. Obtained from Matheson Co., Ontario; dried by passing through CaO and then KOH.2. Obtained from Fisher Scientific Co.; refluxed with aqueous NaOH, treated with anhydrous MgSO4, dried at 50 °C in vacuo in a stream of dry N2.ESTIMATED ERROR:	Calculated	by comp	iler.	
<ul> <li>Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through the solvent in a thermostatted bubbling apparatus attached via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample collector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of</li> <li>Ammonia at a pressure of 1 atm was passed via a sinter disc inlet through CaO and then KOH.</li> <li>Obtained from Fisher Scientific Co: refluxed with aqueous NaOH, treated with anhydrous MgSO<sub>4</sub>, dried at 50 °C in vacuo in a stream of dry N<sub>2</sub>.</li> </ul>	A	UXILIARY	INFORMATION	
<ul> <li>was passed via a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attached via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample col- lector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of</li> <li>Ontario; dried by passing through CaO and then KOH.</li> <li>Obtained from Fisher Scientific Co.; refluxed with aqueous NaOH, treated with anhydrous MgSO<sub>4</sub>, dried at 50 °C in vacuo in a stream of dry N<sub>2</sub>.</li> </ul>	METHOD / APPARATUS / PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
	was passed via a sinter disc inlet through the solvent in a thermo- statted bubbling apparatus attached via taps to an evacuated sample collector. Equilibrium saturation was reached in about 1 hour but a period of 8 hours was normally allowed. Taps were then opened to let some of the saturated solution run into the sample col- lector which was then detached and weighed to give the weight of the sample. Contents were then distilled into standard aqueous hydrochloric acid which was subsequently back-titrated against alkali to give the weight of		<ol> <li>Obtained from Matheson Co., Ontario; dried by passing through CaO and then KOH.</li> <li>Obtained from Fisher Scientific Co.; refluxed with aqueous NaOH, treated with anhydrous MgSO<sub>4</sub>, dried at 50 °C <i>in vacuo</i> in a stream of dry N<sub>2</sub>.</li> <li>ESTIMATED ERROR:</li> </ol>	

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COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Furmer, I. E.; Amelin, A. G.;
	Freidson, G. S.
2. 1,2,3-Propanetriol triacetate	The Most thim Taknal Inch
(glyceryl triacetate, triacetin);	1974, 79, 96–98.
$C_{9}H_{14}O_{6};$ [102-76-1]	<u>1574</u> , 75, 90-98.
VARIABLES:	
	PREPARED BY:
Temperature, pressure	P. G. T. Fogg
	<u> </u>
EXPERIMENTAL VALUES:	
T/K Henry's Constant I /mmHg	Mole fraction (1 atm)#
/ 100179	<sup>x</sup> C <sub>9</sub> H <sub>1</sub> 4O <sub>6</sub>
298.2         4600           313.2         6760	0.165 0.112
328.2 9700	0.078
* Henry's constant = $p_{\rm NH_3}/x_{\rm NH_3}$ where the liquid phase.	$x_{ m NH_3}$ is the mole fraction of $ m NH_3$ in
Calculated by the compiler on the a constant is valid for 1 atm.	assumption that the Henry's law
Results were given in the form of small Henry's constants. One graph shows to of gas (corrected to 1 atm and 273.2 varied linearly with pressure for pre- graph shows that the variation was not Henry's law constants, $H$ , based upon given for three temperatures. Value H/mmHg = 7.03 - 0 The compiler considers that this is e	that, at each temperature, the volume K) absorbed by one volume of liquid essures to about 1 atm. A second on-linear at higher pressures. measurements at or below 1 atm, were es were said to fit the equation:
write	
$log_{10}$ ( <i>H</i> /mmHq) = 7.03 -	
	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Apparatus described previously was used (refs. 1, 2 and 3). A quantity of gas, measured by changes in pres- sure of a known volume, was allowed into contact with solvent in a thermostatted absorption vessel. The liquid was magnetically stirred and the final pressure of gas in contact with solvent was measured.	
	ESTIMATED ERROR:
	<pre>REFERENCES: 1. Braude, G.E.; Leites, I.L.;     Dedova, I.V. Khim. Prom. <u>1961</u>, 232. 2. Braude, G.E.; Shakhova, S.F.     Khim. Prom. <u>1961</u>, 177. 3. Shenderei, E.R.; Zel'venskii, Ya.D;     Ivanovskii, F.P. Khim. Prom. <u>1960</u>,     370.</pre>

<pre>COMPONENTS:     1. Armonia; NH<sub>3</sub>; [7664-41-7]     2. Triethoxysilane; C<sub>6</sub>H<sub>16</sub>O<sub>3</sub>Si;     [998-30-1]</pre>		ORIGINAL MEASUREMENTS: Ditsent, V.E.; Zolotareva, M.N. Zh. Fiz. Khim. <u>1973</u> , 47, 1045; Russ. J. Phys. Chem. <u>1973</u> , 47, 595. (Brief details given in the above paper. Complete article deposited at VINITI. No. 5307-73, dep. from 3 Jan. <u>1973</u> .)		
•		PREPARED E	3Y:	
Pressure, te	mperature		P. G.	T. Fogg
TAL VALUES:		1		
$p_{\rm NH_3}/{\rm mmHg}$	Mole fraction <sup>x</sup> NH <sub>3</sub>	Т/К	$p_{\rm NH_3}/{\rm mmHg}$	Mole fraction <sup>x</sup> NH <sub>3</sub>
100 200 300 400 500 600	0.0149 0.0295 0.0445 0.0595 0.0742 0.0890	303.2	100 200 300 400 500 600	0.0073 0.0143 0.0213 0.0285 0.0356 0.0426
100 200 300 400 500 600	0.0113 0.0223 0.0335 0.0445 0.0555 0.0665	313.2	700 100 200 300 400 500 600 700	0.0499 0.0058 0.0115 0.0173 0.0227 0.0283 0.0338 0.0394
100 200 300 400 500 600 700	$\begin{array}{r} 0.0087 \\ 0.0179 \\ 0.0268 \\ 0.0360 \\ 0.0449 \\ 0.0535 \\ 0.0627 \end{array}$	323.2 = 1.013 ×	100 200 300 400 500 600 700 10 <sup>5</sup> Pa.	0.0051 0.0101 0.0155 0.0206 0.0258 0.0310 0.0362
	AUXILIARY	INFORMATIO	)N	
PARATUS / PROCEDU				TERIALS:
thod and appa d in refs. () n weight of a in a known w e resulting t asured by a m	aratus are de- .) and (2). ammonia was dis- veight of solvent cotal pressure manometer.	<ol> <li>To s drie by v</li> <li>Prep chro</li> </ol>	pecification d over solid acuum distil ared from Si matography i	GOST 6221-70; KOH; purified lation.
2.				,
				authors)
		REFERENCE 1. Tsik 2h. 1958 2. Tsik Shen	<pre>S: lis, D. S.; Fiz. Khim. , 32, 1476. lis, D. S.; derei, L. I.</pre>	Svetlova, G. M. Kofman, A. N.;
	thoxysilane; -30-1] Pressure, te AL VALUES: p <sub>NH3</sub> /mmHg 100 200 300 400 500 600 700 700 700 700 700 700 700 700 7	thoxysilane; $C_6H_{16}O_3Si;$ -30-1] Pressure, temperature AL VALUES: $p_{NH_3}/mmHg$ Mole fraction $m_{NH_3}$ 100 0.0149 200 0.0295 300 0.0445 400 0.0595 500 0.0742 600 0.0890 700 0.1065 100 0.0113 200 0.0223 300 0.0335 400 0.0445 500 0.0555 600 0.0665 700 0.0778 100 0.0087 200 0.0778 100 0.0087 200 0.0179 300 0.0268 400 0.0360 500 0.0449 600 0.0535 700 0.0627 760 mmHg = 1 atm AUXILIARY PARATUS/PROCEDURE: thod and apparatus are de- i in refs. (1) and (2). a weight of ammonia was dis- in a known weight of solvent a resulting total pressure asured by a manometer. a tures were controlled to	nia; NH <sub>3</sub> ; [7664-41-7] thoxysilane; C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; -30-1] Pressure, temperature TAL VALUES: $P_{\rm NH_3}/\rm mmHg$ Mole fraction T/K	nia; NH <sub>3</sub> ; [7664-41-7]       Zh. Fiz. Khm. 1973 Russ. J. Phys. Chem opaper. Complete ar at VINITI. No. 530 3 Jan. 1973.)         -30-1]       PREPARED EY:         Pressure, temperature       P. G.         TAL VALUES:       P. MH <sub>3</sub> /mmHg         Mole fraction $x_{NH_3}$ T/K         100       0.0149       303.2         100       0.0295       200         300       0.0445       300         400       0.0595       400         500       0.0742       500         600       0.0890       600         700       0.1065       300         300       0.0445       400         500       0.0742       500         600       0.0665       600         700       0.1065       500         100       0.0870       700         100       0.0665       600         700       0.0665       600         700       0.0665       600         700       0.0667       700         100       0.0687       323.2       100         200       0.0268       300       400         500       0.0627       700       700

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7]</pre>	Bell, R.P.
2. Aliphatic chloro-compounds.	J. Chem. Soc. <u>1931</u> , 1371-1382.
VARIABLES:	PREPARED BY: C.L. Young.
EXPERIMENTAL VALUES: Solvent T/K	Partition Mole fraction § coefficient, of ammonia in s <sup>+</sup> liquid, x <sub>NH3</sub>
Tetrachloromethane; (Carbon tetrachloride); CCl <sub>4</sub> ; [56-23-5] 293.15	7.17 0.0281
<pre>l,2-Dichloroethane; (Ethylene chloride); C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>; [107-06-2]</pre>	26.6 0.0797
Trichloromethane; (Chloroform); CHCl <sub>3</sub> ; [67-66-3]	69.8 0.193
§ for a partial pressure of 101.325	- KPa.
AIIXTLIARY	INFORMATION
	·
METHOD/APPARATUS/PROCEDURE: Volumetric apparatus consisting of bulb (~50cm <sup>3</sup> capacity) extended at the top as a graduated tube and joined at bottom to a capillary u-tube. Liquid saturated with gas at atmospheric pressure. Gas with- drawn in a current of air, absorbed in hydrochloric acid. Excess hydrochloric acid titrated with sodium hydroxide.	<ul> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>1. Obtained from cylinder, no other details given.</li> <li>2. Merck and Kahlbaum samples dried over calcium chloride and fractionally distilled.</li> </ul>
	$\delta T/K = \pm 0.1; \ \delta x_{\rm NH_3} = \pm 1\%.$
	(estimated by compiler) REFERENCES:

AL MEASUREMENTS:		
TERDORATIENTS.		
Seward, R.P.		
Am. Chem. Soc. <u>1932</u> ,54, 4598-605.		
ED BY: P.G.T. Fogg.		
NH3 /mmHg Mole fraction in * liquid phase <sup>x</sup> NH3		
$453.5$ 0.0841 $325.4$ 0.0656 $245.4$ 0.0515 $151.3$ 0.034 $139.2$ 0.0310 $88.1$ 0.0196 $41.2$ 0.00928 $31.9$ 0.00713 $14.0$ 0.00316         Hg = 1 atm = 1.013 x 10 <sup>5</sup> Pa         given as $1.480 \pm 0.002$ g cm <sup>-3</sup> ng $1.315 \text{ mol}_{\text{NH}_3} \text{dm}^3$ was given         sities of other solutions by         ween molar concentration and         le fraction concentrations.		
ATION		
AND PURITY OF MATERIALS:		
U.S.P. standard; traces of ethanol removed by conc. H <sub>2</sub> SO <sub>4</sub> or anhydrous ZnCl <sub>2</sub> ; washed and dried over K <sub>2</sub> CO <sub>3</sub> ; 0.1 wt % ethanol then added to inhibit oxidation.		

COMPONENTS	OPTOTWAL MELOUPPLETUNG		
COMPONENTS: 1. Ammonia: NH: [7664-41-7]	ORIGINAL MEASUREMENTS: Gerrard, W.; Maladkar, V.K. Chem. Ind. <u>1970</u> , 925-926.		
<pre>2. l-Chlorooctane; C<sub>8</sub>H<sub>16</sub>Cl; [111-85-3]</pre>	Maladkar, V.K. Thesis, Univ. of London, <u>1970</u>		
VARIABLES:	PREPARED BY:		
	P.G.T. Fogg		
EXPERIMENTAL VALUES:			
T/K Moles NH3 <sup>/moles</sup> C	C <sub>8</sub> H <sub>27</sub> Cl (l atm) Mole fraction <sup>*</sup> $x_{\rm NH_3}$ (l atm.)		
273.2 0.24	6 0.197		
* Calculated by compiler.			
$1 \text{ atm} = 1.013 \times 10^5 \text{ Pascal}$			
$I atm = 1.013 \times 10^{\circ} Pascal$			
AUXILIARY	INFORMATION -		
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:		
Ammonia at barometric pressure was	1. Obtained from a cylinder; dried		
bubbled through a weighed quantity	by KOH pellets and a cold trap.		
(about 2 g) of solvent in a glass vessel held in a thermostat until	2. Dried over $CaCl_2$ ; distilled		
saturation was achieved. The concentration of ammonia was calcul-	under reduced pressure.		
ated from the increase in weight of			
the vessel after an allowance had been made for the weight of ammonia			
in the gas phase above the saturated			
solution. Details of the apparatus are given in ref. (1).			
	ESTIMATED ERROR:		
	DEPENDING -		
	REFERENCES:		
	<ol> <li>Gerrard, W. "Solubility of Gases and Liquids", Plenum Press, New York, <u>1976</u> p.3.</li> </ol>		

Short, I.; Sahgal, A.; Hayduk, W. J. Chem. Eng. Data <u>1983</u> , EPARED BY: W. Hayduk
EPARED BY:
W. Hayduk
sen Coefficient <sup>2</sup> Mole Fraction <sup>1</sup> <sup>3</sup> (STP) cm <sup>-3</sup> atm <sup>-1</sup> $10^4 x_1$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
riginal data was used to determine n $x_1$ and table of smoothed values: n $T$ - 2391.2 $T$ - 167.80 T + 29.1412
$\frac{T/K}{10^{-4} \Delta G^{\circ}/J \text{ mol}^{-1}} \frac{10 x_1}{10 x_1}$
303.158.220367.2313.159.029297.8323.159.855243.2333.1510.69200.0
FORMATION
DURCE AND PURITY OF MATERIALS:
<ol> <li>Liquid Carbonic. Specified minimum purity 99.99 per cent.</li> <li>Canlab. Baker Analyzed grade of minimum specified purity 99.0 per cent.</li> </ol>
$\delta T/K = 0.1$ $\delta x_1/x_1 = 0.01$ EFERENCES:
<ol> <li>Clever, H.L.; Battino, R.; Saylor, J.H.; Gross, P.M.</li> <li>J. Phys. Chem. <u>1957</u>, 61, 1078.</li> </ol>

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Ammonia; NH <sub>3</sub> ; [7664-41-7]	Chang, E.T.; Gocken, N.A. Poston, T.M.; J. Chem. Engng. Data. <u>1971</u> , 16, 404-8 PREPARED BY: C.L. Young	
2. Hydrazine; N <sub>2</sub> H <sub>4</sub> ; [302-01-2]		
VARIABLES: Temperature, pressure		
EXPERIMENTAL VALUES:	- · ·	
$T/K$ $p^+/atm$ $p^+/kP_{c}$	Mole fraction of ammonia a in liquid, $x_{\rm NH_3}$	
278.12 0.3857 0.6818 1.0351 1.04.8 1.9597 198.5	8 0.1003 8 0.1481	
298.16 0.2812 28.4 0.5695 54.6 0.8516 86.2 1.2207 123.6	9     0.0218       5     0.0444       9     0.0661       9     0.0975	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	9 0.0171 9 0.0334 2 0.0501 L 0.0689	
AUXILIARY	INFORMATION	
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:	
Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathet- ometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorption. Solvent carefully	<ol> <li>Research grade gas, purity 99.99 mole per cent minimum.</li> <li>Sample of purity 99 mole per cent further purified by double vacuum distillation.</li> </ol>	
degassed.	ESTIMATED ERROR:	
	$\delta T/K = \pm 0.1;  \delta p/kPa = \pm 0.01;$ $\delta x_{NH_3} < \pm 2\%.$	
	REFERENCES:	

COMPONENTS		ORIGINAL MEASUREMENTS:
COMPONENTS: 1. Ammonia; NH <sub>3</sub> ; [7664-41-7]		Chang, E.T.; Gocken, N.A. Poston,
1. Annonia, Mili, [/004 41 /]		T.M.
2. Methylhydrazine; N <sub>2</sub> H <sub>3</sub> CH <sub>3</sub> ; [60-34-4]		J. Chem. Engng. Data. <u>1971</u> , 16, 404-8
VARIABLES:		PREPARED BY:
Temperatu	re, pressure	C.L. Young
EXPERIMENTAL VALUES:		1
T/K	$p^+/atm$ $p^+/kPa$	Mole fraction of ammonia in liquid, x <sub>NH3</sub>
253.17	0.1561 15.82	0.0786
2JJ•11	0.2693 27.29	
273.15	0.1825 18.49	
	0.5266 53.36	
293.15	0.3425 34.70	
	0.6206 62.88 1.0055 101.88	
	+ partial pressure	of ammonia.
	AUXILIARY	INFORMATION
METHOD <sup>/</sup> APPARATUS / PROCEDURE :		SOURCE AND PURITY OF MATERIALS:
Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathet- ometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorbtion. Solvent carefully degassed.		<ol> <li>Research grade gas, purity 99.99 mole per cent minimum.</li> <li>Sample of purity 99 mole per cent, further purified by double vacuum distillation.</li> </ol>
]		BUTTATED ERROR:
		$\delta T/K = \pm 0.1; \ \delta p/kPa = \pm 0.01; \ \delta x_{NH_3} < \pm 2$
		REFERENCES :

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COMPO	COMPONENTS:			ORIGINAL MEASUREMENTS:	
1.			7]	Chang, E.T.; Gocken, N.A.; Poston,	
2.	2. 1,1-Dimethylhydrazine; N <sub>2</sub> H <sub>2</sub> (CH <sub>3</sub> ) <sub>2</sub> [57-14-7]		N <sub>2</sub> H <sub>2</sub> (CH <sub>3</sub> ) <sub>2</sub>	T.M. J. Chem. Engng. Data. <u>1971</u> , 16, 404- 8	
VARIA	ABLES:			PREPARED BY:	
	Temperat	ture, pressure	e	C.L. Young	
EXPER	RIMENTAL VALUE	S:			
	T/K	p <sup>+</sup> /atm	p <sup>+</sup> /kPa	Mole fraction of ammonia in liquid, x <sub>NH3</sub>	
	253.17	0.0752 0.2328 0.9413 1.5035	7.62 23.59 95.38 152.34	0.0320 0.0973 0.3315 0.6222	
	273.15	0.3133 0.4827 1.1635 1.8406	31.75 48.91 117.89 186.50	0.0650 0.0982 0.2456 0.3963	
	293.14	0.3336 0.7237 0.9594 1.4999 2.1459	33.80 73.33 97.21 151.98 217.43	0.0363 0.0786 0.1042 0.1662 0.2377	
				-	
			AUXILIARY	INFORMATION *	
METHO	D /APPARATUS / PI	ROCEDURE :		SOURCE AND PURITY OF MATERIALS:	
METHOD APPARATUS PROCEDURE: Volumetric apparatus consisting of solvent vessel and buret with three calibrated bulbs. Pressure measured with mercury manometer and cathetometer. Solvent stirred with magnet enclosed in glass. Mole fraction absorbed calculated from knowledge of amount of gas before and after absorption. Solvent carefully degassed.		with essure eter and ced with dole from pefore	<pre>Source AND PURITY OF MATERIALS; 1. Research grade gas, purity 99.99 mole per cent minimum. 2. Sample of purity 99 mole per cent further purified by vacuum dist- illation. ESTIMATED ERROR:</pre>		

COMPONENTS:	
	ORIGINAL MEASUREMENTS:
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. Benzenamine (aniline); C<sub>6</sub>H<sub>7</sub>N; [62-53-3]</pre>	Stoica, T.; Bota, T. D.; Teusdea, G. M.; Sarbu, L.; Herscovici, J. Rev. Chim. (Bucharest)
[02 55 5]	<u>1981</u> 32, 1018-1019.
VARIABLES:	PREPARED BY:
Temperature	P. G. T. Fogg
EXPERIMENTAL VALUES:	
T/K Bunsen coefficient# β	Mole fraction*, $x_{\rm NH_3}$
298.2       33.34         323.2       17.29         343.2       10.04         260.2       4.60	0.1198 0.0672 0.0409
368.2 4.60 393.2 1.59	0.0196 0.0070
423.2 1.07	0.0049
* Calculated by the compiler using ref. 1. Values correspond to a (unspecified).	densities of benzenamine given in total pressure equal to barometric
Calculated by the compiler using ref. 1. Values correspond to a	densities of benzenamine given in total pressure equal to barometric
Calculated by the compiler using ref. 1. Values correspond to a (unspecified).	densities of benzenamine given in total pressure equal to barometric
Calculated by the compiler using ref. 1. Values correspond to a (unspecified).	total pressure equal to barometric
Calculated by the compiler using ref. 1. Values correspond to a (unspecified). AUXILIARY	total pressure equal to barometric

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COMPONENTS:		ORIGINAL	MEASUREMENTS:	
l. Ammonia; NH3; [7664- 2. Amines and quinoline	41-7]	Gogol Zh. F	tsov, A. I.; Panch eva, T. V. <i>iz. Khim.</i> <u>1968</u> , 42 <i>J. Phys. Chem.</i> <u>196</u> 1).	, 982-3
VARIABLES:		PREPAREI	) BY: P. G. T. Fog	1â
EXPERIMENTAL VALUES:		_ 1		
Solvent	т/к р <sub>N</sub>	H <sub>3</sub> /mmHg	Mole ratio <sup>mol</sup> NH <sub>3</sub> /mol <sub>solv</sub> .	Mole fraction* <sup>x</sup> NH <sub>3</sub>
Benzenamine (aniline); C <sub>6</sub> H <sub>7</sub> N; [62-53-3]	291.2	760	0.15	0.13
2-Aminoethanol; C <sub>2</sub> H <sub>7</sub> NO; [141-43-5]	290.2	760	0.23	0.19
	294.2	760	0.09	0.08
	291.2	760	0.06	0.06
was "satisfactorily" obey Calculated by the com		60 mmHg	= 1 atm = 1.013 × 1	.0 <sup>5</sup> Pa.
	AUXILIARY	INFORMAT	ION	
METHOD APPARATUS/PROCEDURE:	<u></u>	SOURCE A	ND PURITY OF MATERIALS	:
Conventional gas handling attached to a vacuum line A measured volume of solve admitted to the absorption which was fitted with a ma stirrer. Portions of amm measured volume and presse then admitted to the absorvessel and equilibrium pre- this vessel were measured mercury manometer. Allow made for the vapor pressur- solvent but the method of the allowance was not stat	was used. ent was n vessel agnetic monia at a are were option essures in by a vance was ce of the making	<ol> <li>Обтария</li> <li>Суй</li> <li>2. "Ри</li> <li>њатимати</li> <li>бт/к =</li> </ol>	tained from a comme linder. ure" grade. D ERROR: = $\pm 0.5$ ; $\delta p/mmHg =$ mated by the author 245:	±0.5

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Ammonia; NH<sub>3</sub>; [7664-41-7] 2. Hexanedinitrile (adiponitrile); C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>; [111-69-3]</pre>	Freidson, G. S.; Furmer, I. E.; Amelin, A. G. <u>1974</u> , VINITI deposited document 1543-74.
VARIABLES:	PREPARED BY:
Temperature, pressure	P. G. T. Fogg
m/r to 2	ne of gas, corrected 73.2 K and 760 mmHg, Mole blved by one volume fraction <sup>#</sup> of solvent.* <sup>x</sup> NH <sub>3</sub>
283.2 67 129 287 421 530 691 719	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
298.2 224 335 465 519 592 651 712	4.30.0217.60.03710.90.05215.40.07117.50.08019.80.09021.80.09824.20.108
	(cont.)
which was given by the authors. <sup>#</sup> Calculated by the compiler using the ref. 1. No allowance was made for	com a graph showing experimental points ne density of the solvent at 20°C given in or change of density with temperature.
METHOD APPARATUS/PROCEDURE: A quantity of ammonia, measured by changes in pressure of a known vol ume, was allowed into contact with a known volume of solvent in a thermostatted absorption vessel. The liquid in this vessel was nagnetically stirred and the final pressure of gas in contact with solution was measured (refs. 2-4). The authors gave the results in graphical form with volume of gas (corrected to 273.2 K and 1 atm)	- No information given.
absorbed by one volume of solvent plotted as a function of gas pres- sure. One graph corresponded to pressures below 1 atm. In this case experimental points lay close to straight lines. Henry's law constants, based on these measure- ments below 1 atm, were given by the authors. A second graph cor- responded to higher pressures. There was not a linear variation of corrected volume of gas absorbed with variation of pressure at these higher pressures.	<ul> <li>(63rd edition), C.R.C. Press, Cleveland, Ohio, 1982.</li> <li>2. Shenderei, E.R.; Zel'venskii, Ya. D.; Ivanovskii, F.P. Khim. Prom. 1960, 370.</li> <li>3. Braude, G. E.; Shakhova, S. F. Khim. Prom. 1961, 177.</li> </ul>

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	Ar	nmonia Solubilities	
OMPONENTS:		ORIGINAL MEASUREMENTS:	
	-	7] Freidson, G. S.; Fur rile); Amelin, A. G. <u>1974</u> , VINITI deposite 1543-74.	·
XPERIMENTAL VAL	UES:	Volume of gas, corrected to 273.2 K and 760 mmHg,	 
T/K	p <sub>NH3</sub> /mmHg	dissolved by one volume of solvent.*	Mole fraction <sup>#</sup> <sup>x</sup> NH <sub>3</sub>
313.2	113 202 329 401 506	2.7 4.6 7.2 9.1 11.5	0.013 0.022 0.035 0.043 0.054
328.2	674 715 156 300 422 495	15.5 16.3 2.5 4.4 6.3 7.6	0.072 0.075 0.012 0.021 0.030 0.037
343.2	588 690 714 153 241	8.6 10.5 10.8 1.9 3.0	0.041 0.050 0.051 0.009 0.015
	343 420 515 577 665 712	3.9 4.9 6.4 6.9 8.5 8.9	0.019 0.024 0.031 0.033 0.041 0.043
points which	, by the compil was given by t y the compiler.		rimental
	T/K	Henry's constant <sup>**</sup> /mmHg	
	283.2 298.2 313.2 328.2	4480 6720 9610 14080	
** Henry's cons	stant = $p_{\rm NH_3}/x_{\rm N}$	н <sub>з</sub> .	
pressures up to	b 1 atm and shown sures. The authors $K_{H}$ .	aw constant are based upon mea uld not be used for calculatin hors gave the following equation mHg) = 7.19 - (1008/T).	ng solubilitie
However, the co following equat	ompiler conside	rs that the values are better	fitted by the
TOTTOWING COMM			

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(cont.)

2. Hexanedi	NH₃; [7664-41-7 nitrile (adiponitr [111-69-3]		
		1543-74.	
EXPERIMENTAL V	ALUES:	Volume of gas, corrected	
T/K	$p_{\rm NH_3}^{\prime}/{\rm atm}$ *	to 273.2 K and 760 mmHg, dissolved by one volume of solvent.*	Mole fraction <sup>#</sup> <sup>%</sup> NH <sub>3</sub>
283.2	2.57 3.13 3.57	125 176 245	0.38 0.47 0.55
298.2	4.21 4.63 5.62 3.24 6.18 6.79 6.98 7.35	359 522 1152 101 359 429 502 587	0.64 0.72 0.85 0.34 0.64 0.68 0.71 0.75
313.2	8.00 8.39 2.16 4.58 5.88	891 1064 37 108 157	0.82 0.84 0.16 0.35 0.44
	7.13 7.46 7.78 8.26 9.06 10.37 11.54	230 243 274 305 370 629 1004	0.53 0.55 0.58 0.60 0.65 0.76 0.83
328.2	3.46 4.88 5.84 7.11 9.08 10.24 11.43 11.89 12.97 14.14 15.67	43 67 89 115 211 258 341 377 499 712 1173	0.18 0.25 0.31 0.36 0.51 0.56 0.63 0.65 0.71 0.78 0.85
* Values ta points wh	ken, by the compil ich was given by t	er, from a graph showing expe he authors.	erimental
<sup>#</sup> Calculate	d by the compiler.		
	760 mmHg =	$1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$	

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COMPONENTS:	EVALUATOR:
<pre>1. Methanamine (methylamine); CH<sub>5</sub>N;</pre>	P. G. T. Fogg,
[74-89-5]	School of Chemistry,
N-Methylmethanamine (dimethylamine);	Polytechnic of North London,
$C_{2}H_{7}N;$ [124-40-3]	Holloway,
N,N-Dimethylmethanamine (trimethyl- amine); C <sub>3</sub> H <sub>9</sub> N; [75-50-3]	London, U.K.
2. Organic liquids	August 1983

The solubility of amines in organic liquids has been reviewed and assessed by Gerrard (1) and by Counsell, Ellender and Hicks (2). In the case of many systems only one series of measurements has been carried out and therefore the reliability of the data must then be judged by testing whether a particular set fits into a general pattern shown for closely related systems.

#### Methanamine

Mole fraction solubilities of methanamine show a similar pattern to those of ammonia in that values are higher when the solvent contains oxygen or nitrogen as compared with values for hydrocarbons.

# Hydrocarbon solvents

Solubilities in hydrocarbons have been measured by Gerrard (1) and by Wolff  $et \ al$ . (3-6). Very detailed investigation of the systems with butane, hexane and nonane were made by Wolff and co-workers. The measurements on the system with butane (4) extended to temperatures above the boiling point of pure butane at 1 atm. Mole fraction solubilities at a partial pressure of 1 atm for these three hydrocarbons, calculated from measurements by Wolff  $et \ al$ ., show an appreciable decrease with increase in chain length at 273 K but insignificant change at 283 K and 293 K. However the mole fraction solubility in decane at 273 K and 1 atm partial pressure, as determined by Gerrard, is 0.413 compared with the value of 0.353 for nonane at this temperature and partial pressure, as determined by Wolff  $et \ al$ .

The solubility in benzene was measured by Gerrard (1) at 283 K and 1 atm partial pressure. The mole fraction solubility is about double that in n-alkanes under similar conditions but is smaller than the value corresponding to a reference line based upon the equation

 $x_1 = p_1 / p_1^0$ 

where  $p_1$  is the partial pressure of methanamine and  $p_1^O$  is the vapor pressure of liquified methanamine at the temperature of measurement. Measurements by Gerrard indicate that substitution of methyl groups into benzene lowers the mole fraction solubility of methanamine. Ammonia shows a similar pattern of solubility behaviour in benzene and substituted benzenes and there is no reason to doubt the values reported by Gerrard.

## Solvents containing oxygen

The solubilities of methanamine in numerous solvents containing oxygen have been reported by Gerrard (1) and may be accepted as tentative values. Mole fraction solubilities in alcohols are above the reference line values and higher than those in other solvents containing oxygen. Gerrard's measurements of the solubilities in 1,2-ethanediol and 1,2,3-propanetriol at 283 K indicate that mole fraction solubility increases with increase in the number of hydroxyl groups as is the case with ammonia. Measurements at 305 K and a partial pressure of methanamine of 1223 mmHg were made by Copley *et al.* (7) on 1,2-ethanediol, 2,2-oxybisethanol and 1,2,3-propanetriol . In this case the reported mole fraction solubility in 1,2-ethanediol is greater than that in 1,2,3-propanetriol but these values may be less reliable than the values reported by Gerrard because of the nature of the apparatus used.

COMPONENTS :	EVALUATOR:
<pre>1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. Organic liquids</pre>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. August 1983

Solvents containing oxygen (cont.)

Values published by Gerrard (1) of the mole fraction solubilities in 1,1'-oxybispentane, 1,1'-oxybisoctane, ethoxybenzene and 1,4-dioxane fall below reference line values, i.e. show positive deviations from Raoult's law, but are greater than values for hydrocarbons, as expected by analogy with ammonia. There is a marked variation in the mole fraction solubility in 1,1'-oxybisoctane with change in temperature. At a partial pressure of methanamine of 1 atm the mole fraction solubility is 0.604 at 273 K and 0.388 at 283 K. The mole fraction solubility at a partial pressure of methanamine of 1 atm in N,N-dimethylformamide, also reported by Gerrard, shows a similar marked variation so there is no reason to question the values.

# Solvents containing nitrogen

The solubilities of methanamine in a wide range of solvents containing nitrogen have been investigated by Gerrard (1). The methanamine and N, N-dimethylmethanamine system has also been studied by Wolff and Würtz (6) over the whole of the concentration range at temperatures from 223 K to 293 K. There are no obvious inconsistencies in any of these measurements which should be accepted as tentative.

Measurements by Gerrard on benzenamine and N-substituted benzenamines give an interesting series of mole fraction solubilities at 283 K with the values in the order: benzenamine > N-methyl- > N-ethyl- > N,N-dimethyl- > N,N-diethyl-. He also found that the mole fraction solubility in quinoline and pyridine at 283 K and a partial pressure of l atm were greater than the value of the solubility in benzene under the same conditions. This is to be expected since other workers (see ammonia evaluation p.3 ) have found that the mole fraction solubility of ammonia in quinoline is greater than that in benzene at 291 K.

#### Solvents containing halogens

The equilibrium between methanamine and tetrachloromethane at 253 K, 273 K, and 293 K and the full composition range has been investigated by Wolff and Würtz (4). The mole fraction solubility of methanamine at 283 K and a total pressure of 1 atm was measured by Gerrard (1). The evaluator has estimated that this value agrees to about 1% with a corresponding value interpolated from the measurements reported by Wolff and Würtz. Unlike ammonia, methanamine has greater mole fraction solubility in tetrachloromethane than in hydrocarbons, at the same temperature and partial pressure.

Gerrard also measured mole fraction solubilities in trichloromethane at 273 K and 283 K. Values are similar to ones reported by the same author for dissolution in long chain alcohols.

Gerrard (1) measured solubilities in benzene and bromobenzene and found that introduction of a bromine atom into the benzene nucleus increases the mole fraction solubility of methanamine at 283 K. Ammonia shows a similar behaviour in benzene and chlorobenzene but the reported mole fraction solubility of ammonia in bromobenzene (9) is slightly less than that in benzene (10). Gerrard also found that the mole fraction solubilities in 1-methyl-3-bromobenzene were lower than those in bromobenzene at 283 K but close to those in 1-bromo-naphthalene. Again ammonia shows analogous behaviour in benzene and toluene. (See ammonia evaluation p.10 .) There is therefore no reason to doubt Gerrard's measurements.

<pre>COMPONENTS: 1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. Organic liquids</pre>	EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. August 1983
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#### N-Methylmethanamine

N-Methylmethanamine has a higher boiling point than methanamine and has therefore the greater tendency to condense. Relative mole fraction solubilities in different organic solvents are similar for the two gases.

Hydrocarbon solvents

As is the case with ammonia and methanamine, the mole fraction solubility is lower in hydrocarbons than in alcohols.

The N-methylmethanamine and hexane system has been studied over the whole of the concentration range at temperatures from 223 K to 293 K by Wolff et al.(10,11). Gerrard (1) measured the mole fraction solubility in decane at various partial pressures and temperatures from 283 K to 298 K. The evaluator has calculated that Wolff's data indicate a mole fraction solubility of 0.473 at 293 K and a partial pressure of 1 atm when the solvent is hexane. This is close to the value of 0.501 given by Gerrard for the mole fraction solubility in decane under the same conditions of temperature and pressure.

Gerrard (1) has also measured the solubility in benzene and methyl benzenes. As expected by analogy with the behaviour of ammonia and methanamine, the mole fraction solubility is greater in benzene than in alkanes. However he did not observe the regular change in mole fraction solubilities of *N*-methylmethanamine with increase in number of methyl groups substituted into the benzene nucleus which he had observed for methanamine.

# Solvents containing oxygen

Mole fraction solubilities in methanol, ethanol and 1-propanol have been measured by Niepel *et al*. (12) and in 1-butanol and 1-octanol by Gerrard (1). Mole fraction solubilities tend to increase with increase in chain length but the solubility in methanol is greater than that in ethanol. Ammonia shows a similar pattern of behaviour with anomalous solubility in methanol and there is no reason to reject the values for *N*-methylmethanamine. Gerrard measured the mole fraction solubilities in 1,2-ethanediol and 1,2,3-propanetriol at 283 K. As with ammonia, increase in number of hydroxyl groups increases the mole fraction solubility. The solubility in 1,2,3-propanetriol was also measured by Copley *et al*. (7) but direct comparison with Gerrard's values is not possible because the temperature of measurement was 305 K.

Gerrard measured the mole fraction solubilities in three ethers and in dioxane at 293 K. As expected by analogy with ammonia and methanamine, solubilities are higher than in the two alkanes which have been studied but lower than in alcohols. Gerrard showed that the mole fraction solubility in ethoxybenzene is higher than the solubility in benzene. Methanamine behaves in a similar way in these two solvents so the measurements fall into a consistent pattern. Gerrard's measurements indicate that the mole fraction solubilities at 293 K in 1-phenylethanone and in ethyl benzoate are similar to solubilities in the ethers which were studied. However the mole fraction solubility in 1-phenyl benzoate is slightly less than the solubility in methylbenzene under the same conditions. This differs from the pattern reported for methanamine.

COMPONENTS:	EVALUATOR:
<pre>1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3]</pre>	P. G. T. Fogg, School of Chemistry
2. Organic liquids	August 1983

Solvents containing nitrogen

The solubilities of *N*-methylmethanamine in a wide range of organic solvents containing nitrogen have been measured by Gerrard (1). There is no reason to doubt their reliability as values appear to fall into a consistent pattern but there are no measurements by other workers for direct comparison. Measurements on benzenamine and *N*-substituted benzenamines lead to a series of mole fraction solubilities at 293 K and 1 atm which is similar to the order of solubilities of methanamine at 283 K. Values are in the order: benzenamine > *N*-methyl- > *N*-ethyl- > *N*,*N*-diethyl- > *N*,*N*-dimethyl-. The two last mentioned compounds are in the reverse order in the case of the solubilities of methanamine. As in the case of methanamine however, the mole fraction solubility in benzylamine is less than the solubility in benzenamine. The mole fraction solubility in pyridine was found to be higher than that in quinoline at 293 K. Gerrard found that methanamine behaved in the same way at 283 K.

# Solvents containing halogens

The N-methylmethanamine and tetrachloromethane system was studied by Wolff and Höppel (10) at 253 K to 293 K over the whole of the concentration range. Gerrard measured the mole fraction solubility of N-methylmethanamine in tetrachloromethane and in several other halogenated solvents at 293 K (1).

Gerrard reported that the mole fraction solubility in tetrachloromethane at a total pressure of 1 atm and 293 K was 0.596. The evaluator has estimated that this corresponds to a mole fraction solubility of 0.624 at a partial pressure of *N*-methylamine of 1 atm. This is close to the value of 0.604 which the evaluator has calculated from measurements reported by Wolff and Höppel. The mole fraction solubility in this solvent is higher than that in hydrocarbons but lower than that in alcohols under the same conditions. The behaviour of methanamine is similar.

Gerrard also found that the mole fraction solubility in trichloromethane was higher than that in tetrachloromethane at 293 K and a total pressure of 1 atm. This is again similar to the behaviour of methanamine at 283 K.

The mole fraction solubility of N-methymethanamine in chloro-, bromoand iodobenzene (1) was found to be higher than the solubility in benzene at 293 K at a total pressure of 1 atm just as the solubility of methanamine in chlorobenzene was found to be higher than that in benzene.

# N, N-Dimethylmethanamine

*N*,*N*-dimethylmethanamine has a boiling point, and hence a tendency to condense, in between that of methanamine and that of *N*-methylmethanamine. However replacement of all three hydrogen atoms in ammonia by methyl groups causes significant differences in behaviour from that of the primary or secondary amine.

## Hydrocarbon solvents

Solubilities in hydrocarbons have been measured by Gerrard (1), by Halban (13) and by Wheeler and Levy (14). Wolff and Würtz (5) have investigated the N, N-dimethylmethanamine and hexane system at 223 K to 293 K over the whole of the concentration range. The evaluator has calculated from data given by Wolff and Würtz that the mole fraction solubility in hexane is 0.024 at 298 K and a partial pressure of N, N-dimethylmethanamine of 42 mmHg. The value given by Halban for the mole fraction solubility under these conditions is 0.022. Although the Halban value is likely to be the less accurate it gives support to the work by Wolff and Würtz.

. Cont.

·			
COMPONENTS: 1. Methanamine (methylamine); CH <sub>5</sub> N;	EVALUATOR:		
[74-89-5]	P. G. T. Fogg,		
N-Methylmethanamine (dimethylamine);	School of Chemistry, Polytechnic of North London,		
C <sub>2</sub> H <sub>7</sub> N; [124-40-3] N,N-Dimethylmethanamine (trimethyl-	Holloway,		
amine); $C_3H_9N$ ; [75-50-3]	London, U.K.		
2. Organic liquids	August 1983		
CRITICAL EVALUATION:			
Hydrocarbon solvents (cont.)			
	hexane under the same conditions as by Wolff. This contrasts with the d of $N$ -methylmethanamine which have benzene than in alkanes at		
the corresponding mole fraction solut and that at 273 K and 140 mmHg is 0.1 values for hexane which the evaluator by Wolff and Würtz. At 233 K and 70 hexane is 0.653 and at 273 K and 140 study carried out by Wolff and Würtz range and, in the opinion of the eval carried out by Wheeler and Levy. In	tion of mole fraction solubility 70 mmHg. In the same way the Henry's 81 from a linear variation of mole 9. The evaluator has calculated that 9. The evaluator has calculated that 9. These may be compared with 9. The covers the whole of the concentration 1. The covers the whole of the concentration the the concentration the the covers the whole of the covers		
Gerrard (1) measured the mole fraction solubilities in decane at 283 K. The value which was reported for a pressure of 1 atm is 0.786. This value compares favourably with the value of 0.771 for mole fraction solubility in hexane under the same conditions, which the evaluator has calculated from data given by Wolff and Würtz.			
Solvents containing oxygen			
The solubility in a number of alcohols has been measured by Gerrard (1) at pressures to 1 atm and by Halban (13) at low pressures. There is no reason to question the general pattern of solubilities.			
Benzenemethanol is the only alcohol studied by both workers. For this solvent the evaluator has plotted Gerrard's values of mole fraction solubilities against pressure for 298 K and pressures from 100 mmHg to 760 mmHg. (Fig. 1) On the same graph he has plotted values calculated from data given by Halban for the same temperature but for pressures from 1 mmHg to 25 mmHg. All experimental points may be joined by a smooth curve passing through the origin indicating that there is no inconsistency between the two sets of measurements for this solvent. A linear extrapolation of Halban's solubility data to give solubilities for a pressure of 1 atm is clearly not justified in the case of this solvent and is likely to lead to errors in the case of other solvents studied by Halban. This has been discussed in more detail by Gerrard (1).			
Mole fraction solubilities in straight chain aliphatic alcohols show a small increase with increase in chain length, although Halban's measurements indicate that mole fraction solubilities in methanol are greater than those in ethanol at 298 K and pressures less than 10 mmHg. No measurements of solubilities in these two solvents have been made at higher pressures. The solubilities of ammonia, methanamine and <i>N</i> -methylmethanamine in alcohols show a similar pattern of behaviour.			
	Cont.		

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<pre>COMPONENTS: 1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3]</pre>	Holloway, London, U.K.
2. Organic liquids	August, 1983

Solvents containing oxygen (cont.)

Gerrard found that the mole fraction solubilities in 1,2-ethanediol and in 1,2,3-propanetriol at 283 K and 298 K were less than in the aliphatic monohydric alcohols which he had studied. This is in contrast to the behaviour of ammonia, methanamine and N-methylmethanamine. Gerrard attributed this difference to a greatly reduced tendency to form hydrogen bonds with the solvent when all the hydrogen atoms in ammonia are replaced by methyl groups.

He also found that the mole fraction solubilities in 2,2,2-trichloroethanol were greater than in other alcohols. This is similar to the behaviour found for ammonia, methanamine and N-methylmethanamine.

Gerrard (1) measured the mole fraction solubilities in three ethers. There is no reason to doubt the reliability of these measurements. Solubilities in ethoxybenzene were measured at 283 K and at pressures from 100 mmHg to 760 mmHg. Values are close to those obtained for methylbenzene at the same temperature. Solubilities in 1,1'-oxybisoctane were measured at 293 K and 298 K and pressures from 100 mmHg to 760 mmHg. Mole fraction solubilities are close to values for 1-octanol. Extrapolation of mole fraction solubilities to 283 K gives values which are close to those for decane indicating that the presence of the ether linkage may have little influence on the solubility.

Halban measured the solubility in 1,1'-oxybisethane at 298 K and pressures to 47 mmHg. Extrapolation of these values to 760 mmHg is unreliable because such systems deviate markedly from Henry's law and reliable comparison cannot be made with systems studied at higher pressures.

Gerrard (1) also measured the mole fraction solubility in 1,4-dioxane at 283 K and a total pressure of 1 atm.

The solubilities in ethyl benzoate were measured by Gerrard (1) at 293 K and 298 K and pressures from 100 mmHg to 760 mmHg. Halban (13) made measurements on this compound at 298 K and pressures of 38 mmHg and 39 mmHg. Extrapolation of Gerrard's mole fraction solubilities at 298 K to the pressures at which Halban worked leads to solubilities which are about 10% lower than Halban's values. Halban also measured solubilities in ethyl acetate at 298 K and pressures to 59 mmHg but again extrapolation of these measurements to 760 mmHg would be unreliable. Comparisons may be made, however, with solubilities in other solvents at low pressures which have been measured by Halban or found by extrapolation of Gerrard's data. (See below.)

Gerrard measured the solubility in 1-phenylethanone at 298 K and pressures from 100 mmHg to 760 mmHg. Extrapolation of these results to 40 mmHg give values which again differ by about 10% from mole fraction solubilities calculated from data given by Halban (see below). There is no reason to doubt, however, the general pattern of solubilities of N,N-dimethylmethanamine in solvents containing oxygen which has been presented by Gerrard.

Estimated mole fraction solubilities 298K; 40 mmHg

ethyl acetate	0.017				
ethyl benzoate	0.023	(Halban),	0.020	(Gerrard)	
1,1 <sup>^</sup> -bisoxyethane	0.012				
2-propanone	0.012				
1-phenylethanone	0.014	(Halban),	0.016	(Gerrard)	
					Cont.

<pre>COMPONENTS: 1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. Organic liquids</pre>	EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. August, 1983
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Solvents containing nitrogen

Gerrard (1) measured the solubilities in benzeneamine and several N-substituted benzeneamines. The measurements show that substitution of the first hydrogen atom has little effect on the mole fraction solubilities but substitution of the second hydrogen atom causes a decrease in solubilities. The solubility in 1-octamine was also reported to be close to that in benzeneamine. That in benzenemethanamine was reported to be less than those in benzeneamine. The mole fraction solubilities, at 283 K, in pyridine and in quinoline were less than in benzeneamine at the same pressure, with solubilities in pyridine greater than those in quinoline. Methanamine and N-methylmethanamine were reported to behave in a similar way in these two solvents. There is no reason to doubt the reliability of any of the solubility data for nitrogen bases reported by Gerrard.

Gerrard also measured mole fraction solubilities in nitrobenzene at 283 K and 298 K and in 1-methyl-2-nitrobenzene at 278 K to 298 K and pressures from 100 mmHg to 760 mmHg. There was little difference in solubilities in the two solvents when conditions were the same. Halban (13) also made measurements of solubilities in these two solvents at 298 K and lower pressures. Mole fraction solubilities from Halban's data, (H), are lower than values obtained by extrapolation of Gerrard's measurements (G).

i.e.

nitrobenzene;	63 mmHg;	$x_1 = 0.018$ (H), 0.020 (G)	
	82 mmHg;	$x_1 = 0.024$ (H), 0.026 (G)	
	94 mmHg;	$x_1 = 0.027$ (H), 0.030 (G)	
l-methyl-2-nitrobenzene;	87 mmHg;	$x_1 = 0.029$ (H), 0.035 (G)	
	85 mmHg;	$x_1 = 0.029$ (H), 0.034 (G)	

Halban also measured solubilities in nitromethane at 298 K and pressures to 56 mmHg. The mole fraction solubilities are low compared with values for aromatic nitro compounds.

Gerrard (1) measured the solubility in benzonitrile at 283 K and pressures from 100 mmHg to 760 mmHg. Mole fraction solubilities are less than reference values based upon the equation:

 $x_1 = p_1/p_1^\circ$ 

Halban measured solubilities in acetonitrile at 298 K and pressures to 47 mmHg. Mole fraction solubilities based upon these data are also less than the reference line values but the difference is even more marked than in the case of benzonitrile. This is in line with the observed difference between the behaviour of nitromethane and aromatic nitro compounds.

Solubilities in N, N-dimethylformamide at 278 K, 283 K and 298 K and pressures from 100 mmHg to 760 mmHg were measured by Gerrard (1). Solubilities were found to be very low in this solvent compared with the reference line and with other solvents which were studied. The solubilities in water are also low and, in both cases, there may be little tendency for the gas to break up the hydrogen bonded structure of the solvent. As mentioned above, a similar explanation has been put forward for the relatively low solubility in 1,2-ethanediol and in 1,2,3-propanetriol. The values reported for N,N-dimethylformamide are therefore in accord with those for other solvents and are likely to be reliable.

Cont.

COMPONENTS :	EVALUATOR:
<pre>1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. Organic liquids</pre>	Holloway

Solvents containing halogens

The N, N- dimethylmethanamine and tetrachloromethane system has been studied at 253 K, 273 K and 293 K over the whole of the concentration range. This work (5), and other studies of amine systems carried out by Wolff *et al.*, seems to the evaluator to be of very high standard. Solubilities in several other solvents containing halogens have been measured by Gerrard (1) and by Halban (13).

Gerrard found that the mole fraction solubility in trichloromethane at 298 K and a total pressure of 1 atm was 0.554. The evaluator has estimated that this corresponds to a mole fraction solubility of 0.62 at a partial pressure of N, N-dimethylmethanamine of 1 atm. This may be compared with the reference line or Raoult's law value of 0.464 and the value for tetrachloromethane, under the same conditions, of 0.52 which the evaluator has estimated by extrapolation of mole fraction solubilities calculated from data given by Wolff and Wurtz. A similar difference in solubilities of N-methylmethanamine in the two solvents has been reported and therefore these values for N, N-dimethylmethanamine fit into a general pattern of behaviour.

Halban also measured the solubility in trichloromethane at 298 K but at partial pressures from 5 mmHg to 9 mmHg. Direct comparison with Gerrard's value is not possible but solubilities measured by the two workers are not inconsistent with the marked curvature of plots of mole fraction solubilities against partial pressure of amine which has been observed for other solvents such as benzenemethanol. Gerrard measured solubilities in chlorobenzene, iodobenzene and 1-bromo-3-methylbenzene at 283 K and pressures from 100 mmHg to 760 mmHg. In all cases values were close to those given by the equation:

$$c_1 = p_1 / p_1^0$$

Gerrard also measured solubilities in 1-chloronaphthalene and in 1-bromonaphthalene at 298 K and pressures from 100 mmHg to 760 mmHg. Mole fraction solubilities were less than reference values based upon the above equation and there was little difference between values for the two solvents. Halban also measured solubilities in 1-bromonaphthalene at 298 K at pressures from 48 mmHg to 84 mmHg. Mole fraction solubilities calculated by the compiler from Halban's data, (H), are not consistent with mole fraction solubilities found by extrapolation of Gerrard's values to lower pressures, (G). i.e.

Mole fraction solubility in 1-bromonaphthalene at 298 K

48	mmHg	0.017	(H);	0.024	(G)
60	mmHg	0.020	(H);	0.030	(G)
84	mmHg	0.027	(H);	0.042	(G)

cont.

General pattern of the solubilities of ammonia, methanamine, N-methylmethanamine and N,N-dimethylmethanamine Mole fraction solubilities may be fitted to equations of the form:

 $-RT \ln x_1 = a + bT$ 

with a wide variation of values of a and b.

Approximate values of activity coefficients may be calculated from the relationship:

 $f_1 = p_1/(p_1^\circ x_1)$ 

where  $p_1^\circ$  is the vapor pressure of pure solute at temperature T and  $x_1$  is the mole fraction solubility at a partial pressure  $p_1$  and temperature T.

Systems fall into two groups:

- those in which values of f<sub>1</sub> decrease with increase in temperature;
- ii) those in which values of  $f_1$  increase with increase in temperature.

For the first group the value of  $x_1$ , as a percentage of the corresponding value of  $p_1/p_1^\circ$ , increases with increase in temperature. The reverse is true for the second group.

Increase in temperature will disrupt short range order associated with solvent-solvent interaction and this will favor dissolution of gas. Increase in temperature will also disrupt short range order associated with solvent-solute interaction and this will have the opposite effect on the solubility. The variation of activity coefficient with temperature is a measure of the variation of mole fraction solubility relative to the corresponding value of  $p_1/p_1^\circ$  and gives an indication of the comparative significance of the above two factors which lead to an increase in disorder in the liquid phase.

Heats of vaporization of ammonia, methanamine, N-methylmethanamine and N, N-dimethylmethanamine at 298 K may be estimated from the Clausius-Clapeyron equation, i.e.,

d ln  $p^{\circ}/dT = \Delta H^{\circ}/RT^{2}$ .

Values of  $\Delta H^{\,o}$  estimated by the evaluator from vapor pressure data are as follows:

$22420 \text{ J mol}^{-1}$
26070 J mol <sup>-1</sup>
27400 J mol <sup>-1</sup>
23970 J mol <sup>-1</sup> .

For systems in which  $(a + \Delta H^{\circ})$  is positive the value of the activity coefficient,  $f_1$ , decreases with increase in temperature (i.e.,  $x_1$  increases relative to  $p_1/p_1^{\circ}$ ). For systems in which  $(a + \Delta H^{\circ})$  is negative the reverse is true.

Values of a, b, and (a +  $\Delta H^{\circ}$ ) for a partial pressure of gas,  $p_1$ , of 1 atm are given in Table 2. The corresponding smoothing equations are valid only for the ranges of temperature of the experimental measurements. In some cases values of a and b are based upon data for only two temperatures. These are included so as to indicate the general pattern of values.

The solubilities of ammonia in hexadecane, bicyclohexyl and 1-methylnaphthalene were measured by Tremper and Prausnitz (17) over a wide temperature range. Mole fraction solubilities for 1 atm partial pressure, based upon these data, fall on smooth curves when plotted against temperature. However, the smoothing equation with two constants, a and b, is not fully adequate for the whole temperature range. The values of a and b for these systems, given in the table and corresponding to the best fit of data with the smoothing equation used, are for qualitative comparison with values for other systems. They should not be used for precise calculation of values of solubilities. Systems in which a monohydric or polyhydric alcohol is the solvent have positive values for  $(a + \Delta H^{\circ})$  with the exception of N,N-dimethylmethanamine in 1,2-ethanediol which has a small negative value. For most of these systems the ratio of mole fraction solubility to the value of  $(p_1/p_1^{\circ})$ increases with increase of temperature. Compared with other solvents, alcohols show smaller variation of  $(a + \Delta H^{\circ})$  with increase in number of methyl groups in the gas. These observations are in accord with the hypothesis that the breaking of hydrogen bonds between alcohol molecules with increase in temperature is a factor favoring the solubility of these gases.

The values of  $(a + \Delta H^{\circ})$  for methanamine and methylmethanamine from measurements by Gerrard (1), fall into the pattern for these gases in hexane and nonane from the more detailed measurements by Wolff *et al.* (3,4). In general, the values of  $(a + \Delta H^{\circ})$  which are available for solubilities in the straight chain alkanes, butane, hexane, nonane and decane are negative, in contrast with values for alcohols. Solubilities of all four gases have been measured in hexane and there is very marked variation of values of  $(a + \Delta H^{\circ})$  with change of gas, again in contrast with alcohol systems. The ammonia-hexadecane system appears to be anomalous when compared with systems in lower alkanes because  $(a + \Delta H^{\circ})$  is positive. However the ammonia-bicyclohexyl system also has a positive value of  $(a + \Delta H^{\circ})$ .

The variation of the mole fraction solubilities of the three amines with variation of temperature has been measured in N,N-dimethylformamide and in tetrachloromethane. In the first case values of  $(a + \Delta H^{\circ})$  become increasingly negative with number of methyl groups in the amine suggesting a corresponding increase in the tendency for hydrogen bonding between amine and solvent. In the case of the second solvent the value of  $(a + \Delta H^{\circ})$  is negative for methanamine but is increasingly positive from N-methylmethanamine to N,N-dimethylmethanamine, suggesting a corresponding decrease in the interaction between solute and solvent.

There are insufficient measurements of the solubilities of the gases in other solvents to justify generalisations about the effect of temperature or to pick out apparently anomalous behaviour.

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Amine Solubilities: Critical Evaluation

	· · · · · · · · · · · · · · · · · · ·	
re of gas of 1 atm, <sup>2</sup> (a + ΔH°)/J mol <sup>-1</sup> -26250 -13990 - 7460 - 6250 17450	CRITICAL EVALUATION:	<pre>COMPONENTS: 1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5] N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanamine (trimethyl- amine); C<sub>3</sub>H<sub>5</sub>N; [75-50-3] 2. Organic liquids</pre>
13880 13940 16180 - 2400 2100 8110 8330 - 6660 -12430 - 180 - 8080		EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, U.K. August 1983

Values of the constants a and b in the smoothing equation for solubilities at a partial protogether with values of (a +  $\Delta H^{\circ}$ ). Table 2.

 $(a + \Delta H^{\circ})/J \mod^{-1}$ 

-39440

NH<sub>3</sub>

 $b/J mol^{-1} K^{-1}$ 

242.6

.

a/J mol<sup>-1</sup>

-61860

Solvent

Butane

Hexane

ressure	of	gas	of	1	atm,	

CH<sub>3</sub>NH<sub>2</sub>

. .

 $b/J mol^{-1} K^{-1}$ 

197.5

154.8

 $a/J mol^{-1}$ 

-52320

-40060

Hexane	-01000	242.0	-39440	-40060	154.8	-13990
Nonane				-33530	131.4	- 7460
Decane				-32320	125.6	- 6250
Hexadecane	- 6911	55.3	15509			
Bicyclohexyl	- 6317	61.6	16103			
Cyclohexene	-17010	92.9	5410			
Benzene	-17360	86.4	5060	1		
1,3-Dimethylbenzene						
1-Methylnaphthalene	-10360	64.2	12060	4		
Methanol	-11570	48.7	10850			
Ethanol	-13720	57.7	8700	1	•	
2,2,2-Trichloroethanol				- 8620	33.0	17450
1-Propanol	-15370	63.8	7050			
2-Propanol	-14710	62.3	7710			
1-Butanol				-12190	46.5	13880
1-Octanol	<u> </u>			-12130	46.2	13940
Benzenemethanol				- 9890	37.9	16180
1,2-Ethanediol						
1.2.3-Propanetriol				ł		
1,1'-Oxybisoctane				-28470	108.4	- 2400
2,2'-Oxybisethanol	-18850	70 <b>.</b> 9 <sup>'</sup>	3570			2100
Ethyl benzoate	10050			-23970	90.6	2100
Hvdrazine	-21690	94.1	730			2200
Methylhydrazine	-21820	92.3	600		······································	
1,1-Dimethylhydrazine	-18210	80.3	4210			
1-Octanamine	10210		4210		· · · · · · · · · · · · · · · · · · ·	
Benzenamine	-25180	101.1	- 2760			
N-Methylbenzenamine			2700	-17960	67.7	8110
N-Ethylbenzenamine				-17740	67.0	8330
N,N-Dimethylbenzenamine				-32730	123.1	- 6660
N,N-Diethylbenzenamine	l			-38500	144.4	-12430
Benzenmethanamine					<del></del>	12450
Benzonitrile		•				
Nitrobenzene				_ <del></del>		
1-Methyl-2-nitrobenzene						
N,N-Dimethylformamide				-26250	98.5	- 180
Tetrachloromethane				-34150	127.7	- 8080
Tetrachioromethane	L	· · · · · · · · · · · · · · · · · · ·				- 8080

	(CH <sub>3</sub> ) 2NH				(CH <sub>3</sub> ) <sub>3</sub> N			Methanamu [74-89-5 N-Methylm C <sub>2</sub> H,N; C <sub>2</sub> H,N; amine); Organic 1
Solvent	a/J mol <sup>-1</sup>	$(CH_3)_{2N}$ b/J mol <sup>-1</sup> K <sup>-1</sup>	$(a + \Delta H^{\circ})/J \text{ mol}^{-1}$	a/J mol <sup>-1</sup>	(CH <sub>3</sub> ) <sub>3</sub> b/J mol <sup>-1</sup> K <sup>-1</sup>	$(a + \Delta H^{\circ})/J \text{ mol}^{-1}$	EVALUATION:	<pre>1. Methanamine (methyia [74-89-5] N-Methylmethanamine C<sub>2</sub>H<sub>7</sub>N; [124-40-3] N,N-Dimethylmethanan amine); C<sub>3</sub>H<sub>9</sub>N; [7 2. Organic liquids</pre>
Butane	-41420	147.5	-14020	-25230	91.2	- 1260		(metnyiamine hanamine (dim 4-40-3] methanamine H <sub>9</sub> N; [75-50 ids
Ionane							-	
ecane	-36320	129.6	- 8920					5 PL (2 PL
lexadecane							ור	
icyclohexyl								
yclohexane enzene								(dimethylamine); nine (trimethyl- '5-50-3]
,3-Dimethylbenzene	-29290	104.6	- 1890	+			-	
-Methylnaphthalene	-25250	104.0	- 1000					lamin meth
ethanol	-13610	49.6	13790		······		-	
thanol	-15830	57.3	11570				1	2 5 5 5
,2,2-Trichloroethanol	-11470	41.4	15930	-12090	44.2	11880		y ne
-Propanol	-15080	54.5	12320	12050	11.2	1*000		
Propanol			12520				-1	<u></u>
L-Butanol				-16420	60.7	7550		
-Octanol	-15040	54.0	12360	-16940	61.5	7030	-	
Benzenemethanol	-14910	53.8	12490	-18670	67.9	5300		6 0000
,2-Ethanediol				-24750	90.7	- 780	-	P. G. School Polytee Hollowa London August
,2,3-Propanetriol				-22300	82.2	1670		1 2 2040
,1'-Oxybisoctane	<u> </u>			-15320	56.1	8650	-1	H D S O H
2.2'-Oxybisethanol								1 L
thyl benzoate	{		ė	-26050	94.5	- 2080	-1	of C of C hnic AY, U.K 1983
Ivdrazine								
ethylhydrazine							-1	
,1-Dimethylhydrazine								l of d
-Octanamine	-24140	86.2	3260	-21020	76.2	2950	1	1
Senzenamine	}						1	No st
-Methylbenzenamine							7	H H
V-Ethylbenzenamine				\			}	L C
N-Dimethylbenzenamine	-31410	112.3	- 4010	1			7	P. G. T. Fogg, School of Chemistry, Polytechnic of North 1 Holloway, London, U.K. August 1983
N-Diethylbenzenamine							1	
enzenmethanamine	-23480	84.6	3920				٦	1 2
enzonitrile	-26700	95.7	700	1				ů,
itrobenzene				-35370	127.9	-11400	7	London
-Methyl-2-nitrobenzene				-35210	127.4	-11240		1 5
N,N-Dimethylformamide	-34560	123.3	- 7160	-51100	185.3	-27130	]	
Tetrachloromethane	-26840	95.7	560	-19830	71.9	4140	1	1

Amine Solubilities: Critical Evaluation

52		weundnamm						
COMPONENTS:			ORIGINAL MEASUREMENTS:					
[74-1	amine, (methy] 89-5] ; C <sub>4</sub> H <sub>10</sub> ; [106-	.amine); CH <sub>5</sub> N; -97-8]	Wolff, A.; Höpfner, A.; Höpfner,HM. Ber. Bunsenges. Phys. Chem. <u>1964</u> , 68, 410-417.					
				·····				
VARIABLES:			PREPARED BY:					
Comj	position, temp	perature	P. G. T. Fogg					
EXPERIMENTAL								
Variation of the total vapor pressure/Torr with variation of temperature and of mole fraction of $CH_5^N$ in the liquid phase, $x_{CH_5^N}$								
			т/к		5			
<sup>x</sup> сн <sub>5</sub> n	218.15	233.15	253.15	273.15	288.15			
0 0.0043 0.0086 0.0334 0.1089 0.134 0.208 0.257 0.314 0.365 0.454 0.517 0.532 0.577 0.602 0.654 0.731 0.738 0.774	52.0 55.2 58.5 68.1 82.3 83.7 85.3 86.2 86.6 86.2 86.6 86.8 86.5 86.6 86.3 86.2 86.3 86.2 85.3 85.4 84.9	125.2 131.1 136.8 160.3 196.0 200.5 207.9 211.4 212.0 212.9 213.9 214.1 213.6 214.1 213.4 212.9 214.1 213.4 212.9 211.4 210.3 209.6	339.5 349.8 362.3 417.8 513.2 530.3 560.9 575.6 580.7 586.4 590.8 595.7 592.4 592.2 591.0 589.5 585.6 583.6 583.6 579.3	775.9 793.3 814.7 914.8 1123.1 1167.9 1257.5 1305.5 1324.4 1362.4 1369.5 1372.1 1372.0 1370.3 1361.7 1356.7 1347.2 Cont.	1319.4 1348.6 1380.5 1523.8 1860.3 1934.3 2105.1 2203.1 2225.1 2283.9 2329.1 2349.1 2352.9 2359.7 2362.4 2361.2 2344.0 2343.0 2325.6			
		AUXILIARY	INFORMATION					
METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressures were measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported.			<pre>SOURCE AND PURITY OF MATERIALS: 1. From commercial reinst methyl-    ammonium chloride by reaction with    KOH; gas dried with KOH and Li;    liquified gas treated with Li and    repeatedly fractionated until first    and last fractions had vapor    pressures between 2191 and 2193    Torr at 20<sup>o</sup>C. 2. Commercial product; dried with P<sub>2</sub>O<sub>5</sub>    repeatedly fractionated until first    and last fractions had the same    vapor pressures measured by the    manometer as described for ESTIMATED ERROR: Hexane (1).</pre>					
			<i>chem</i> . <u>196</u> 2. Barker, 5 6, 207. 3. Redlich,	; Höpfner, A. 2, 66, 149. 7.A. Aust. J. C. 0.; Kister, A. 8, 21, 345.	hem. <u>1953</u> ,			

COMPONENTS:			ORIGINAL MEASUREMENTS:			
<pre>1. Methanamine, (methylamine); CH<sub>5</sub>N; [74-89-5]</pre>			Ber. Bunsen	Höpfner, A.; Hö ges. Phys. Chem		
2. Butane; C <sub>4</sub> H <sub>10</sub> ; [106-97-8]			<u>1964</u> , 68, 410-417.			
VARIABLES:	<u></u>	<u></u>	PREPARED BY:	<u></u>	·····	
Com	position, temp	perature	P	P. G. T. Fogg		
EXPERIMENTAL	VALUES: Cont	:.	J		<u> </u>	
			T/K			
<sup>ж</sup> сн <sub>5</sub> N	218.15	233.15	253.15	273.15	288.15	
0.847 0.938 0.957	82.5 70.6 67.1 45.8	202.4 177.4 169.3 126.3	561.2 500.8 482.2 394.2	1308.6 1198.0 1158.3 1001.8	2269.0 2102.3 2042.7 1826.3	
	T/K	A A	B B	C		
	from the	2.261	r equations g	iven below		
	223.15228.15233.15243.15253.15263.15	2.213 2.143 2.095 1.976 1.857 1.741	$ \begin{array}{c} -0.030 \\ -0.017 \\ -0.008 \\ +0.008 \\ +0.032 \\ 0.066 \end{array} $	0.381 0.371 0.353 0.313 0.259	-	
	203.15 273.15 283.15 288.15	1.741 1.623 1.517 1.461	+0.066 +0.079 +0.087 +0.095	0.214 0.189 0.157 0.150		
-		-		$\begin{array}{c} -8 \ x_1 + 12 \ x_1 \\ -8 \ x_2 + 12 \ x_2 \end{array}$		
where	$f_1 = activ$ $f_2 = activ$ $x_1 = mole$ $x_2 = mole$	ity coefficien ity coefficien fraction of me fraction of but	t of methylami t of butane thylamine in t tane in the li	ine the liquid phas quid phase	e	
	$x_1 = \text{mole}$ $x_2 = \text{mole}$	fraction of me fraction of bu	thylamine in t tane in the li	che liquid phas .quid phase	e	

COMPONENTS:	ORIGINAL MEASUREMENTS:			
<pre>1. Methanamine, (methylamine); CH<sub>5</sub>N; [74-89-5] 2. Hexane, C<sub>6</sub>H<sub>14</sub>; [110-54-3]</pre>	Wolff, H.; Höpfner, A. Z. Elektrochem. <u>1962</u> , 66, 149-159.			
614				
VARIABLES:	PREPARED BY:			
Composition, temperature	P. G. T. Fogg			
EXPERIMENTAL VALUES:				
Variation of the total vapor pressure, and of mole fraction of $CH_5N$ in	/Torr with variation of temperature the liquid phase, ${x_{\mathrm{CH_{c}N}}}$			
	т/к			
<sup><i>x</i></sup> CH <sub>5</sub> N 218.15 223.15 228.15 233.15 24	3.15 253.15 263.15 273.15 283.15 293.15			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	0.8       32.9       51.4       78.7       118.5       174.9         6.0       54.7       80.9       118.4       169.6       239.5         5.9       83.1       120.3       171.2       238.5       327.6         5.4       112.8       162.4       228.5       314.3       424.6         0.1       150.7       217.3       305.9       417.7       560.3         9.9       181.4       264.3       371.0       506.2       672.6         7.5       228.7       338.1       482.3       663.5       887.5			
AUXILIARY	INFORMATION			
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:			
Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressures were measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported. The compositions of the vapor phase were also calculated by the authors.	<ol> <li>From commercial reinst methyl- ammonium chloride by reaction with KOH; gas dried with KOH and Na; liquified gas treated with Li and repeatedly fractionated until first and last fractions had vapor pressures between 2191 and 2193 Torr at 20°C.</li> <li>Commercial product; dried over P<sub>2</sub>O5 distilled and repeatedly fraction- ated until first and last fractions had the same vapor pressures as measured by the manometer.</li> <li>ESTIMATED ERROR: δT/K = ± 0.02 (estimated by authors)</li> </ol>			
	<ul> <li>REFERENCES:</li> <li>1. Wolff, A.; Höpfner, A.; Höpfner, HM. Ber. Bunsenges. Phys. Chem. <u>1964</u>, 68, 410.</li> <li>2. Barker, J.A. Aust. J. Chem. <u>1953</u>, 6, 207.</li> <li>3. Redlich, O.; Kister, A.T. Ind. Eng. Chem. <u>1948</u>, 21, 345.</li> </ul>			

Methanamine Solubilities

Methanamine Solubilities

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Methanamin	e Solubilities g
COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>Methanamine, (methylamine); CH<sub>5</sub>N; [74-89-5]</li> <li>Hexane, C<sub>6</sub>H<sub>14</sub>; [110-54-3]</li> </ol>	Wolff, H; Höpfner, A. <i>Z. Elektrochem.</i> <u>1952</u> , 66, 149-159.
VARIABLES:	PREPARED BY:
Composition, temperature	P. G. T. Fogg
EXPERIMENTAL VALUES: Cont.	
	т/к
<sup>x</sup> CH <sub>5</sub> N 218.15 223.15 228.15 233.15 243	3.15 253.15 263.15 273.15 283.15 293.1
0.877 44.3 63.2 88.7 121.6 219 0.925 44.6 63.6 89.1 122.6 222 0.969 44.9+ 64.9 90.8 125.3 227	1       369.1       597.0       929.0       1392.6       2017.1         .9       375.3       607.6       948.8       1422.4       2062.2         1       380.1       617.5       964.4       1448.3       2104.2         .4       389.0       631.5       985.9       1483.7       2152.6         .8       394.2       640.5       1001.8       1506.6       2191.2
*by extrapolation <sup>‡</sup> corrected value of 45.8 given Constants* for calculation from the Redlich-Kister	of activity coefficients
T/K A	B C
218.152.392223.152.338228.152.266233.152.213243.152.087253.151.956263.151.833273.151.709283.151.588293.151.470	0.1220.5270.1300.4720.1380.3950.1500.3840.1630.3000.1800.2500.1980.2120.2140.1850.2240.1640.2310.148
$\ln f_{1} = A x_{2}^{2} - B x_{2}^{2} (1 - 4 x_{1})$ $\ln f_{2} = A x_{1}^{2} + B x_{1}^{2} (1 - 4 x_{2})$	
where $f_1$ = activity coefficient $f_2$ = activity coefficient $x_1$ = mole fraction of meth $x_2^1$ = mole fraction of hexa * revised values given by the auth	

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Methanamine Solubilities

COMPONENTS:	ORIGINAL M	ORIGINAL MEASUREMENTS:			
<ol> <li>Methanamine, (m [74-89-5]</li> <li>Nonane; C<sub>9</sub>H<sub>20</sub>;</li> </ol>	Ber. B	Wolff, H.; Höpfner, A.; Höpfner,HM Ber. Bunsenges. Phys. Chem. <u>1964</u> , 68, 410-417.			
VARIABLES:		PREPARED E	SY:		
Composition,	temperature		P. G. T. Fogg		
EXPERIMENTAL VALUES:					
Variation of the t and of mo	otal vapor pressu le fraction of CH	5 <sup>N</sup> in the	liquid phase, <sup>x</sup> CH	emperature 5 <sup>N</sup>	
		Ţ.	/К		
<sup>x</sup> CH <sub>5</sub> N 2	33.15 2	53.15	273.15	293.15	
0.0083         0.0165         0.0245         0.0324         0.0403         0.0452         0.0862         0.1278         0.188         0.251         1.0311         0.381         0.440         0.533         1.588	10.2         19.3         27.6         35.1         41.9         45.7         72.2         16         203.1         21.3         22.12         33         21.2         32         21.4	0.2 20.6 39.5 56.8 73.7 89.1 97.0 62.2 12.5 63.2 97.9 19.7 37.1 47.0 57.1 61.5 56.3	0.9 37.0 71.3 103.4 134.0 163.3 176.0 308.0 420.0 546.9 644.4 714.2 774.3 809.9 853.4 872.4 899.5 Cont.	3.4 61.5 116.7 169.8 221.2 270.8 286.3 515.1 725.1 977.5 1193.2 1359.2 1518.4 1613.1 1745.7 1807.1 1898.2	
	AUXILIAR	Y INFORMATIO	N		
METHOD / APPARATUS / PROCED	URE :	SOURCE AN	D PURITY OF MATERIALS	:	
Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressures were measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported.		ractions had the same vapor pressures as measured by the tSTIMATED ERROR: manometer (1).		t methyl- reaction with DH and Na; with Li and ed until ons had vapor l and 2193 ried over epeatedly rst and last e vapor by the er (1).	
		<i>chem</i> 2. Barke 6, 20 3. Red1:	f, H.; Höpfner, A. . <u>1962</u> , 66, 149. er, J.A. Aust. J.	Chem. <u>1953</u> ,	

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			57	
	ORIGINAL ME	ORIGINAL MEASUREMENTS:		
<pre>l. Methanamine, (methylamine); CH<sub>5</sub>N; [74-89-5]</pre>		Wolff, H.; Höpfner, A.; Höpfner, HM		
	1	-	<i>m</i> .	
9 <sup>H</sup> 20 <sup>;</sup> [111-84-2]	<u>1964</u> , 68	3, 410-417.		
<u></u>	PREPARED BY	:		
ition, temperature		P. G. T. Fogg		
UES: Cont.				
	T/K			
233.15	253.15	273.15	293.15	
		0,0115	222.13	
122.4 3	368.9	909.1	1932.4	
122.2 3		915.7	1954.2	
123.4 3	383.6	974.4	2100.7 2129.8	
126.3 3	394.2	1001.8	2191.7	
233.152.323243.152.174253.152.024263.151.881273.151.738283.151.597293.151.463	0.362 0.379 0.392 0.399 0.401	0.336 0.286 0.255 0.229 0.214		
			-	
T T	-	_ <b>_</b>	4	
	5] $g^{H}_{20}$ ; [111-84-2] ition, temperature .UES: Cont. 233.15 122.4 122.2 122.3 123.4 126.3 760 Torr = 1 atm = onstants for calculatic from the Redlich-Kist T/K A 233.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 2.323 243.15 1.738 283.15 1.738 283.15 1.738 293.15 1.463 A $x_2^2$ - B $x_2^2(1 - 4)$	ne, (methylamine); CH <sub>5</sub> N; $g_{120}$ ; [111-84-2] $g_{120}$ ; [111-84-2] $g_{120}$ ; [111-84-2] $g_{120}$ ; [111-84-2] $g_{120}$ ; [111-84-2] $g_{120}$ ; [111-84-2] $g_{120}$ $g_{120}$ ; [111-84-2] $g_{120}$ $g_{120}$ ; [111-84-2] $g_{120}$ $g_{120}$ ; [111-84-2] $g_{120}$ $g_{120}$ ; [111-84-2] $g_{120}$ $g_{1$	ne, (methylamine); $CH_5N$ ; 51 $9^{H}_{20}$ ; [111-84-2] PREPARED BY: ition, temperature PREPARED BY: 1964, 68, 410-417. 1964, 68, 410-417. 1964, 68, 410-417. PREPARED BY: P. G. T. Fogg 122.4 368.9 909.1 122.2 369.3 915.7 122.3 379.2 958.7 123.4 383.6 974.4 126.3 94.2 1001.8 760 Torr = 1 atm = 1.013 x 105 Pa 760 Torr = 1 atm = 1.013 x 105 Pa T/K A B C 233.15 2.323 0.338 0.393 243.15 2.323 0.338 0.393 243.15 2.323 0.338 0.393 243.15 2.174 0.362 0.336 253.15 1.281 0.392 0.286 263.15 1.881 0.392 0.286 263.15 1.597 0.401 0.214	

COMPONENTS :			ORIGINAL MEASUREMENTS:		
	mine, (meth) [74-89-5]	ylamine);	Gerrard, W.		
2. Decane; $C_{10}H_{22}$ ; [124-18-5]			Solubility of Gases and Liquids,		
	10 22		<i>Plenum</i> , <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
Tem	perature, p	ressure	C. L. Young		
EXPERIMENTAL	VALUES:				
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid,		
1/1	r/mung	F/10 Pa	<sup><i>w</i></sup> CH <sub>3</sub> NH <sub>2</sub>		
273.15	100	0.133	0.028		
	200	0.267	0.061		
1	300 400	0.400 0.533	0.097 0.141		
	500	0.667	0.193		
	600	0.800	0.262		
	700	0.933	0.350		
278.15	760	1.013	0.413		
2/0.10	100 200	0.133 0.267	0.022 0.047		
	300	0.400	0.075		
	400	0.533	0.109		
	500	0.667	0.144		
	600 700	0.800 0.933	0.190 0.256		
	760	1.013	0.318		
283.15	100	0.133	0.020		
	200	0.267	0.044		
	300 400	0.400 0.533	0.070 0.100		
	500	0.667	0.132		
	600	0.800	0.168		
	700	0.933	0.206		
	760	1.013	0.253		
			INFORMATION		
	ATUS/PROCEDURE		SOURCE AND PURITY OF MATERIALS:		
pf pure li	quid in a bu	a known weight ubbler tube at a	l. British Drug Houses or Cambrian Gases sample.		
assembly.	The amount	ed by a manometer of absorbed	2. Purified and attested by		
gas was es	timated by w	weighing. The	conventional procedures.		
temperatur	e was manual	Lly controlled	_		
to within	0.2K. tus and prod	roduro aro			
described	by Gerrard	[1,2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			l. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976.		
			Chapter 1.		

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Methanamine (methylamine); CH<sub>5</sub>N; [74-89-5]</pre>	Gerrard, W. Solubility of Gases and Liquids
2. Decane; C10H22; [124-18-5]	Plenum, <u>1976</u> , Chapter 10.

EXPERIMENTAL VALUES:

T/K	P/mmHg	<i>P/</i> 10⁵ Pa	Mole fraction of methylamine in liquid, CH3NH2
293.15	100	0.133	0.011
	200	0.267	0.023
	300	0.400	0.037
	400	0.533	0.055
	500	0.667	0.078
	600	0.800	0.103
	700	0.933	0.134
	760	1.013	0.156

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Methanamine Solubilities

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Methanamine; (methylamine)	; Gerrard, W.
$CH_5N; [74-89-5]$	Solubility of Gases and Liquids,
2. Aromatic hydrocarbons	Plenum, 1976, Chapter 10.
VARIABLES:	PREPARED BY:
Pressure	C. L. Young
EXPERIMENTAL VALUES:	Mole fraction of methylamine
T/K P/mmHg P/10	<sup>5</sup> Pa in liquid,
	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
Benze 283.15 760 1.0	
	(toluene); C <sub>7</sub> H <sub>8</sub> ; [108-88-3]
283.15 760 1.0	
	(m-xylene); C <sub>8</sub> H <sub>10</sub> ; [108-38-3]
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
300 0.4	00 0.100
400 0.5	
500 0.6 600 0.8	
700 0.9	
760 1.0	
1,3,5-Trimethylbenze	ne (mesitylene); C <sub>9</sub> H <sub>12</sub> ; [108-67-8]
283.15 100 0.1	
200 0.2 300 0.4	
400 0.5	
500 0.6	
600 0.8 700 0.9	
760 1.0	
	AUXILIARY INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Amine was passed into a known	
of pure liquid in a bubbler tu total pressure measured by a m	anometer
assembly. The amount of absor gas was estimated by weighing.	bed 2. Purified and attested by
temperature was manually contr	The conventional procedures.
to within 0.2K.	
The apparatus and procedure ar	e
described by Gerrard [1,2].	
	ESTIMATED ERROR:
	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
	(estimated by compiler)
	REFERENCES:
	l. Gerrard, W. J. Appl. Chem. Biotechnol. 1972, 22
	623-650.
	2. Gerrard, W.
	Solubility of Gases and Liquids. Plenum Press, New York. 1976.
	Chapter 1.

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[74- 2. 1,2-Eth	89-5]	lamine); CH5N; nylene glycol); 1-1]	ORIGINAL MEASUREMENTS: Gerrard, W. Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
Press	ure		C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>	
283.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.375 0.476 0.537 0.583 0.623 0.660 0.691 0.709	
		AUXILIARY	INFORMATION	
METHOD APPAR	ATUS /PROCEDURE	•	COURCE AND DUDITY OF MATERIALS.	
METHOD/APPARATUS/PROCEDURE: Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambria Gases sample. 2. Purified and attested by conventional procedures.	n
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	2

COMPONENTS:				
	ORIGINAL	MEASUREMENTS:		
<pre>1. Methanamine (Methylamine); CH<sub>5</sub>N; [74-89-5]</pre>		Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S.		
2. Glycols and glycerol		ner. Chem. Soc.		
	<u>1941</u> ,	63, 254-256.		
VARIABLES:	PREPARED	BY:		
		P. G. T.	Fogg	
EXPERIMENTAL VALUES:				
Solvent	т/к	<sup>₽</sup> CH <sub>5</sub> N <sup>/mmHg*</sup>	Mole fraction <sup>#</sup> CH <sub>5</sub> N	
l,2-Ethanediol, (Ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	305.4	1223	0.662	
2,2'-Oxybis-ethanol, (Diethylene glycol); C <sub>4</sub> H <sub>10</sub> O <sub>3</sub> ; [111-46-6]	305.4	1223	0.653	
l,2,3-Propanetriol, (Glycerol); C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> ; [56-81-5]	305.4	1223	0.653	
* The pressure of methylamine was sai its vapor pressure at 4.5°C. The m estimated by the compiler from vapo	agnitud	e authors to c	orrespond to	
	r press	le of this pres	sure has been	
AUXILIARY		le of this pres ure data given	sure has been	
······································	INFORMAT	le of this pres ure data given	sure has been in ref. (1).	
	INFORMAT SOURCE The a mater caref	le of this pres sure data given ION AND PURITY OF MATH withors stated tials used were fully by chemic tional distilla	Sure has been in ref. (1). CRIALS: that the all purified cal means and	

COMPONENTS :			ORIGINAL MEASUREMENTS:		
l. Metha	namine (Methyl	.amine); CH <sub>5</sub> N;	Gerrard, W.		
[74	-89-5]		Solubility of Gases and Liquids,		
2. 1,2,3	-Propanetriol	(Glycerol);	Plenum 1976, Chapter 10.		
C ₃ H	803; [56-81-5	5]	<u> </u>		
VARIABLES:			PREPARED BY:		
	Pressure		C. L. Young		
EXPERIMENTA	L VALUES:				
			Mole fraction of methylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
		·	CH 3NH 2		
283.15	100	0.133	0.448		
40J.IJ	200	0.267	0.546		
	300 400	0.400 0.533	0.603 0.645		
	500	0.667	0.680		
	600	0.800	0.708 0.727		
	700 760	0.933 1.013	0.736		
			- - -		
		AUXILIARY	INFORMATION		
METHOD/APPAI	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
	passed into a		1. British Drug Houses or Cambrian Gases sample.		
or pure 13 total pres	ssure measured	bler tube at a by a manometer			
assembly.	The amount of	f absorbed	2. Purified and attested by		
gas was es temperatur	stimated by we: se was manually	ighing. The y controlled	conventional procedures.		
to within	0.2K.				
	tus and procee by Gerrard [1]				
	-	:			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

COMPONENTS:			ORIGINAL MEASUREMENTS:
	amine (Methylami •89-51	ne); CH <sub>5</sub> N;	Gerrard, W.
-	•	[100 01 1]	Solubility of Gases and Liquids,
2. 1,4-01	$Oxane; C_4H_8O_2;$	[123-91-1]	Plenum 1976, Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:		
			Mole fraction of methylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
		<u></u>	
283.15	700 760	0.933 1.013	0.429 0.481
		<u></u>	
		AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS;
	assed into a kno quid in a bubble		<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>
total pres	sure measured by The amount of a	a manometer	
gas was es	timated by weigh was manually c	ing. The	conventional procedures.
to within	0.2K.		
	tus and procedur by Gerrard [1,2]		
1			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			l. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
1. Methana	mine (methyl	amine); CH <sub>5</sub> N;	Gerrard, W.		
	74-89-5]		Solubility of Gases and Liquids,		
	ol; C <sub>4</sub> H <sub>10</sub> O;	[7]-26-3]			
2. I-Butan	01; CtH100;	[11-20-2]	Plenum 1976, Chapter 10.		
VARIABLES:	·····		PREPARED BY:		
Tempe	rature, pres	sure	C. L. Young		
EXPERIMENTAL	VALUES:				
			Mole fraction of methylamine		
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
			<sup><i>x</i></sup> CH <sub>3</sub> NH <sub>2</sub>		
283.15	600	0.800	0.580		
	700 760	0.933 1.013	0.630 0.661		
293.15	760	1.013	0.554		
			-		
		AUXILIARY	INFORMATION		
METHOD/APPARA	TUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
		known weight	1. British Drug Houses or Cambrian		
		bler tube at a by a manometer	Gases sample.		
assembly.	The amount c	of absorbed	2. Purified and attested by		
	imated by we was manuall	ighing. The y control led	conventional procedures.		
to within 0	.2K.	-			
described b	us and proce y Gerrard [1	dure are			
	-				
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
1			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. 1976.		
	ۍ م		Chapter 1.		

[74-3 2. Benzener	89-5]	amine); CH <sub>5</sub> N; nzyl alcohol); 6]	ORIGINAL MEASUREMENTS: Gerrard, W. Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
Tempe:	rature, pres	sure	C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>	
273.15	100 200 300 400 500 600	0.133 0.267 0.400 0.533 0.667 0.800	0.420 0.506 0.571 0.630 0.680 0.731	
278.15 283.15 293.15	700 760 760 100 200 300 400 500	0.933 1.013 1.013 0.133 0.267 0.400 0.533 0.667	0.785 0.816 0.747 0.690 0.312 0.410 0.460 0.500 0.533	
	600 700 760	0.800 0.933 1.013	0.560 0.588 0.605	
		AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE: mine was passed into a known weight of pure liquid in a bubbler tube at a cotal pressure measured by a manometer ssembly. The amount of abosrbed as was estimated by weighing. The comperature was manually controlled to within 0.2K. The apparatus and procedure are lescribed by Gerrard [1,2].			SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
. Mother					
	namine (methyl 4-89-5]	amine): CH <sub>5</sub> N;	Gerrard, W.		
-	nylethanone (π	ethy]	Solubility of Gases and Liquids,		
	l ketone); C <sub>8</sub> E		Plenum <u>1976</u> , Chapter 10.		
VARIABLES:	· · · · · · · · · · · · · · · · · · ·		PREPARED BY:		
	Pressure		C. L. Young		
EXPERIMENTA	L VALUES:		I		
			Mole fraction of methylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
·			CH3NH2		
293.15	100	0.133	0.045		
	200 300	0.267 0.400	0.090 0.132		
	400	0.533	0.180		
	500 600	0.667 0.800	0.244 0.270		
	700 760	0.933 1.013	0.315 0.342		
			-		
		AUXILIARY	- INFORMATION -		
METHOD /APPA	RATUS/PROCEDURE :	AUXILIARY	• • • • • • • • • • • • • • • • • • •		
Amine was of pure 1: total pres	ssure measured	known weight bler tube at a by a manometer	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ %		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:		
Amine was of pure 1: total pre: assembly. gas was e: temperatu to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ %		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
	namine (Methyl	amine); CH <sub>5</sub> N;	Gerrard, W.		
	-89-5]		Solubility of Gases and Liquids,		
2. Ethoxy	vbenzene (ethy	vl phenyl '	Solubility of Gases and Liquias,		
ether	$\tilde{)}; C_{\theta}H_{10}O; [10]$	3-73-1]	Plenum <u>1976</u> , Chapter 10.		
VARIABLES:	······································		PREPARED BY:		
	Pressure		C. L. Young		
	11000410				
EXPERIMENTAL	VALUES:				
		_	Mole fraction of methylamine in liquid,		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
283.15	500	0.667	0.285		
	600 700	0.800 0.933	0.342 0.402		
l	760	1.013	0.436		
ĺ			, (		
		AUXILIARY	INFORMATION		
	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
	passed into a quid in a bubl	known weight bler tube at a	1. British Drug Houses or Cambrian Gases sample.		
total pres	sure measured	by a manometer	-		
	The amount of timated by we		2. Purified and attested by conventional procedures.		
temperatur	e was manually	y controlled			
to within The appara	0.2K. tus and proced	dure are			
descrbbed	by Gerrard [1	,2].			
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. 1976.		
			Chapter 1.		

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Methanamine Solubilities

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COMPONENTS :	;	<u></u>	ORIGINAL MEASUREMENTS:
1. Methar	namine (methyla	mine); CH <sub>5</sub> N;	Gerrard, W.
	-89-5]		Solubility of Gases and Liquids,
2. 1-0cta	anol; $C_8H_{18}O;$	[111-87-5]	
	11101) <del>-</del>	[	Plenum 1976, Chapter 10.
VARIABLES:			PREPARED BY:
Temp	perature, press	ure	C. L. Young
EXPERIMENT	AT WATHER.		
CALENTINI.	AL VALUED.		Mole fraction of methylamine in liquid,
<u>T/K</u>	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	<sup><i>x</i></sup> CH <sub>3</sub> NH <sub>2</sub>
273.15	100	0.133	0.300
	200	0.267 0.400	0.425 0.511
	400	0.533	0.582
	500	0.667	0.644
í.	600 700	0.800 0.933	0.705 0.763
	760	1.013	0.785
278.15	600	0.800	0.636
	700	0.933	0.692
283.15	760 100	1.013 0.133	0.728 0.255
200120	200	0.267	0.355
	300	0.400	0.424
1	400 500	0.533 0.667	0.485 0.537
	600	0.800	0.586
I	700	0.933	0.635
202.15	760	1.013	0.663
293.15	100 200	0.133 0.267	0.200 0.292
	300	0.400	0.357
	400	0.533	0.412
	500 600	0.667 0.800	0.458 0.498
	700	0.933	0.534
	760	1.013	0.554
		AUXILIARY	INFORMATION
	ARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure l	s passed into a iquid in a bubb	oler tube at a	l. British Drug Houses or Cambrian Gases sample.
	ssure measured The amount of		2. Purified and attested by
	stimated by wei		conventional procedures.
temperatu	re was manually		·····
to within			
	atus and proced by Gerrard [1,		
400011004	by Cerrara (1)	2].	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
*			REFERENCES:
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W.
			Solubility of Gases and Liquids.
			Plenum Press, New York. <u>1976</u> . Chapter 1.
			Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
1. Methan	amine (methyl	.amine); CH <sub>5</sub> N;	Gerrard, W.		
[74-	89-5]		Solubility of Gases and Liquids,		
2. Benzoi	c acid, ethyl	L ester (ethyl			
	oate); C <sub>9</sub> H <sub>10</sub>		Plenum <u>1976</u> , Chapter 10.		
	89-01	, - <b>z</b> ,			
VARIABLES:			PREPARED BY:		
ጥድ	mperature, pi	essure	C. L. Young		
			-		
EXPERIMENTAL	VALUES:	·····			
			Mole fraction of methylamine in liquid,		
т/к	P/mmHg	<i>P/</i> 10⁵Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
_,	. 5		CH 3MH2		
070 15	100	A 100	0.093		
273.15	100 200	0.133 0.267	0.187		
1	300	0.400	0.281		
	400	0.533	0.376		
	500	0.667 0.800	0.466 0.560		
	600 700	0.933	0.550		
	760	1.013	0.715		
283.15	100	0.133	0.062		
	200	0.267	0.126		
	300 400	0.400 0.533	0.188 0.256		
	500	0.667	0.318		
	600	0.800	0.373		
	700	0.933	0.444		
000 15	760	1.013 0.133	0.490 0.044		
293.15	100 200	0.267	0.088		
	300	0.400	0.135		
	400	0.533	0.180		
	500	0.667	0.224		
	600 700	0.800 0.933	0.272 0.320		
	760	1.013	0.348		
		AUXILIARY	INFORMATION		
METHOD/APPAF	ATUS/PROCEDURE:	<u></u>	SOURCE AND PURITY OF MATERIALS:		
		a known weight	1. British Drug Houses or Cambrian		
of pure li	quid in a bub	obler tube at a	Gases sample.		
total pres assembly.	sure measured The amount of	l by a manometer			
	timated by we	eighing. The	2. Purified and attested by conventional procedures.		
		ly controlled			
to within					
	tus and proce				
described	by Gerrard []	L,2]			
			ESTIMATED ERROR:		
]			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. 1976.		
1			Chapter 1.		
			Chapter 1.		

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COMPONENTS:		<u></u>	ORIGINAL MEASUREMENTS:		
1		lamine); CH <sub>5</sub> N;	Gerrard, W.		
[74	-89-5]		Solubility of Gases and Liquids,		
2. 1,1'-	-Oxybispentane c); C10H22O;	(Dipentyl [693-65-2]			
	.,, 010	••••••	Plenum <u>1976</u> , Chapter 10.		
VARIABLES:	۶ 		PREPARED BY:		
VARIABLES :	_				
	Pressure		C. L. Young		
EXPERIMENTA	L VALUES:				
			Mole fraction of methylamine		
T/K	P/mmHg	<i>P/</i> 10⁵Pa	in liquid,		
	,	•	CH <sub>3</sub> NH <sub>2</sub>		
0.00.0.0					
273.15	100 200	0.133 0.267	0.075 0.143		
	300 400	0.400 0.533	0.212 0.290		
	500	0.667	0.373		
	600 700	0.800 0.933	0.474 0.586		
	760	1.013	0.680		
			· · · ·		
		AUXILIARY	INFORMATION .		
METHOD/APPA	RATUS/PROCEDURE:	· · · · · · · · · · · · · · · · · · ·	SOURCE AND PURITY OF MATERIALS:		
		known weight bler tube at a	1. British Drug Houses or Cambrian Gases sample.		
total pres	ssure measured	l by a manometer			
	The amount c stimated by we		2. Purified and attested by conventional procedures.		
temperatu	re was manuall	y controlled			
to within The appara	0.2K. atus and proce	dure are			
described	by Gerrard [1	,2].			
	-		ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

COMPONENTS:	· · · · · · · · · · · · · · · · · · ·		ORIGINAL MEASUREMENTS:		
	amine (Methy	lamine); CH <sub>5</sub> N;	Gerrard, W.		
	89-5]		Solubility of Gases and Liquids,		
2. 1,1'-0	xybisoctane	(Dioctyl			
ether)	; C <sub>16</sub> H <sub>34</sub> O;	[629-82-3]	<i>Plenum</i> <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
			C. I. Voung		
	Temperature,	pressure	C. L. Young		
EXPERIMENTAL	VALUES:		······································		
			Mole fraction of methylamine		
		- · · · F	in liquid,		
Т/К	P/mmHg	<i>P/</i> 10⁵Pa	<sup><i>x</i></sup> CH <sub>3</sub> NH <sub>2</sub>		
	<u></u>	<u></u>			
273.15	100	0.133	0.076		
	200 300	0.267 0.400	0.144 0.215		
	400	0.533	0.284		
	500	0.667	0.356		
	600 700	0.800 0.933	0.440 0.530		
	760	1.013	0.604		
283.15	100	0.133	0.040		
	200 300	0.267 0.400	0.084 0.135		
	400	0.533	0.185		
	500	0.667	0.237		
	600 700	0.800 0.933	0.291 0.350		
	760	1.013	0.388		
		AUXILIARY	INFORMATION		
METHOD/APPAR	RATUS/PROCEDURE	:	SOURCE AND PURITY OF MATERIALS:		
		a known weight	1. British Drug Houses or Cambrian		
of pure li	quid in a bu	ubbler tube at a	Gases sample.		
assembly.	The amount	ed by a manometer of absorbed	2. Purified and attested by		
gas was es	stimated by w	veighing. The	conventional procedures.		
temperatur to within		lly controlled			
	tus and prod	cedure are			
described	by Gerrard	[1,2].			
		9			
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
	namine (Methyl -89-5]	amine); CH <sub>5</sub> N;	Gerrard, W.		
-	-		Solubility of Gases and Liquids,		
<pre>2. N,N-Dimethylformamide; C<sub>3</sub>H<sub>7</sub>NO; [68-12-2]</pre>			Plenum 1976, Chapter 10.		
Ciu	7NU; [00-12-2	1	Ttenum 1976, Chapter 10.		
VARIABLES:			PREPARED BY:		
5	Temperature, p	ressure	C. L. Young		
EXPERIMENTAL	VALUES:				
			Mole fraction of methylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
1/K	r/ming	1/10 Fa	<sup><i>x</i></sup> CH <sub>3</sub> NH <sub>2</sub>		
273.15	100	0.133	0.098		
	200	0.267	0.197		
	300 400	0.400 0.533	0.296 0.395		
	500	0.667	0.494		
	600	0.800	0.593		
	700 760	0.933 1.013	0.693		
278.15	100	0.133	0.752 0.080		
	200	0.267	0.160		
	300	0.400	0.240		
	400 500	0.533 0.667	0.335 0.398		
	600	0.800	0.478		
	700	0,933	0.560		
	760	1.013	0.601		
283.15	100 200	0.133 0.267	0.065 0.130		
	300	0.400	0.196		
	400	0.533	0.262		
	500	0.667	0.326		
			(cont.)		
		AUXILIARY	INFORMATION		
ETHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
	passed into a	known weight	1. British Drug Houses or Cambrian		
f pure li	quid in a bubb	ler tube at a	Gases sample.		
otal pres	sure measured	by a manometer	2. Purified and attested by		
	The amount of timated by wei		conventional procedures.		
	e was manually		· · · · · · · · · · · · · · · · · · ·		
o within	0.2K.				
	tus and proced				
escribed i	by Gerrard [1,	2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>,22 623-650.</pre>		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York, 1976.		
			Chapter 1.		

COMPONEN	rs:		ORIGINAL MEASUREMENTS:		
[74- 2. <i>N</i> , <i>N</i> -Di	namine (Methy] -89-5] imethylformami <sub>2</sub> NO; [68-12-2		Gerrard, W. <i>Solubility of Gases and Liquids</i> , <i>Plenum <u>1976</u>, Chapter 10.</i>		
EXPERIMEN	NTAL VALUES:	Continued:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
283.15	600 700 760	0.800 0.933 1.013	0.394 0.454 0.500		
293.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.040 0.084 0.127 0.172 0.216 0.264 0.311 0.340		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
74-8 2. <i>N</i> , <i>N</i> -Dim	amine, (methylan 39-5 methylmethanamin methylamine); (	ne	Wolff, H.; Würtz, R. Z. Phys. Chem. (Frankfurt am Main) <u>1969</u> , 67, 115-121.		
75-	-50-3	39			
VARIABLES:	······································		PREPARED BY:		
	sition tompor			C T Ford	
Compc	sition, temper	acure	F.	G. T. Fogg	
EXPERIMENTAL	VALUES:			<u>, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	
Variation a	of the total vand of mole frac	apor pressure ction of CH <sub>5</sub> N	e/Torr with vari I in the liquid	ation of tempe phase, <sup>x</sup> CH <sub>5</sub> N	erature
			T/K	C.	
<sup>ж</sup> сн <sub>5</sub> м	223.15	233.15	253.15	273.15	293.15
		100.0			10
0 0.0113	56.4 58.3	102.3 105.3	288.3 294.8	676.9 688.4	1387.0 1414.1
0.0287	59.3	105.3	302.0	708.3	1449.9
0.0315	59.8	108.3	303.4	710.2	1458.6
0.0472	60.3	109.7	310.0	725.2	1488.1
0.0496	60.9	110.2	311.1	728.6	1496.0
0.0984	62.8	116.5	329.5	773.9	1585.0
0.1504 0.1983	66.2 68.3	120.8 125.4	344.7 358.2	812.6 847.5	1670.3 1747.9
0.2473	69.3	127.7	368.3	875.8	1812.8
0.2980	70.6	130.6	378.7	905.2	1878.8
0.3693	71.1	132.8	389.3	934.6	1953.2
0.4046	72.5	135.0	394.2	947.3	1982.0
0.4482	73.6	136.2	399.1	963.7	2023.0
0.4995	72.8	136.6	404.0	977.9	2063.3
0.5080 0.5397	73.6 72.4	137.0 136.7	404.0 407.3	979.7 990.7	2067.0 2091.1
0.6000	72.9	137.9	411.2	1002.8	2130.9
				Cont.	
<b></b>	<u></u>	AUXILIARY	INFORMATION	······································	
METHOD /APPARA	TUS/PROCEDURE:		SOURCE AND PURITY	OF MATERIALS:	
		_			
	lescribed previ Liquid mixture		1 & 2. Prepar		_
	known composit			ng hydrochlori repeated frac	
	into a cell he		until the fi	rst and last	fractions
thermostat	controlled to	± 0.02°C.	had vapor pressures which differed		
	apor pressure	was measured			
by a mercur	ry manometer.		of the press	ure measuremen	nts (l),
The authors	calculated ac	tivitv	(4).		
	s of each comp				
the vapor p	ressure data b	y a method	}		
	y Barker (2).		ESTIMATED ERROR:		
	-Kister equation Defficients were			(optimated by	
and reporte		e evaluated	$\delta T/K = \pm 0.02$ (estimated by authors)		
			REFERENCES:		
			1. Wolff, H.;	Höpfner, A. Z.	Elektro-
			chem. <u>1962</u> ,	66, 149.	1050
			2. Barker, J.A 6, 207.	. AUST. J. Che	em. <u>1953</u> ,
			3. Redlich, O.	; Kister, A.T.	Ind. Eng
			Chem. 1948,	21, 345.	
			4. Wolff, H.;	Würtz, R. <i>Ber</i> .	Bunsen-
			ges. Phys.	<u>Chem. 1968, 72</u>	<u>, 101.</u>

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
<pre>1. Methanamine, (methylamine); CH<sub>5</sub>N; 74-89-5 2. N,N-Dimethylmethanamine (trimethylamine); C<sub>3</sub>H<sub>9</sub>N; 75-50-3</pre>		Wolff, H.; Würtz, R. Z. Phys. Chem. (Frankfurt am Main) <u>1969</u> , 67, 115-121.			
VARIABLES:			PREPARED BY:		
Comp	osition, tempera	ture	Р.	G. T. Fogg	
EXPERIMENTAL	VALUES: Cont.		· ·····	<u> </u>	<u> </u>
			т/к		
<sup>x</sup> ch <sub>5</sub> n	223.15	233.15	253.15	273.15	293.15
0.6196 0.6444 0.6980 0.7492 0.7979 0.8487 0.8961 0.9491 1	74.3 73.4 73.8 73.1 72.4 71.5 70.5 67.7 65.4	138.8 137.7 138.0 138.2 136.9 135.8 133.6 129.6 126.3	412.3 413.3 413.8 415.3 414.0 412.4 409.1 401.7 394.2	1010.7 1015.4 1018.8 1023.3 1025.4 1026.6 1018.7 1011.8 1001.8	2139. 2149. 2175. 2191. 2202. 2207. 2212. 2205. 2205. 2191.
com	stants for calcul Redlich- T/K		tions given be		
	223.15 233.15 243.15 253.15 263.15 273.15 283.15 293.15	0.732 0.714 0.685 0.656 0.622 0.581 0.547 0.510	-0.010 -0.025 0.002 0.006 0.016 0.026 0.035 0.037	0.127 0.087 0.034 0.043 0.025 0.008 0.003 0.012	
		-		$-8 x_1 + 12 x_1^2$	
$\ln f_2$	$= A x_1^2 + B$	$x_1^2(1 - 4 x_1)$	$_{2}$ ) + C $x_{1}^{2}$ (1	$-8x_2 + 12x_2^2$ )	
	<b>-</b>	coefficient tion of meth	of trimethylan nylamine in the	nine	

COMPONENTS :			ORIGINAL MEASUREMENTS:
	namine (Methyl 1-89-5]	amine); CH <sub>5</sub> N;	Gerrard, W.
-	line; C <sub>5</sub> H <sub>5</sub> N;	[110-86-1]	Solubility of Gases and Liquids,
or Quinc	oline; C <sub>9</sub> H <sub>7</sub> N;	[91-22-5]	<i>Plenum 1976,</i> Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENT	AL VALUES:		
			Mole fraction of methylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
· · · · · · · · · · · · · · · · · · ·		Pyridine;	C <sub>5</sub> H <sub>5</sub> N; [110-86-1]
283.15	500 600	0.667 0.800	0.308 0.372
	700	0.933	0.444
	760	1.013	0.488
		Quinoline;	C <sub>9</sub> H <sub>7</sub> N; [91-22-5]
283.15	100 200	0.133 0.267	0.060 0.120
	300	0.400	0.181
	400 500	0.533	0.243 0.302
	600	0.800	0.362
	700 760	0.933 1.013	0.421 0.456
			-
		AUXI LI ARY	INFORMATION
METHOD / APP	ARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
	s passed into a Liquid in a bub	known weight bler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>
total pre	essure measured	l by a manometer	-
gas was e	The amount constinues the stimated by we	ighing. The	2. Purified and attested by conventional procedures.
temperatu to within	ire was manuall	y controlled	
The appar	atus and proce		
described	l by Gerrard [1	,2].	
			ESTIMATED ERROR:
			$\delta T/k = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</pre>
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976. Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
<pre>1. Methanamine (Methylamine); CH₅N; [74-89-5]</pre>			Gerrard, W.
<pre>2. Nitrobenzene; C<sub>6</sub>H<sub>5</sub>NO<sub>2</sub>; [98-95-3]</pre>			Solubility of Gases and Liquids,
			Plenum <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure	-	C. L. Young
EXPERIMENTAL	L VALUES:	,	
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
			······································
283.15	100 200 300	0.133 0.267 0.400	0.053 0.105 0.158
	400 500	0.533 0.667	0.209 0.264
	600 700	0.800 0.933	0.324 0.391
	760	1.013	0.436
		AUXILIARY	INFORMATION
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li	iquid in a bub	known weight bler tube at a	1. British Drug Houses or Cambrian Gases sample.
assembly. gas was es temperatur to within The appara	The amount o stimated by we re was manuall	ighing. The y controlled dure are	2. Purified and attested by conventional procedures.
			ESTIMATED ERROR:
			$\delta T/K = \frac{+}{0.1};  \delta x/x = \frac{+}{3}$ %
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			023-050.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
	amine (Methylami 89-5]	ne); CH <sub>5</sub> N;	Gerrard, W.
	amine (Aniline);	$C_6H_7N;$	Solubility of Gases and Liquids,
[62-]	53-3]		Plenum <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:	<u> </u>	Mole fraction of methylamine
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
1/1	1 / Illing	1/10 FA	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
283.15	100	0.133	0.153
	200 300	0.267 0.400	0.269 0.363
	400	0.533	0.436
	500 600	0.667 0.800	0.496 0.551
[	700 760	0.933 1.013	0.604 0.634
}	700	1.013	0.034
		AUXILIARY	INFORMATION
METHOD/APPARA	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li	passed into a kn quid in a bubble sure measured by	er tube at a	1. British Drug Houses or Cambrian Gases sample.
assembly. gas was es temperature to within The appara	The amount of a timated by weigh e was manually c	bsorbed ing. The controlled e are	2. Purified and attested by conventional procedures.
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W.
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTES			ODICINAL NELCURRENTING
COMPONENTS:			ORIGINAL MEASUREMENTS:
	amine (Methylam	ine); CH <sub>5</sub> N;	Gerrard, W.
[74-	89-5]		Solubility of Gases and Liquids,
2. Benzon	itrile; C7H5N;	[100-47-0]	Plenum 1976, Chapter 10.
			1 venum <u>1970</u> , enapter 10.
		1	
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:		
1			
			Mole fraction of methylamine
			in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
283.15	100	0.133	0.075
	200 300	0.267 0.400	0.140 0.204
	400	0.533	0.273
	500	0.667	0.341
	600 700	0.800 0.933	0.411 0.497
	760	1.013	0.516
. <u>-</u>		AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE:	· ····································	SOURCE AND PURITY OF MATERIALS:
	passed into a k	nown weight	1. British Drug Houses or Cambrian
of pure li	quid in a bubbl	er tube at a	Gases sample.
	sure measured b The amount of		2. Purified and attested by
gas was es	timated by weig	hing. The	conventional procedures.
temperatur	e was manually		
to within The appara	tus and procedu	re are	
	by Gerrard [1,2		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.
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COMPONENTS:	<u>.                                    </u>		ORIGINAL MEASUREMENTS:	-
	namine (Methyl	amine); CH <sub>5</sub> N;	Gerrard, W.	
[74-89-5]			Solubility of Gases and Liquids,	
<pre>2. l-Methyl-2-nitrobenzene  (σ-nitrotoluene); C<sub>7</sub>H<sub>7</sub>NO<sub>2</sub>;  [88-72-2]</pre>			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:		- <u></u>	PREPARED BY:	
	Pressure		C. L. Young	
	FIESSULE		c. h. roung	
EXPERIMENTAL	L VALUES:	<u></u>	L	
			Mole fraction of methylamine	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,	
17 K	r / numrg	I/IU FA	$x$ CH $_3$ NH $_2$	
283.15	100	0.133	0.050	
	200	0.267	0.105	
	300 400	0.400 0.533	0.158 0.205	
	500 600	0.667 0.800	0.257 0.311	
	700	0.933	0.367	
	760	1.013	0.408	
		AUXILIARY	INFORMATION	
ME THOD /AP P A R	RATUS / PROCEDURE :	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:	
	RATUS/PROCEDURE: passed into a	<u></u>		
Amine was of pure li	passed into a quid in a bub	known weight bler tube at a	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	
Amine was of pure li total pres assembly. gas was es temperatur to within	passed into a quid in a bub sure measured The amount of timated by we was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o stimated by we to was manually	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS; 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub soure measured The amount of stimated by we ce was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS; 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub soure measured The amount of stimated by we ce was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	<ul> <li>SOURCE AND PURITY OF MATERIALS;</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> </ul>	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub soure measured The amount of stimated by we ce was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub soure measured The amount of stimated by we ce was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub soure measured The amount of stimated by we ce was manually 0.2K.	known weight bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	

COMPONENTS:			ORIGINAL MEASUREMENTS:
l. Methan CH <sub>5</sub> N;	amine, (methy: [74-89-5]	Lamine);	Gerrard, W.
2. Benzen C <sub>7</sub> H <sub>9</sub> N;	emethanamine, [100-46-9]	(Benzylamine)	Solubility of Gases and Liquids, Plenum, <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	. VALUES:	· · ·	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
283.15	100 200 300	0.133 0.267 0.400	0.084 0.156 0.224
	400 500	0.533 0.667	0.289 0.355
	600 700	0.800 0.933	0.419 0.482
	760	1.013	0.520
		AUXILIARY	INFORMATION
METHOD/APPAR	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
Amine was of pure 1:	passed into a iquid in a bub	known weight bler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>
assembly. gas was es temperatur to within The appara	The amount on the stimated by we be the stimated by we be the state of	eighing. The y controlled edure are	2. Purified and attested by conventional procedures.
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids.
			Plenum Press, New York. 1976. Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
		amine); CH <sub>5</sub> N;	Gerrard, W.
[74-	-89-5]		Solubility of Gases and Liquids,
2. N-Methylaniline (N-methyl- benzenamine); C7H <sub>9</sub> N;			Plenum 1976, Chapter 10.
[100-61-8]			1907/am 1370, Onapoer 10.
VARIABLES:			PREPARED BY:
	·		
Τe	emperature, pr	essure	C. L. Young
EXPERIMENTAL	L VALUES:		la
			Mole fraction of methylamine
т/к	P/mmHq	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
	- / 5	,	CH 3NH 2
273.15	100 200	0.133 0.267	0.175 0.309
	300	0.400	0.421
1	400	0.533	0.509
	500	0.667 0.800	0.588 0.666
	600 700	0.933	0.742
	760	1.013	0.788
283.15	100 200	0.133 0.267	0.126 0.226
ł	300	0.400	0.312
	400	0.533	0.384
	500	0.667 0.800	0.447 0.507
	600 700	0.933	0.564
	760	1.013	0.596
			-
		AUXILIARY	INFORMATION
METHOD/APPAF	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
Amine was of pure li	passed into a louid in a bubl	known weight oler tube at a	l. British Drug Houses or Cambrian Gases sample.
total pres	ssure measured	by a manometer	-
	The amount of stimated by we		2. Purified and attested by conventional procedures.
temperatur	re was manually	controlled	convencional procedures.
to within	0.2K.		
	tus and procee by Gerrard [1]		
}			
			ESTIMATED ERROR:
l			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
1			REFERENCES:
			l. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.
L			L

Gerrard, W.
Solubility of Gases and Liquids,
<i>Plenum <u>1976</u>, Chapter 10.</i>
PREPARED BY:
C. L. Young
Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
0.168 0.300 0.410 0.495 0.572 0.650 0.730 0.730 0.117 0.212 0.300 0.382 0.438 0.500 0.557 0.592
INFORMATION
SOURCE AND PURITY OF MATERIALS:
<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> </ol>
ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
1. Methar	namine (methy] -89-5]	Lamine); CH <sub>5</sub> N;	Gerrard, W.
_			Solubility of Gases and Liquids,
<pre>2. l-Octanamine (octylamine); C<sub>8</sub>H<sub>19</sub>N; [lll-86-4]</pre>			Plenum <u>1976</u> , Chapter 10.
VARIABLES:		<u></u>	PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	L VALUES:	<u> </u>	I
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
		<u></u>	
283.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.066 0.130 0.196 0.259 0.325 0.390 0.455 0.493
	<u></u>	<u></u>	
			- -
		AUXILIARY	INFORMATION
METHOD/APPAR	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li	iquid in a bub	h known weight bbler tube at a l by a manometer	l. British Drug Houses or Cambrian Gases sample.
assembly. gas was es temperatur to within The appara	The amount o stimated by we te was manuall	of absorbed eighing. The y controller edure are	2. Purified and attested by conventional procedures.
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTS:			ORIGINAL MEASUREMENTS:
<pre>1. Methanamine (Methylamine); CH<sub>5</sub>N; [74-89-5]</pre>			Gerrard, W.
2. N,N-Dimethylaniline			Solubility of Gases and Liquids,
<pre>2. N,N-Dimethylaniline (N,N-dimethylbenzenamine); C<sub>8</sub>H<sub>11</sub>N; [121-69-7]</pre>			Plenum <u>1976</u> , Chapter 10.
VARIABLES:	···· ·································	······································	PREPARED BY:
	Temperature, p	pressure	C. L. Young
EXPERIMENTA	L VALUES:		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of methylamine in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
273.15	100 200 300 400 500 600 700	0.133 0.267 0.400 0.533 0.667 0.800 0.933	0.076 0.149 0.223 0.302 0.389 0.488 0.600
283.15	760 100 200 300 400 500 600 700	1.013 0.133 0.267 0.400 0.533 0.667 0.800 0.933	0.672 0.050 0.102 0.153 0.205 0.256 0.309 0.366
			INFORMATION
METHOD /ADDA	PATHS (PROCEDURE.		
Amine was of pure 1: total pres assembly. gas was es temperatur to within The appara	ssure measured The amount o stimated by we re was manuall	bler tube at a by a manometer f absorbed righing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:	<u></u>		ORIGINAL MEASUREMENTS:
	namine (Methyl -89-5]	Lamine); CH <sub>5</sub> N;	Gerrard, W.
-	iethylaniline		Solubility of Gases and Liquids,
(N, N-c)	liethylbenzena sN; [91-66-7]	amine);	Plenum 1976, Chapter 10.
	SN; [91-00-,]	I	
VARIABLES:	<u></u>		PREPARED BY:
r I	Cemperature, p	oressure	C. L. Young
EXPERIMENTAL	11AT 11FQ .	<u> </u>	L
GAL DUTLING TO	VALUED:		
	,		Mole fraction of methylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x CH <sub>3</sub> NH <sub>2</sub>
273.15	100	0.133	0.073
2,0	200	0.267	0.144
	300	0.400	0.215
	400 500	0.533 0.667	0.290 0.376
	600	0.800	0.476
Í	700	0.933	0.584
283.15	760	1.013 0.133	0.655 0.044
283.15	100 200	0.133	0.044
	300	0.400	0.130
	400	0.533	0.174
	500 600	0.667 0.800	0.217 0.263
	700	0.933	0.316
	760	1.013	0.360
••••••••••••••••••••••••••••••••••••••			
			-
		AUXILIARY	INFORMATION
	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
		known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.
		by a manometer	
assembly.	The amount o	f absorbed	2. Purified and attested by
	timated by we e was manuall		conventional procedures.
temperatur to within		y controlleu	
The appara	tus and proce		
described	by Gerrard [1	,2].	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976.
	_		Chapter 1.

COMPONENTS:		······································	ORIGINAL MEASUREMENTS:		
			ORIGINAL MEASUREMENTS:		
1. Methanamine, (methylamine);			Gerrard, W.		
$CH_5N;$ [74-89-5]			Solubility of Gases and Liquids,		
2. Chlori	inated methanes		Plenum, 1976, Chapter 10.		
			<u>1000000000000000000000000000000000000</u>		
VARIABLES:	··· <del>··································</del>				
VARIABLES.			PREPARED BY:		
Ten	nperature, pres	sure	C.L. Young		
EXPERIMENTA	WAT UPO -				
EXPERIMENTAL	L VALUES:				
			Mole fraction of methylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
			<sup><i>x</i></sup> CH <sub>3</sub> NH <sub>2</sub>		
Trichloromethane (chloroform); CHCl <sub>3</sub> ; [67-66-3]					
273.15	760	1.013	0.778		
283.15	700 760	0.933 1.013	0.614 0.644		
	700	1.013	0.044		
Τe	etrachlorometha	ne (carbon tet	rachloride); CCl <sub>4</sub> ; [56-23-5]		
283.15	760	1.013	0.400		
		AUXILIARY	INFORMATION		
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
Amine was	passed into a	known weight	1. British Drug Houses or Cambrian		
of pure 1	iquid in a bub	bler tube at a	Gases sample.		
assembly.	The amount o	by a manometer f absorbed	2. Purified and attested by		
gas was e	stimated by we	ighing. The	conventional procedures.		
temperatu	re was manuall 0.2K.	y controlled			
The appar	atus and proce	dure are			
described	by Gerrard [1	, 2]•			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES: 1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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<pre>1. Methanamine, (methylamine);</pre>	CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	ys. Chem. . Fogg
$\begin{array}{c} CH_{5}N; \ [74-89-5] \\ 2. \ Tetrachloromethane (carbon tetrachloride); \ CCl_4; \ [56-23-5] \\ \hline \\ VARIABLES: & P Composition, temperature \\ \hline \\ Composition, temperature \\ \hline \\ Composition, temperature \\ \hline \\ Variation of total vapor press temperature and of mole fraction of \\ \hline \\ & CH_5N 253.15 \\ \hline \\ \hline \\ & 0 & 10.0 \\ 0.0099 18.5 \\ 0.0250 30.6 \\ 0.0511 48.1 \\ 0.0783 69.0 \\ 0.1016 79.4 \\ 0.128 91.7 \\ 0.154 103.7 \\ 0.201 127.1 \\ 0.254 149.2 \\ 0.301 165.6 \\ 0.353 184.2 \\ 0.401 199.9 \\ 0.454 217.8 \\ 0.502 232.4 \\ 0.553 248.2 \\ 0.605 264.1 \\ \hline \\ \hline \\ & AUXILIARY IN \\ \hline \\ METHOD/APPARATUS/PROCEDURE: \\ Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were \\ \hline \end{array}$	Ber. Bunsenges. Ph 1968, 72, 101-109. PREPARED BY: P. G. T Sure/Torr with varie CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 50.31 1 547.9 1 587.0 1 625.9 1	2. Fogg .ation of .d phase, $x_{CH_5N}$ 293.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
2. Tetrachloromethane (carbon tetrachloride); CCl <sub>4</sub> ; [56-23-5] VARIABLES: Composition, temperature EXPERIMENTAL VALUES: Variation of total vapor press temperature and of mole fraction of $\frac{x}{CH_5N}$ 253.15 0 10.0 0.0099 18.5 0.0250 30.6 0.0511 48.1 0.0783 69.0 0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	<u>1968</u> , 72, 101-109. PREPARED BY: P. G. T Sure/Torr with varie CH <sub>5</sub> N in the liquie T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	2. Fogg ation of d phase, $x_{CH_5N}$ 293.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
2. Tetrachloromethane (carbon tetrachloride); CCl <sub>4</sub> ; [56-23-5]         VARIABLES:       P         Composition, temperature       P         EXPERIMENTAL VALUES:       Variation of total vapor press temperature and of mole fraction of $\frac{x}{CH_5N}$ 253.15         0       10.0         0.0099       18.5         0.0250       30.6         0.01016       79.4         0.128       91.7         0.154       103.7         0.201       127.1         0.254       149.2         0.301       165.6         0.353       184.2         0.401       199.9         0.454       217.8         0.502       232.4         0.503       264.1	PREPARED BY: P. G. T Sure/Torr with vari CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	2. Fogg ation of d phase, $x_{CH_5N}$ 293.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
tetrachloride); CCl <sub>4</sub> ; [56-23-5]         VARIABLES:       P         Composition, temperature       P         EXPERIMENTAL VALUES:       Variation of total vapor press temperature and of mole fraction of	P. G. T sure/Torr with vari CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	Ation of d phase, $x_{CH_5N}$ 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
VARIABLES:       P         Composition, temperature       P         EXPERIMENTAL VALUES:       Variation of total vapor press temperature and of mole fraction of	P. G. T sure/Torr with vari CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	Ation of d phase, $x_{CH_5N}$ 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
Composition, temperature           EXPERIMENTAL VALUES:           Variation of total vapor press temperature and of mole fraction of	P. G. T sure/Torr with vari CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	Ation of d phase, $x_{CH_5N}$ 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
EXPERIMENTAL VALUES:         Variation of total vapor press temperature and of mole fraction of	Sure/Torr with vari E CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	Ation of d phase, $x_{CH_5N}$ 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
EXPERIMENTAL VALUES:         Variation of total vapor press temperature and of mole fraction of	Sure/Torr with vari E CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	ation of d phase, <sup>x</sup> <sub>CH<sub>5</sub>N</sub> 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
Variation of total vapor press temperature and of mole fraction of <i>x</i> CH <sub>5</sub> N         253.15           0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	d phase, <sup>x</sup> CH <sub>5</sub> N 993.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
Variation of total vapor press temperature and of mole fraction of <i>x</i> CH <sub>5</sub> N         253.15           0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	d phase, <sup>x</sup> CH <sub>5</sub> N 93.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
temperature and of mole fraction of <i>x</i> CH <sub>5</sub> N       253.15         0       10.0         0.0099       18.5         0.0250       30.6         0.0511       48.1         0.0783       69.0         0.1016       79.4         0.128       91.7         0.154       103.7         0.201       127.1         0.254       149.2         0.301       165.6         0.353       184.2         0.401       199.9         0.454       217.8         0.502       232.4         0.553       248.2         0.605       264.1	CH <sub>5</sub> N in the liqui T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	d phase, $x_{CH_5N}$ 993.15 90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
x         253.15           0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	T/K 273.15 2 33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	273.15       2         33.0       51.6         79.4       121.0         160.9       193.8         227.6       256.2         313.0       369.0         413.5       461.3         503.1       1         547.9       1         587.0       1         625.9       1	90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	33.0 51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	90.5 126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0         10.0           0.0099         18.5           0.0250         30.6           0.0511         48.1           0.0783         69.0           0.1016         79.4           0.128         91.7           0.154         103.7           0.201         127.1           0.254         149.2           0.301         165.6           0.353         184.2           0.401         199.9           0.454         217.8           0.502         232.4           0.553         248.2           0.605         264.1	51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.0099 18.5 0.0250 30.6 0.0511 48.1 0.0783 69.0 0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	51.6 79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.0250 30.6 0.0511 48.1 0.0783 69.0 0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	79.4 121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	126.6 181.2 265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.0511 48.1 0.0783 69.0 0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	121.0 160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	265.2 341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.0783 69.0 0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	160.9 193.8 227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	341.4 416.0 486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.1016 79.4 0.128 91.7 0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	227.6 256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	486.5 536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.154 103.7 0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	256.2 313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	536.9 662.7 783.6 882.6 991.4 078.6 179.9
0.201 127.1 0.254 149.2 0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	313.0 369.0 413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	662.7 783.6 882.6 991.4 078.6 179.9
0.301 165.6 0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	413.5 461.3 503.1 1 547.9 1 587.0 1 625.9 1	882.6 991.4 078.6 179.9
0.353 184.2 0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	461.3 503.1 1 547.9 1 587.0 1 625.9 1	991.4 078.6 179.9
0.401 199.9 0.454 217.8 0.502 232.4 0.553 248.2 0.605 264.1 METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	503.1       1         547.9       1         587.0       1         625.9       1	078.6 179.9
0.502 232.4 0.553 248.2 0.605 264.1 AUXILIARY IN METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	587.0 1 625.9 1	
0.553 248.2 0.605 264.1 AUXILIARY IN METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	625.9 1	268.6
0.605 264.1 AUXILIARY IN METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were		347.3
METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were		452.3
METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were		-
METHOD/APPARATUS/PROCEDURE: S Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	С	ont.
Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	NFORMATION	
Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were	SOURCE AND PURITY OF MA	ATERIALS ;
used (1), (2). Liquid mixtures of accurately known composition were	1. Prepared from c	commercial reinst
	methylammonium	
		tionated until the fractions had vapor
thermostat controlled to ± 0.02°C.	pressures which	differed by less
The total vapor pressure was measured	than the limits pressure measur	of error of the
by a mercury manometer but contact between vapor and mercury was avoided	pressure measur	CHICHLO (1/.
	2. Merck "Uvasol".	
manometer as a null instrument with		
pressure of vapor balanced against that of carbon dioxide. Metal taps		
were used so as to avoid contact	STIMATED ERROR:	
between vapor and tap grease.		
	$\delta T/K = \pm 0.02$ (est	imated by authors)
coefficients of each component from the vapor pressure data by a method		
described by Barker (3). Constants	REFERENCES:	
	1. Wolff, H.; Höpf	ner, A. Z. Elektro-
Learning the second second second	chem. <u>1962</u> , 66,	149.
also calculated by the authors.	2. Wolff, H.; Höpp Bunsenges. Phys	. <i>Chem.</i> <u>1966</u> ,70, 874
] [ ]	3. Barker, J.A. Au	st. J. Chem. <u>1953</u> ,
	6, 207. A Dodlich O. Ki	
1	4. Realich, O.; Ki	ster, A.T. Ind. Eng
	<ol> <li>Barker, J.A. Au</li> <li>6, 207.</li> <li>Redlich, O.; Ki</li> </ol>	st. J. Chem. <u>1953</u> , ster, A.T. Ind. Eng

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				ORIGINAL MEASUREM	ENTS:	
1. Methana			nine);	Wolff, H.; WÜ	irtz, R.	
CH5N	; [74-	89-5]		Ber. Bunsenge	-	<i>n</i> .
2. Tetrack	Tetrachloromethane (carbon		arbon	<u>1968</u> , 72, 101	-109.	
tetracl	nlorid	e); CCl <sub>4</sub> ;	[56-23-5]			
ARIABLES:		······		PREPARED BY:		
Com	Composition, temperature			Р.	G. T. Fogg	
EXPERIMENTAL	VALUES	: Cont.	,			
				T/K		
	<i>x</i>		050 15	·	000 15	
	<sup>∞</sup> CH <sub>5</sub> N		253.15	273.15	293.15	
	0.65			702 6	1522 6	-
	0.65 0.70		277.9 292.6	703.6 743.2	1533.6 1616.9	
	0.80		323.4 357.0	820.1 903.9	1795.0 1978.2	
	1		394.2	1001.8	2191.7	
	t	from the R	edlich-Kiste	of activity co r equations giv	en below	
		т/к	А	В	С	_
		т/к 253.15	A 0.650	B -0.085	C 0.051	-
	2	253.15				-
	2	253.15 263.15 273.15	0.650 0.630 0.587	-0.085 -0.071 -0.051	0.051	-
		253.15 263.15 273.15 283.15	0.650 0.630 0.587 0.563	-0.085 -0.071 -0.051 -0.036	0.051 0.027 0.023 0.025	-
		253.15 263.15 273.15	0.650 0.630 0.587	-0.085 -0.071 -0.051	0.051 0.027 0.023	-
	2	253.15 263.15 273.15 283.15 293.15	0.650 0.630 0.587 0.563 0.524	-0.085 -0.071 -0.051 -0.036 - 0.030	0.051 0.027 0.023 0.025 0.025	-
	2 2 2 	253.15 263.15 273.15 283.15 293.15 $x_{2}^{2}$ -	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4)$	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$	$\begin{array}{c} 0.051 \\ 0.027 \\ 0.023 \\ 0.025 \\ 0.025 \end{array}$	
	2 2 2 	253.15 263.15 273.15 283.15 293.15 $x_{2}^{2}$ -	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4)$	-0.085 -0.071 -0.051 -0.036 - 0.030	$\begin{array}{c} 0.051 \\ 0.027 \\ 0.023 \\ 0.025 \\ 0.025 \end{array}$	
$\ln f_2$	= F = F	$253.15$ $263.15$ $273.15$ $283.15$ $293.15$ $x_2^2 - x_1^2 + $	$0.650 \\ 0.630 \\ 0.587 \\ 0.563 \\ 0.524 $ B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $x_{1}) + C x_{2}^{2}(1) \\x_{2}) + C x_{1}^{2}(1)$	$\begin{array}{c} 0.051\\ 0.027\\ 0.023\\ 0.025\\ 0.025\\ \end{array}$ $\begin{array}{c} - 8 \ x_1 + 12\\ - 8 \ x_2 + 12 \end{array}$	
$\ln f_2$	$= P$ $= f_1 = $	$x_{2}^{2} = x_{1}^{2} + activit$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} + C x_{2}^{2}(1) \\ x_{2} + C x_{1}^{2}(1) \\ t \text{ of methylaming} \end{array}$	$\begin{array}{c} 0.051\\ 0.027\\ 0.023\\ 0.025\\ 0.025\\ \end{array}$ $\begin{array}{c} -8 \ x_1 \ +12\\ -8 \ x_2 \ +12\\ \end{array}$	
$\ln f_2$	$= F$ $= f_1$ $f_2$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficienty	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} \end{pmatrix} + C x_{2}^{2} (1) \\ x_{2} \end{pmatrix} + C x_{1}^{2} (1) \\ t \text{ of methylaming} \\ t \text{ of carbon tet} \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1 + 12$ - 8 $x_2 + 12$ e rachloride	x <sub>2</sub> <sup>2</sup> )
$\ln f_2$	$= F$ $= f_{1} = f_{2} = x$ $x_{1} = f_{2} = x$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} + C x_{2}^{2}(1) \\ x_{2} + C x_{1}^{2}(1) \\ t \text{ of methylamine} \\ t \text{ of carbon tet:} \\ thylamine in the } \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1$ + 12 - 8 $x_2$ + 12 e rachloride e liquid phas	x <sub>2</sub> <sup>2</sup> ) e
$\ln f_2$	$= F$ $= f_{1} = f_{2} = x$ $x_{1} = f_{2} = x$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} \end{pmatrix} + C x_{2}^{2} (1) \\ x_{2} \end{pmatrix} + C x_{1}^{2} (1) \\ t \text{ of methylaming} \\ t \text{ of carbon tet} \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1$ + 12 - 8 $x_2$ + 12 e rachloride e liquid phas	x <sub>2</sub> <sup>2</sup> ) e
$\ln f_2$	$= F$ $= f_{1} = f_{2} = x$ $x_{1} = f_{2} = x$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x_1^$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} + C x_{2}^{2}(1) \\ x_{2} + C x_{1}^{2}(1) \\ t \text{ of methylamine} \\ t \text{ of carbon tet:} \\ thylamine in the } \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1$ + 12 - 8 $x_2$ + 12 e rachloride e liquid phas	x <sub>2</sub> <sup>2</sup> ) e
$\ln f_2$	$= F$ $= f_{1} = f_{2} = x$ $x_{1} = f_{2} = x$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x_1^$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} + C x_{2}^{2}(1) \\ x_{2} + C x_{1}^{2}(1) \\ t \text{ of methylamine} \\ t \text{ of carbon tet:} \\ thylamine in the } \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1$ + 12 - 8 $x_2$ + 12 e rachloride e liquid phas	x <sub>2</sub> <sup>2</sup> ) e
$\ln f_2$	$= F$ $= f_{1} = f_{2} = x$ $x_{1} = f_{2} = x$	253.15 263.15 273.15 283.15 293.15 $x_2^2 - x_1^2 + x_1^$	0.650 0.630 0.587 0.563 0.524 B $x_2^2(1 - 4 + 3)$ B $x_1^2(1 - 4 + 3)$ y coefficient y coefficient	$\begin{array}{r} -0.085 \\ -0.071 \\ -0.051 \\ -0.036 \\ -0.030 \end{array}$ $\begin{array}{r} x_{1} + C x_{2}^{2}(1) \\ x_{2} + C x_{1}^{2}(1) \\ t \text{ of methylamine} \\ t \text{ of carbon tet:} \\ thylamine in the } \end{array}$	0.051 0.027 0.023 0.025 0.025 - 8 $x_1$ + 12 - 8 $x_2$ + 12 e rachloride e liquid phas	x <sub>2</sub> <sup>2</sup> ) e

COMPONENTS:			ORIGINAL MEASUREMENTS:		
1. Metha	namine, (methy	lamine);	Gerrard, W.		
CH <sub>5</sub> N;	[74-89-5]		Solubility of Gases.and Liquids,		
2. Bromo [108-	benzene; $C_6H_5H_6$	Br;	<i>Plenum</i> , <u>1976</u> , Chapter 10.		
	00-13		,		
VARIABLES:			PREPARED BY:		
	Pressure		C. L. Young		
EXPERIMENTA	L VALUES:				
			Mole fraction of methylamine		
т/к	T/K P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquiā,		
			<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
283.15	100 200	0.133 0.267	0.055 0.105		
	300	0.400	0.158		
	400 500	0.533 0.667	0.212 0.270		
	600 700	0.800 0.933	0.333 0.404		
	760	1.013	0.454		
		AUXILIARY	INFORMATION		
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
		a known weight	1. British Drug Houses or Cambrian		
of pure 1 total pre	iquid in a but ssure measured	bler tube at a by a manometer			
	The amount of stimated by we		2. Purified and attested by conventional procedures.		
	re was manuall		-		
The appar	atus and proce				
described	by Gerrard []	.,2].			
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES: 1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
1. Methar [74-	namine (Methy -89-5]	lamine); CH <sub>5</sub> N;	Gerrard, W. Solubility of Gases and Liquids,		
2. 1-Bron	no-3-methylbe	nzene			
	omotoluene);		<i>Plenum</i> <u>1976</u> , Chapter 10.		
[90-40	0-01				
VARIABLES:			PREPARED BY:		
	Drogguro				
	Pressure		C. L. Young		
EXPERIMENTAL	L VALUES:				
			Mole fraction of methylamine in liquid,		
Т/К	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>		
283.15	100	0 133			
203.13	100 200	0.133 0.267	0.044 0.089		
	300 400	0.400 0.533	0.136 0.185		
	500	0.667	0.235		
	600 700	0.800 0.933	0.288 0.350		
	760	1.013	0.395		
4 -					
		AUXILIARY	INFORMATION		
METHOD/APPA	RATUS / PROCEDURE :	:	SOURCE AND PURITY OF MATERIALS:		
		a known weight	1. British Drug Houses or Cambrian		
		ubbler tube at a ed by a manomete:			
assembly.	The amount	of absorbed	2. Purified and attested by		
	stimated by w re was manual	veighing. The Lly controlled	conventional procedures.		
to within	0.2K. atus and proc	- Jedure are			
described	by Gerrard	[1,2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol.<u>1972</u>, 22</pre>		
			623-650		
			2. Gerrard, W. Solubility of Gases and Liquids, Plenum Press, New York. <u>1976</u> . Chapter 1.		
L					

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COMPONENTS:			ORIGINAL MEASUREMENTS:	
	ne (methylamine); CH	H <sub>5</sub> N;	Gerrard, W.	
[74-89-5] 2. 1-Bromona [90-11-9]	phthalene; C <sub>10</sub> H <sub>7</sub> Br;		Solubility of Gases and Liquids, Plenum, <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL VA	LUES:	<u> </u>	······································	
т/к	P/mmHg	P/10 <sup>5</sup> 1	Mole fraction of methylamine Pa in liquid, <sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>	
283.15	100	0.13	3 0.048	
	200	0.26	7 0.095	
	300	0.400	0 0.144	
	400	0.53	3 0.191	
	500	0.66	7 0.242	
	600	0.80	0 0.295	
	700	0.93	3 0.356	
	760	1.01	3 0.397	
	AUXI	LIARY	INFORMATION	
METHOD APPARATU	S/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
of pure liqu a total press manometer as	ssed into a known wei id in a bubbler tube sure measured by a sembly. The amount	at	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> </ol>	
weighing.	was estimated by The temperature was trolled to within 0.2	ĸ		
	s and procedure are			
	Gerrard (1,2).		ESTIMATED ERROR:	
reserred by			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler).	
			(Estimated by compitel).	
			REFERENCES: 1. Gerrard, W. <i>J. Appl. Chem. Biotechnol.</i> <u>1972</u> , 22, 623-650. 2. Gerrard, W.	
			2. Gerfald, W. Solubility of Gases and Liquids, Plenum Press, New York. <u>1976</u> , Chapter 1.	

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		wethandhin	
COMPONENTS	:		ORIGINAL MEASUREMENTS:
	anamine (Methyla 74-89-5]	mine); CH <sub>5</sub> N;	Gerrard, W.
-	-Trichloroethan	ol.	Solubility of Gases and Liquids,
()	L,1,1-trichloro-	-2-hydroxy-	Plenum 1976, Chapter 10.
	thane); C <sub>2</sub> H <sub>3</sub> C	L <sub>3</sub> O;	12070 1376, Chapter 10.
[]	L15-20-8]		
VARIABLES	•		PREPARED BY:
Ten	mperature, press	sure	C. L. Young .
EXPERIMENT	TAL VALUES:		Mole fraction of methylamine
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
			<sup>x</sup> CH <sub>3</sub> NH <sub>2</sub>
273.15	100	0.133	0.524
273.13	200	0.267	0.581
	300	0.400	0.628
	400	0.533 0.667	0.676 0.722
	500 600	0.800	0.766
	700	0.933	0.815
270 15	760	1.013	0.848 0.760
278.15	700 760	0.933 1.013	0.781
283.15	100	0.133	0.494
	200	0.267	0.552
	300 400	0.400 0.533	0.588 0.624
	500	0.667	0.655
	600	0.800	0.683
	700	0.933	0.710 0.723
293.15	760 100	1.013 0.133	0.464
200.10	200	0.267	0.515
	300	0.400	0.548
	400 500	0.533 0.667	0.576 0.600
	600	0.800	0.622
	700	0.933	0.642
	760	1.013	0.653
		AUXILIARY	INFORMATION
METHOD/API	PARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS;
Amine wa	s passed into a	known weight	1. British Drug Houses or Cambrian
of pure	liquid in a bub	bler tube at a	Gases sample.
	essure measured		2 Duvisial and attacted by
assembly	<ul> <li>The amount o estimated by we</li> </ul>		2. Purified and attested by conventional procedures.
temperat	ure was manuall	y controlled	
to withi	n 0.2K.		
	ratus and proce		
describe	d by Gerrard [1	, 2] •	
			ESTIMATED ERROR:
			$\delta T/K = \frac{1}{2} 0.1;  \delta x/x = \frac{1}{2} 3$
			(estimated by compiler)
ł			DEFEDENCUE,
			REFERENCES:
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22
			623-650.
			2. Gerrard, W.
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> .
			Chapter 1.

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COMPONENTS: ORIGINAL MEASUREMENTS:						
			Wolff, H.; Höppel, HE.			
-	lmethanamine,		1			
(dimethy	ylamine); C <sub>2</sub> H <sub>7</sub> N	N; [124-40-3]		s. Phys. Chem.	•	
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [110-54	4-3]	<u>1966</u> , 70,874-	883.		
	0 14					
		·····		·····		
VARIABLES:			PREPARED BY:			
Compo	osition, temper	rature	P.	G. T. Fogg		
EXPERIMENTAL V	VALUES:					
Varia	ation of the t	otal vapor pr	essure/Torr wit	h variation o	£	
temperat	ure and of mole	e fraction of	$C_2^{H}7^{N}$ in the 1	iquid phase,	<sup>x</sup> C_H_N	
					21	
			T/K			
<i>x</i>	000 15	222 15	252 15	273.15	202.15	
<sup><i>x</i></sup> с <sub>2</sub> н <sub>7</sub> <sup>N</sup>	223.15	233.15	253.15	2/3.15	293.15	
		3.8	14.3	45.4	101 0	
0.0126	2.2 3.6	5.8	23.7	66.0	121.0 159.8	
0.0315	5.9	11.2	36.0	92.2	198.7	
0.0498 0.0714	7.7 9.7	14.8 18.2	45.7 53.8	110.0 131.9	239.7 282.3	
0.0860	10.3	20.3	59.8	147.3	314.0	
0.1005	11.7	22.5	65.9	161.3	341.2	
0.142 0.196	14.2 16.5	26.4 ´ 31.4	80.0 96.2	191.4 234.7	402.3 497.2	
0.214	17.3	32.8	102.3	247.5	525.2	
0.262 0.325	18.4 20.0	36.1 39.6	114.8 124.8	278.3 315.0	590.4 682.3	
0.375	21.1	41.7	133.9	340.8	739.6	
0.450	22.6	44.6	144.2	373.0	818.2	
0.512 0.587	23.5 24.5	46.4 48.9	152.3 160.0	397.3 424.4	879.5 948.9	
0.643	25.2	50.3	166.7	443.7	992.0	
				(	Cont.	
	<u> </u>	AUXILIARY	INFORMATION			
	TUS/PROCEDURE:		.~			
METHOD (APPAKA)	IUS/PROCEDURE:		SOURCE AND PURITY	OF MATERIALS:		
	described prev:		1. Vacuum dist		checked	
	Liquid mixture known composit		<pre>by i.r. spectrometry. 2. Supplied by FLUKA; purity 99.96 mol %.</pre>			
	into a cell he					
	controlled to					
	vapor pressure: y a mercury man					
-						
	s calculated ac					
the vapor p	coefficients of each component from the vapor pressure data by a method					
described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported. The compositions of			ESTIMATED ERROR:			
			$\delta T/K = \pm 0.02$	(estimated by	authors)	
				-		
	the vapor phase were also calculated by the authors.					
				Höpfner, A. Z.	Floktno	
			chem. 1962,	66, 149.		
			2. Barker, J.A	. Aust. J. Che	em. <u>1953</u> ,	
			6, 207. 3. Redlich, O.	; Kister, A.T.	Ind. Enc.	
			Chem. <u>1948</u> ,	21, 345.		
	h		· · · · · · · · · · · · · · · · · · ·			

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COMPONENTS:			ORIGINAL MEASURE	MENTS:		
	'lmethanamine, ylamine); C <sub>2</sub> H <sub>7</sub> N	; [124-40-3]		Noppel, HE. nes. Phys. Chem.		
	C <sub>6</sub> H <sub>14</sub> ; [110-54		<u>1966</u> , 70, 874-883.			
VARIABLES:			PREPARED BY:	<u></u>		
Compo	osition, tempera	ature	Ρ.	G. T. Fogg		
EXPERIMENTAL	VALUES: Cont.		<u></u>	<u> </u>	<u> </u>	
			T/K			
<sup><i>x</i></sup> C <sub>2</sub> <sup>H</sup> 7 <sup>N</sup>	223.15	233.15	253.15	273.15	293.15	
0.692	25.7 26.3	51.8 52.7	171.0 178.3	458.5 478.0	1030.9	
0.830	27.0	54.3	184.8	494.7	1120.	
0.867 0.932	27.4 28.2	55.3 57.5	188.5 197.0	506.5 528.5	1156. 1201.	
0.956	28.6	58.6	201.0	537.8	1222.	
1	29.0	60.6	206.5	562.9	1271.	
Constant.	s for calculati Redlich T/K		B			
	223.15	1.496	0.149	0.216		
	233.15 243.15	1.385 1.304	0.065 0.061	0.159 0.118		
	253.15	1.192	0.069	0.111		
	263.15 273.15	1.092 0.965	0.122 0.082	0.111 0.096		
	283.15	0.901	0.116	0.086		
	293.15	0.811	0.133	0.103		
$\ln f_1$	$= A x_2^2 - B$	$x_2^2 (1 - 4 x_1)$	) + $C x_2^2 (1)$	$-8x_1 + 12x_1$	<sup>2</sup> )	
$\ln f_2$	$= A x_1^2 + B$	$x_1^2(1 - 4 x_2)$	$(1) + C x_1^2 (1)$	$-8x_{2}+12x_{2}$	<sup>2</sup> )	
: :	$f_1 = activity control f_2 = activity control f_2 = activity control f_2 = mole fract. f_1 = mole fract.f_2 = mole fract.$	oefficient of ion of dimeth	hexane Nylamine in the	e liquid phase		
meas	authors, in a surements on the cise than measure	e same system	which they co	onsidered to be	more	

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(dimethyl [124-40-3	anamine,			ORIGINAL MEAS	UREMENTS:		
(dimethyl [124-40-3	anamine,	MPONENTS:					
<pre>1. N-Methylmethanamine, (dimethylamine); C2<sup>H</sup>7<sup>N</sup>; [124-40-3] 2. Hexane; C6<sup>H</sup>14; [110-54-3]</pre>				Wolff, H., J. Phys. ( <u>1970</u> , 74,	Chem.		
L							
VARIABLES:				PREPARED BY:			
Compositi	on, tempe	rature			P. G. T.	Fogg	
EXPERIMENTAL VALUES	:						
Variation temperature a	of the t nd of mol	otal va e fract	por pr ion of	essure/Torr <sup>C</sup> 2 <sup>H</sup> 7 <sup>N</sup> in tl	with var: he liquid	iation of phase, <i>x</i>	с <sub>2</sub> н <sub>7</sub> и
				T/K			
<sup>x</sup> C <sub>2</sub> H <sub>7</sub> N 223.15	233.15	243.15	253.1	5 263.15	273.15	283.15	293.15
0.1014 12.8 0.1508 15.3 0.2008 17.3 0.2707 19.6 0.2720 19.6 0.4031 21.9 0.6022 24.3 0.7157 25.7 1.0 30.3	9.0 19.1 23.2 29.1 33.2 37.6 37.7 43.2 49.4 52.4	15.9 33.4 41.5 51.8 59.9 68.6 68.8 79.6 92.1 98.8 117.4	27.4 55.2 68.7 98.8 116.5 117.2 137.7 162.1 174.2 208.9	87.5 108.4 136.1 160.8 187.7 188.3 224.9 268.2 289.4 349.8	73.3 133.5 164.9 206.5	113.5 198.2 243.1 303.5 360.7 428.3 430.4 522.7 644.0 704.0	121.3 171.6 285.9 347.7 428.8 512.4 612.0 615.0 750.0 939.9 1031.1 1276.9
		AUX	ILIARY	INFORMATION			
AUXILIARY METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressure was measured by a mercury manometer. The authors considered that these measurements were more precise than measurements on the same system which they had reported in an earlier paper (2). The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (3). Constants for Redlich-Kister equations (4) for activity coefficients were evaluated and reported.				until fi vapor pr 2. Research Petroleu Oklahoma ESTIMATED ERR δT/K = ± 0. REFERENCES: 1. Wolff, F chem. 19 2. Wolff, F	d from dim e; repeate irst and J cessures w n grade fr im Co., Ba a. OR: .02 (estim .02 (estim 	nethylamma edly frac- last frac- vithin 0.: com Phill: artlesvil: nated by a er, A. Z. 49. er, A. Ben 1966, 70, 5. J. Cher	tionated tions had 2 Torr. ips le, authors) <i>Elektro-</i> c. Bunsen- , 874. m. <u>1953</u> ,

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38	N-Methylmethanamine Solubilities				
COMPONENTS:	OMPONENTS:			ENTS:	
	lmethanamine,	IN.	Wolff, H.; W		
[124-	(dimethylamine); C <sub>2</sub> H <sub>7</sub> N; [124-40-3]			n.	
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [110-54	4-3]	1970, 74, 160	00-1606.	
	0 14				
EXPERIMENTAL '	VALUES:				
		sulation of a	activity coeffic	signts from the	
			ations given be		
	т/к	A	в	с	
	223.15 233.15	1.474 1.404	-0.059 +0.002	0.076 0.124	
	243.15 253.15	1.294 1.187	+0.002 +0.027	0.089 0.086	
	263.15	1.085	+0.035	0.055	
	273.15 283.15	0.989 0.892	+0.048 +0.045	0.057 0.050	
	293.15	0.794	+0.042	0.048	
	· · · · · · · · · · · · · · · · · · ·	<u></u>	2		
-	-	-		$-8 x_1 + 12 x_1^2$	
In $f_2$	$= A x_1^2 + B$	$x_1^2(1 - 4 x)$	$x_2$ ) + C $x_1^2$ (1	$-8 x_2 + 12 x_2^2$	
where $f =$	activity coeff	icient of di	methylamine		
+	activity coeff				
4			mine in the lid	quid phase	
			the liquid pha		

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COMPONENTS :		·	ORIGINAL MEASUREMENTS:
	ylmethanami: hylamine);		Gerrard, W.
[124-4		- 2 , ,	Solubility of Gases and Liquids,
2. Decane	; C <sub>10</sub> H <sub>22</sub> ;	[124-18-5]	<i>Plenum</i> , <u>1976</u> , Chapter 10.
VARIABLES:		<u></u>	PREPARED BY:
Пот	perature, p	ressure	C.L. Young
1610	peracure, p		0.11. 10ung
EXPERIMENTAL	VALUES:		
			Mole fraction of dimethylamine
'Г/К	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
			<sup><i>x</i></sup> (СН <sub>3</sub> ) <sub>2</sub> NH
283.15	100 200	0.133 0.267	0.068 0.140
	300	0.400	0.235
	400	0.533	0.338
	500 600	0.667 0.800	0.456 0.598
	700	0.933	0.755
	760	1.013	0.840
288.15 293.15	760	1.013	0.665
293.15	100 200	0.133 0.267	0.065 0.110
	300	0.400	0.168
	400	0.533	0.225
	500 600	0.667 0.800	0.288 0.352
	700	0.933	0.332
	760	1.013	0.501
298.15	760	1.013	0.390
	<u></u>	AUXILIARY	INFORMATION
METHOD /APPAR	ATUS/PROCEDURI	5:	SOURCE AND PURITY OF MATERIALS;
		a known weight	1. British Drug Houses or Cambrian
		ubbler tube at a ed by a manometer	
assembly.	The amount	of abosrbed	2. Purified and attested by
	stimated by		conventional procedures.
to within		lly controlled	
The appara	tus and pro		
described	by Gerrard	[1,2].	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W.
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:		
1 N-Moth	nylmethanamine				
	chylamine); C		Gerrard, W.		
[124-4		<b>,</b> , .	Solubility of Gases and Liquids,		
2. Aromat	zic hydrocarbo	ns	<i>Plenum</i> , <u>1976</u> , Chapter 10.		
VARIABLES:		······	PREPARED BY:		
Те	emperature, pr	essure	C. L. Young		
		· · · · · · · · · · · · · · · · · · ·			
EXPERIMENTAL			Mole fraction of dimethylamine in liquid,		
т/к	I/K P/mmHg P/10⁵Pa		x (CH <sub>3</sub> ) 2NH		
	B	enzene; C <sub>6</sub> H <sub>6</sub> ;	[71-43-2]		
293.15	760	1.013	0.541		
	Methylt	enzene (toluen	e); C7H8; [108-88-3]		
293.15	760	1.013	0.580		
			ene); $C_{0}H_{10}$ ; [108-38-3]		
283.15	100 200	0.133 0.267	0.070 0.157		
	300	0.400	0.262		
	400	0.533	0.382		
	500	0.667	0.517		
	600 700	0.800 0.933	0.651 0.790		
	760	1.013	0.862		
293.15	400	0.533	0.260		
	500	0.667	0.336		
	600	0.800	0.415		
	700 760	0.933 1.013	0.504 0.564		
		AUXILIARY	INFORMATION		
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
of pure li		bler tube at a	l. British Drug Houses or Cambrian Gases sample.		
	ssure measured The amount o	by a manometer	2. Purified and attested by		
	stimated by we		conventional procedures.		
	re was manuall				
to within		_			
	atus and proce by Gerrard [1				
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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		N-Methylmethana	imine Solubilities
COMPONENTS:			ORIGINAL MEASUREMENTS:
1. N-Methylmethanamine (dimethyl-			Gerrard, W.
<pre>amine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3] 2. 1,3,5-Trimethylbenzene (mesitylene); C<sub>9</sub>H<sub>12</sub>; [108-67-8]</pre>			Solubility of Gases and Liquids,
			<i>Plenum</i> , <u>1976</u> , Chapter 10.
VARIABLES: Pressure			PREPARED BY:
			C. L. Young
EXPERIMENTAL	L VALUES:		
			Mole fraction of dimethylamine
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
	· –		<sup><i>x</i></sup> (СН <sub>3</sub> ) <sub>2</sub> NH
293.15	100	0.133	0.060
	200 300	0.267 0.400	0.124 0.188
	400	0.533	0.255
	500 600	0.667 0.800	0.327 0.404
	700 760	0.933 1.013	0.492 0.549
· · · · · · · · · · · · · · · · · · ·		AUXILIARY	INFORMATION
METHOD/APPAI	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
mine was	passed into a	. known weight bler tube at a	1. British Drug Houses or Cambrian Gases sample.
otal pres	sure measured	by a manometer	-
gas was es emperatur o within		ighing. The y controlled	2. Purified and attested by conventional procedures.
	tus and proce by Gerrard []		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			01/1 2002, 02/2 200
			(estimated by compiler)

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COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. N-Methylmethanar (Dimethylamin [124-40-3]			, J.P.; Matous, J.;
2. Methanol; CH <sub>4</sub> O;	2. Methanol; CH <sub>4</sub> O; [67-56-1]		48.
VARIABLES:		PREPARED BY:	
Demperature			Dana
Temperature,	pressure	P. G. 1	. Fogg
EXPERIMENTAL VALUES:	- <u></u>		
т/к	<sup>p</sup> total <sup>/Torr</sup>	<sup>p</sup> C2 <sup>H7N/Torr*</sup>	<sup>∞</sup> C <sub>2</sub> H <sub>7</sub> N
293.2	744.5	734	0.669
	786.5	778	0.6945
	836.5 889.5	829 883	0.7205 0.7485
298.2	740	721	0.597
	766	748	0.616
	790	772	0.6285
	813 835	797 820	0.640 0.6455
	840	825	0.646
	862	848	0.655
303 3	884	870	0.660
303.2	744.5 788.5	712 758 -	0.542 0.5565
	836.5	808	0.572
313.2	748	671	0.4505
	791	718	0.4655
	841.5 891	774 830	0.4845 0.5065
			Cont.
	AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCED	URE:	SOURCE AND PURITY OF N	IATERIALS :
The total pressure was measured. The dimethylamine was a reacting weighed sa with standard sulpl	e solvent in three s vessels in series above each vessel absorption of estimated by amples of solutions nuric acid and	by FLUKA A.G.; with methylamin amine as impuri 2. Supplied by Lac distilled throu theoretical pla	hema, Brno; gh a 60 te column;
hydroxide solution.	back-titrating with standard sodium hydroxide solution.		0.7866; n <sub>D</sub> (25 <sup>o</sup> C)
The authors gave equations to calculate activity coefficients of dimethylamine and of methanol which were derived from the experimental data.		ESTIMATED ERROR:	
		REFERENCES:	· · · · · · · · · · · · · · · · · · ·
		1 Wightorlo T -	Linek J
		1. Wichterle, I.;	
ļ		Antoine Vapor P of Pure Compoun	ressure Constants ds.
		Academia, Pragu	
		<u> </u>	

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. N-Methylmethanamine,</pre>	Niepel, W.; Novak, J.P.; Matous, J.;
(dimethylamine);C2H7N;	Sobr, J.
[124-40-3]	Chem. Zvesti
2. Methanol; CH40; [67-56-1]	<u>1972</u> , 26, 44-48.

## EXPERIMENTAL VALUES: Cont.

\* The partial pressure of dimethylamine was calculated by the compiler by subtracting the partial pressure of the solvent from the total pressure. The compiler assumed that the partial pressure of methanol was equal, in each case, to the product of the vapor pressure of pure methanol, the mole fraction of methanol in the solution and the activity coefficient of methanol as calculated from the equation given. The vapor pressure of pure methanol was calculated by the compiler from an Antoine type equation using constants from other work (ref. (1)) quoted in the paper. (The compiler noted an error in a sign in the Antoine equation given.)

The authors gave the following equations for activity coefficients:

 $\log_{10} f_1 = x_2^2 [-0.9829 + 0.25 (3 x_1 - x_2)]$  $\log_{10} f_2 = x_1^2 [-0.9829 + 0.25 (x_1 - 3 x_2)]$ 

where 
$$f_1$$
 = activity coefficient of dimethylamine  
 $f_2$  = activity coefficient of methanol  
 $x_1$  = mole fraction of dimethylamine in the liquid phase  
 $x_2$  = mole fraction of methanol in the liquid phase

N-Methylmethanamine Solubilities

	/v-ivietitytittetitalia		
COMPONENTS:		ORIGINAL MEASUREMENTS:	
<pre>1. N-Methylmethanam     amine); C2<sup>H7</sup>N; [</pre>	ine , (Dimethyl- 124-40-3]	Sobr, J.	, J.P.; Matous, J.;
2. Ethanol, C <sub>2</sub> H <sub>6</sub> O;	[64-17-5]	Chem. Zvesti <u>1972</u> , 26 (1), 44-	-48.
VARIABLES:		PREPARED BY:	
Temperature, pressure		P. G. 1	. Fogg
EXPERIMENTAL VALUES:		<u></u>	
T/K	p <sub>total</sub> /Torr	<sup>p</sup> C2 <sup>H</sup> 7 <sup>N/Torr*</sup>	*C2 <sup>H</sup> 7 <sup>N</sup>
293.2	744 789 840	737 783 835	0.659 0.6835 0.7145 0.745
298.2	890 748 789.5 844.5	885 735 777 834	0.7415 0.5865 0.604 0.6305
303.2	902.5 748.5 789 841	893 727 769 822	0.6575 0.534 0.547 0.5665
313.2	894 747 787.5 842.5 889.5	876 693 736 795 844	0.5815 0.420 0.4335 0.4545 0.4705
	AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE: Dimethylamine from a cylinder was bubbled through the solvent in three thermostatted glass vessels in series. The total pressure above each vessel was measured. The absorption of dimethylamine was estimated by reacting weighed samples of solutions with standard sulphuric acid and back-titrating with standard sodium hydroxide solution.		by FLUKA A.G.; with methylami: amine as impur 2. Prepared from by azeotropic	a cylinder supplied at least 97% pure ne and trimethyl- ities. commercial ethanol distillation with ; density (25 <sup>0</sup> C)
calculate activity dimethylamine and o	The authors gave equations to calculate activity coefficients of dimethylamine and of ethanol which were derived from the experimental data.		
		REFERENCES:	
		Vapor Pressure	; Linek, J. Antoine Constants of Pure demia, Prague. <u>1971</u> .

CON	1PONENTS:	ORIGINAL MEASUREMENTS:
1	. N-Methylmethanamine (dimethylamine); C <sub>2</sub> H <sub>7</sub> N; [124-40-3]	Niepel, W.; Novak, J.P.; Matous, J.; Sobr, J. Chem. Zvesti
2	• Ethanol; C <sub>2</sub> H <sub>6</sub> O; [64-17-5]	<u>1972</u> , 26, 44-48.

## **EXPERIMENTAL VALUES:**

\* The partial pressure of dimethylamine was calculated by the compiler by subtracting the partial pressure of the solvent from the total pressure. The compiler assumed that the partial pressure of ethanol was equal, in each case, to the product of the vapor pressure of pure ethanol, the mole fraction of ethanol in the solution and the activity coefficient of ethanol as calculated from the equations given. The vapor pressure of pure ethanol was calculated from an Antoine type equation using constants from other work (ref. (1)) quoted in the paper. (The compiler noted an error in a sign in the Antoine equation given.)

The authors gave the following equations for activity coefficients:

 $\log_{10} f_1 = x_2^2 \left[-0.6691 + 0.13 \left(3 x_1 - x_2\right)\right]$  $\log_{10} f_2 = x_1^2 \left[ -0.6691 + 0.13 \left( x_1 - 3 x_2 \right) \right]$ 

where  $f_1$  = activity coefficient of dimethylamine

f, = activity coefficient of ethanol

 $x_1$  = mole fraction of dimethylamine in the liquid phase

 $x_2$  = mole fraction of ethanol in the liquid phase

COMPONENTS :		ORIGINAL MEASUREMENTS:	
<pre>1. N-Methylmethanamine, (Dimethylamine);C2H7N; [124-40-3]</pre>		Niepel, W.; Novak Sobr, J. Chem. Zvesti	, J.P.; Matous, J.;
2. 1-Propanol; C <sub>3</sub> H <sub>8</sub> C	); [71-23-8]	<u>1972</u> , <i>26</i> , 44-48.	
VADIADIEC.		PREPARED BY:	
VARIABLES: Temperature, pressure		P. G. T	. Fogg
EXPERIMENTAL VALUES:			
т/к	<sup>p</sup> total <sup>/Torr</sup>	<sup>p</sup> C2 <sup>H7N/Torr*</sup>	<sup><i>x</i></sup> с <sub>2</sub> н <sub>7</sub> м
293.2	744 796 845	742 794 844	0.6845 0.712 0.742
298.2	897 742 787 839	896 - 738 783 836	0.767 0.6045 0.628 0.652
303.2	891 746 796 841	888 739 790 835	0.6765 0.551 0.575 0.595
313.2	893 745 750 795 845	888 726 731 778 829	0.614 0.4475 0.451 0.4745 0.4945
760 Torr = 1	atm = 1.013 x 10 <sup>5</sup>	Ра	Cont.
	AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCEDU	RE:	SOURCE AND PURITY OF M	ATERIALS:
Dimethylamine from a cylinder was bubbled through the solvent in three thermostatted glass vessels in series The total pressure above each vessel was measured. The absorption of dimethylamine was estimated by reacting weighed samples of solutions with standard sulphuric acid and back-titrating with standard sodium hydroxide solution.		<ol> <li>Obtained from a by FLUKA A.G.; with methylamin amine as impuri</li> <li>Supplied by Lac</li> </ol>	cylinder supplied at least 97% pure e and trimethyl- ties. hema, Brno; gh a 60 theoretical ensity (25°C)
The authors gave equations to calculate activity coefficients of dimethylamine and of propanol which were derived from the experimental data.		ESTIMATED ERROR:	
		REFERENCES :	
		l. Wichterle, I.; Antoine Vapor P of Pure Compoun	ressure Constants
		Academia, Pragu	e, <u>1971</u> .

	COMPONENTS :	ORIGINAL MEASUREMENTS:
	<pre>l. N-Methylmethanamine, (dimethylamine) C2<sup>H</sup>7<sup>N</sup>; [124-40-3]</pre>	Niepel, W.; Novak, J.P.; Matous, J.; Sobr, J.
	[124 40 5]	Chem. Zvesti
1	2. 1-Propanol; C <sub>3</sub> H <sub>8</sub> O; [71-23-8]	<u>1972</u> , 26, 44-48.

**EXPERIMENTAL VALUES:** Cont.

\* The partial pressure of dimethylamine was calculated by the compiler by subtracting the partial pressure of the solvent from the total pressure. The compiler assumed that the partial pressure of methanol was equal, in each case, to the product of the vapor pressure of pure propanol, the mole fraction of propanol in the solution and the activity coefficient of propanol as calculated from the equations given. The vapor pressure of pure propanol was calculated by the compiler from an Antoine type equation using constants from other work (1) quoted in the paper.

The authors gave the following equations for activity coefficients:

 $\log_{10} f_1 = x_2^2 \left[ -0.7397 + 0.05 \left( 3 x_1 - x_2 \right) \right]$  $\log_{10} f_2 = x_1^2 [-0.7397 + 0.05 (x_1 - 3 x_2)]$ 

where  $f_1$  = activity coefficient of dimethylamine = activity coefficient of 1-propanol  $f_2$ = mole fraction of dimethylamine in the liquid phase °°1 = mole fraction of 1-propanol in the liquid phase x2

	NENTS:			ORIGINAL MEASUREMENTS:
1. N	V-Methvlm	ethanamine	, (dimethyl-	Gerrard, W.
		$C_2H_7N;$ [		
2. 1.	-Octanol;	$C_{B}H_{1B}O;$	[111-87-5]	Solubility of Gases and Liquids,
	or			Plenum 1976, Chapter 10.
Τ.	-Butanoi	; C <sub>4</sub> H <sub>10</sub> O;	[/1-30-3]	
VARIABLES: Temperature, pressure				PREPARED BY:
			ure	C. L. Young
EXPER	RIMENTAL VA	LUES:		
				Mole fraction of dimethylamine
т/К		P/mmHq	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
		- /	-,10 14	<sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
			l-butanol	
293	.15	760	1.013	0.709
			1-octanol	
283.	.15	100	0.133	0.332
		200 300	0.267 0.400	0.442 0.530
		400	0.533	0.530
		500	0.667	0.696
		600	0.800	0.775
		700 760	0.933 1.013	0.848 0.894
293.	.15	100	0.133	0.261
		200	0.267	0.371
		300	0.400	0.455
		400 500	0.533 0.667	0.520 0.575
		600	0.800	0.634
		700	0.933	0.686
		760	1.013	0.719
		<u> </u>	AUXILIARY	INFORMATION
	OD /APPARATI			
METH	OD/14	US/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
Amin	e was pa	ssed into a	a known weight	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian
Amin of p	e was pa oure liqu	ssed into a id in a bub	a known weight bbler tube at a	l. British Drug Houses or Cambrian Gases sample.
Amin of p tota	e was pa oure liqu 1 pressu	ssed into a id in a bub re measured	a known weight bbler tube at a l by a manometer	l. British Drug Houses or Cambrian Gases sample.
Amin of p tota asse	e was pa oure liqu 1 pressu mbly. T	ssed into a id in a bub re measured he amount c	a known weight obler tube at a d by a manometer of absorbed	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas	e was pa oure liqu l pressu mbly. T was estin	ssed into a id in a bub re measured he amount c mated by we	a known weight obler tube at a d by a manometer of absorbed	l. British Drug Houses or Cambrian Gases sample.
Amin of p tota asse gas temp to w	e was par pure liqu l pressu mbly. T was estin perature y vithin 0.	ssed into a id in a bub re measured he amount c mated by we was manuall 2K.	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K.	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR:</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR: δT/K = ±0.1; δx/x = ±3% (estimated by compiler)</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR: δT/K = ±0.1; δx/x = ±3% (estimated by compiler)</li> <li>REFERENCES:</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR: δT/K = ±0.1; δx/x = ±3% (estimated by compiler)</li> <li>REFERENCES: 1. Gerrard, W.</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR: δT/K = ±0.1; δx/x = ±3% (estimated by compiler)</li> <li>REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR: δT/K = ±0.1; δx/x = ±3% (estimated by compiler)</li> <li>REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</li> <li>Gerrard, W.</li> </ol>
Amin of p tota asse gas temp to w The	e was pa oure liqu al pressu mbly. T was esti perature vithin 0. apparatu	ssed into a id in a bub re measured he amount c mated by we was manuall 2K. s and proce	a known weight obler tube at a l by a manometer of absorbed eighing. The Ly controlled edure are	1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.

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COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. N-Methylmethanamine			Gerrard, W.	
	thylamine); C			
[124-	40-3]		Solubility of Gases and Liquids,	
2. 1,2-Ethanediol (Ethylene glycol); $C_2H_6O_2$ ; [107-21-1]			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:	<u></u>	······································	PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL VALUES:			l	
ĺ			Mole fraction of dimethylamine in liquid,	
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) 2NH	
293.15	100 200	0.133 0.267	0.267 0.382	
	300	0.400 0.533	0.455 0.524	
	400 500	0.667	0.584	
	600 700	0.800 0.933	0.637 0.685	
	760	1.013	0.719	
		AUXILIARY	INFORMATION ·-	
METHOD/APPAR	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
of pure li	passed into a lquid in a bub!	bler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>	
assembly. gas was es temperatur to within The appara	The amount of stimated by we te was manually	ighing. The y controlled dure are	2. Purified and attested by conventional procedures.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

CONDONENTS			ORIGINAL MEASUREMENTS:
COMPONENTS: 1. N-Methylmethanamine			Gerrard, W.
(dimethylamine); C <sub>2</sub> H <sub>7</sub> N;			
[124-4			Solubility of Gases and Liquids,
<pre>2. 1,2,3-Propanetriol (Glycerol); C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>; [56-81-5]</pre>			Plenum 1976, Chapter 10.
UADTADI EC.			DDDDADUD DV.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES.		
EXPERIMENTAL	L VALUES:		
			Mole fraction of dimethylamine
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
-,	_ / •	,	(CH <sub>3</sub> ) <sub>2</sub> NH
293.15	100	0.133 0.267	0.300 0.430
	200 300	0.400	0.520
	400	0.533	0.584
	500 600	0.667 0.800	0.636 0.690
	700	0.933	0.736
	760	1.013	0.759
		AUXILIARY	INFORMATION
METHOD /APPA	RATUS / PROCEDURE :	AUXILIARY	
	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
Amine was of pure l:	passed into a iquid in a bub	known weight bler tube at a	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.
Amine was of pure 1: total pres	passed into a iquid in a bub ssure measured	known weight bler tube at a by a manomete:	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. r
Amine was of pure 1 total pres assembly. gas was es	passed into a iquid in a bub ssure measured The amount o stimated by we	known weight bler tube at a by a manomete: f abosrbed ighing. The	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.
Amine was of pure 1: total pres assembly. gas was es temperatus	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall	known weight bler tube at a by a manomete: f abosrbed ighing. The	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. r 2. Purified and attested by
Amine was of pure 1: total pres assembly. gas was es temperatus to within	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K.	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. r 2. Purified and attested by
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. r 2. Purified and attested by
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. r 2. Purified and attested by
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:
Amine was of pure 1: total pre: assembly. gas was es temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES:
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22
Amine was of pure 1: total pre: assembly. gas was es temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W.
Amine was of pure 1: total pres assembly. gas was en temperatur to within The appara	passed into a iquid in a bub ssure measured The amount o stimated by we re was manuall 0.2K. atus and proce	known weight bler tube at a by a manomete: f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.

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COMPONENTS:	ORIGINAL MEASUREMENTS:		
<pre>1. N-Methylmethanamine, (dimethylamine); C2<sup>H</sup>7<sup>N</sup>; [124-40-3]</pre>	Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S. J. Amer. Chem. Soc.		
2. 1,2,3-Propanetriol (glycerol); C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> ; [56-81-5]	<u>1941</u> , 63, 254-256.		
VARIABLES:	PREPARED BY:		
	P. G. T. Fogg		
EXPERIMENTAL VALUES:			
т/к <sup>р</sup> с <sub>2</sub> н <sub>7</sub> м	/mmHg* Mole fraction ${}^{x}C_{2}^{H}T_{N}$		
305.4 65	0.572		
760 mmHg = 1 atm = 1.013 x	10 <sup>5</sup> Pa.		
* The pressure of dimethylamine was said by the authors to correspond to its vapor pressure at 4.5°C. The magnitude of this pressure has been estimated by the compiler from vapor pressure data given in ref. (1).			
AUXILIARY	INFORMATION -		
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:		
The absorption apparatus was developed for studies of refrigerat- ion systems (ref. (2)) and consisted of a copper drum, 4 x 12 cm, fitted with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm <sup>3</sup> of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2°C. The drum was agitated and gaseous dimethylamine allowed to flow slowly into it. The final pressure in the drum corresponded to the vapor pressure of dimethylamine at 4.5°C. The magnitude of this pressure was not stated by the authors. The drum and contents were weighed again to find the weight of gas which had been absorbed.	The authors stated that the materials used were all purified carefully by chemical means and fractional distillation where feasible. ESTIMATED ERROR:		

COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>N-Methylmethanamine (dimethylamine); C2H7N;</li> </ol>	Gerrard, W.
[124-40-3]	Solubility of Gases and Liquids,
2. 1,4-Dioxane; C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> ; [123-9	1-1] Plenum 1976, Chapter 10.
VARIABLES:	
VARIADLED:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
	Mole fraction of dimethylamine
T/K <i>P</i> /mmHg <i>P</i> /10 <sup>5</sup> P	in liquid,
	a <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
293.15 760 1.013	0.549
M	
ş	
AUXI	LIARY INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Amine was passed into a known wei	
of pure liquid in a bubbler tube	at a Gases sample.
total pressure measured by a mano assembly. The amount of absorbed	
gas was estimated by weighing. T	he conventional procedures.
temperature was manually controll to within 0.2K.	ed
The apparatus and procedure are	
described by Gerrard [1,2].	
	ESTIMATED ERROR:
	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
	(estimated by compiler)
	REFERENCES:
	l. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22
	623-650.
	2. Gerrard, W.
	Solubility of Gases and Liquids. Flenum Press, New York. 1976.
1	Chapter 1.

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COMPONENTS:	<u></u>		ORIGINAL MEASUREMENTS:
	<pre>ylmethanamin hylamine);</pre>		Gerrard, W.
[124-4	0-3]		Solubility of Gases and Liquids,
2. Benzene C <sub>7</sub> H <sub>8</sub> (	emethanol (B O; [100-51-	enzyl alcohol); 6]	<i>Plenum</i> <u>1976</u> , Chapter 10.
VARIABLES:		· _ · · · · · · · · · · · · · · · · · ·	PREPARED BY:
Tempo	erature, pre	ssure	C. L. Young
EXPERIMENTAL	VALUES:	······································	
		r.	Mole fraction of dimethylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	<sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
283.15	100 200	0.133 0.267	0.388 0.486
	300	0.400	0.558
	400 500	0.533 0.667	0.625 0.696
	600	0.800	0.760
	700 760	0.933 1.013	0.830 0.875
288.15	760	1.013	0.783
293.15	100 200	0.133 0.267	0.340 0.422
	300	0.400	0.480
	400 500	0.533 0.667	0.536 0.587
	600	0.800	0.631
	700 760	0.933 1.013	0.675 0.705
	• • • • • • • • • • • • • • • • • • •	AUXILIARY	INFORMATION
METHOD APPARA	TUS / PROCEDURE :		SOURCE AND PURITY OF MATERIALS:
		a known weight	1. British Drug Houses or Cambrian
of pure lie	quid in a bul	obler tube at a	Gases sample.
total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			2. Purified and attested by conventional procedures.
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</pre>
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTS:			ORIGINAL MEASUREMENTS:
		(1)	Gerrard, W.
amine) [124-4	ylmethanamine ; C <sub>2</sub> H <sub>7</sub> N; 10-3]	(dimethyl-	Solubility of Gases and Liquids,
2. 1-Pher ketone	ylethanone (m ); C&H&O [	ethyl phenyl [98-86-2]	Plenum <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTA	L VALUES:		
			Vela function of dimethyloping
			Mole fraction of dimethylamine in liquid,
т/К	P/mmHg	<i>P</i> /10⁵Pa	$\infty$ (CH <sub>3</sub> ) <sub>2</sub> NH
293.15	100	0.133	0.068
	200 300	0.267 0.400	0.135 0.204
	400	0.533	0.276
	500 600	0.667 0.800	0.344 0.418
	700 760	0.933 1.013	0.500 0.559
	700	1.010	
· ·		AUXILIARY	INFORMATION
METHOD/APPA	RATUS/PROCEDURE:	· · · <del>.</del>	SOURCE AND PURITY OF MATERIALS:
Amine was	passed into a	a known weight bbler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>
total pre		d by a manometer	2. Purified and attested by
gas was e	stimated by w	eighing. The	conventional procedures.
temperatu: to within		ly controlled	
The appar	atus and proc by Gerrard []		
		1,4].	
	-	1,2].	
	-	.,2].	ESTIMATED ERROR:
	-	1,2].	ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
	-	L,2].	
		L, Z].	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
		L, Z].	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ % (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22
		L, Z].	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W.

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COMPONENTS:			ORIGINAL MEASUREMENTS:	
	ylmethanamine ( ; C <sub>2</sub> H <sub>7</sub> N; 0-31	dimethyl-	Gerrard, W. Solubility of Gases and Liquids,	
2. Ethoxy	benzene (ethyl; $C_8H_{10}O;$ [10]	phenyl 3-73-1]	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH	
293.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.067 0.136 0.206 0.278 0.350 0.423 0.502 0.554	
		AUXILIARY	INFORMATION	
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
of pure li total pres assembly. gas was es temperatur to within The appara	passed into a 1 quid in a bubbl sure measured h The amount of timated by weig e was manually 0.2K. tus and procedu by Gerrard [1,2	ler tube at a by a manometer absorbed ghing. The controlled are are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> </ol>	ı
			ESTIMATED ERROR:	<u>.                                    </u>
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	
			REFERENCES:	

COMPONENTS:	<u> </u>		ORIGINAL MEASUREMENTS:	
<ol> <li>N-Methylmethanamine (dimethylamine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3]</li> <li>Benzoic acid, ethyl ester (ethyl benzoate); C<sub>9</sub>H<sub>10</sub>O<sub>2</sub>; [93-89-0]</li> </ol>			Gerrard, W. Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10.	
VARIABLES:	·····		PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH	
293.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.072 0.146 0.218 0.291 0.367 0.442 0.523 0.572	
		AUXILIARY	INFORMATION	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	sure measured The amount of timated by we e was manually	bler tube at a by a manometer f absorbed ighing. The y controlled dure are	SOURCE AND FURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.	
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. N-Meth	nylmethanamine	(dimethy1-	Gerrard, W.	
amine) [124-4	$; C_{2}H_{7}N;$	_		
-	-	/ 1 /	Solubilities of Gases and Liquids,	
	$\begin{array}{l} \text{Dxybispentane} \\ \text{C}_{10}\text{H}_{22}\text{O}; \\ \text{S}_{5}-2 \end{array}$	(dipentyl	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
		· · · · · · · · · · · · · · · · · · ·		
EXPERIMENTAL	L VALUES:			
			Mole fraction of dimethylamine in liquid,	
т/к	P/mmHg	<i>P/</i> 10⁵Pa	$x^{\alpha}$ (CH <sub>3</sub> ) <sub>2</sub> NH	
293.15	100 200	0.133 0.267	0.080 0.160	
	300	0.400	0.240	
	400	0.533	0.318	
	500 600	0.667 0.800	0.397 0.477	
	700	0.933	0.554	
	760	1.013	0.596	
	,	AUXILIARY	INFORMATION	
METHOD/APPA	RATUS / PROCEDURE :		SOURCE AND PURITY OF MATERIALS:	
of pure 1	iquid in a bub	known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.	
assembly. gas was e	The amount of stimated by we re was manuall	eighing. The	2. Purified and attested by conventional procedures.	
The appara	atus and proce by Gerrard []			
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W.	
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

COMPONING	·····		
COMPONENTS:			ORIGINAL MEASUREMENTS:
	ylmethanamine ; C <sub>2</sub> H <sub>7</sub> ; 0-3]	(aimethyi-	Gerrard, W. Solubility of Gases and Liquids,
-	xybisoctane (	diocty]	Plenum 1976, Chapter 10.
	; C <sub>16</sub> H <sub>34</sub> O;	dioctyl	<i>i tenum</i> <u>1970</u> , chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	. VALUES:	<u>.</u>	
			Mole fraction of dimethylamine
		_	in liquid,
т/к	P/mmHg	<i>P</i> /10⁵Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH
293.15	100	0.133	0.090
2,55125	200	0.267	0.173 0.253
	300 400	0.400 0.533	0.330
	500	0.667	0.404 0.477
	600 700	0.800 0.933	0.559
	760	1.013	0.605
		AUXILIARY	INFORMATION
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure 1	iquid in a bul	a known weight obler tube at a	l. British Drug Houses or Cambrian Gases sample.
	ssure measured The amount d	l by a manometer of absorbed	2. Purified and attested by
gas was es	stimated by we	eighing. The ly controlled	conventional procedures.
to within	0.2K.	-	
	atus and proce by Gerrard []		
[			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650
			623-650. 2. Gerrard, W.
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
COMPONENTS:			ORIGINAL MEASUREMENTS:
	hylmethanamine ); C <sub>2</sub> H <sub>7</sub> N; 40-3]	(dimethyl-	Gerrard, W. Solubility of Gases and Liquids,
2. N,N-D	imethylformami	de; C <sub>3</sub> H <sub>7</sub> NO;	Plenum <u>1976</u> , Chapter 10.
[00-14	2-2]		
VARIABLES:			PREPARED BY:
Т	emperature, p	ressure	C. L. Young
EXPERIMENTAL	L VALUES:		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
283.15	100 200 300 400 500 600	0.133 0.267 0.400 0.533 0.667 0.800	0.066 0.155 0.255 0.364 0.490 0.625
288.15 293.15	700 760 200 300 400 500 600 700	0.933 1.013 1.013 0.267 0.400 0.533 0.667 0.800 0.933	0.766 0.848 0.686 0.102 0.160 0.221 0.294 0.375 0.461
298.15	760 760	1.013 1.013	0.511 0.412
		AUXILIARY	INFORMATION
METHOD ADDA	PATHE / PROCEDURE		
Amine was of pure 1: total pres assembly. gas was es temperatus to within The appara	iquid in a bub ssure measured The amount c stimated by we re was manuall	ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids, Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTS:			ORIGINAL MEASUREMENTS:
1. N-Met	hylmethanamine	2	Gerrard, W.
(dime	thylamine); (	2 <sub>2</sub> H <sub>7</sub> N;	Solubility of Gases and Liquids,
[124-40-3] 2. Pyridine; C₅H₅N; [110-86-1]			
or			Plenum 1976, Chapter 10.
Quino	line; C <sub>9</sub> H <sub>7</sub> N;	[91-22-5]	
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTA	L VALUES:		۸
			Mole fraction of dimethylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH
<u> </u>			
		Pyridine;	C5H5N; [110-86-1]
293.15	700	0.933	0.507
	760	1.013	0.564
		Quinoline;	$C_{9}H_{7}N;$ [91-22-5]
293.15	100	0.133	0.060
	200 300	0.267 0.400	0.126 0.191
	400	0.533	0.255
	500 600	0.667 0.800	0.322 0.394
	700 760	0.933	0.472 0.522
		AUXILIARY	INFORMATION
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
	passed into a	known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.
total pres	ssure measured	by a manometer	
	The amount o stimated by we		2. Purified and attested by conventional procedures.
temperatu	re was manaull		
to within The appara	0.2K. atus and proce	dure are	
	by Gerrard [1		
			ESTIMATED ERROR:
			$\delta T/K - \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			<ol> <li>Gerrard, W.</li> <li>Solubility of Gases and Liquids.</li> <li>Plenum Press, New York. <u>1976</u>.</li> <li>Chapter 1.</li> </ol>
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COMPONENTS:			ORIGINAL MEASUREMENTS:	
<pre>1. N-Methylmethanamine (dimethyl- amine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3]</pre>			Gerrard, W.	1
			Solubility of Gases and Liquids,	1
	obenzene; C <sub>6</sub> H 95-3]	5NO2;	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Deserves			
	Pressure		C. L. Young	
EXPERIMENTA	L VALUES:			
			Mole fraction of dimethylamine	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH	
293.15	100	0.133	0.053	
	200 300	0.267	0.110 0.169	
	400	0.533	0.233	
	500 600	0.667 0.800	0.300 0.375	
	700	0.933	0.456	
	760	1.013	0.506	
		AUXILIARY	INFORMATION -	
METHOD/APPA	RATUS / PROCEDURE :		SOURCE AND PURITY OF MATERIALS:	
		a known weight obler tube at a	1. British Drug Houses or Cambrian Gases sample.	1
	ssure measured The amount of	l by manometer	2. Purified and attested by	
gas was e	stimated by we	eighing. The	conventional procedures.	
t emperat to within		lly controlled	]	
The appar	atus and proce			
described	by Gerrard []	L, <b>Z</b> ] •		
			ESTIMATED ERROR:	
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES :	
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	
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COMPONENTS:			ORIGINAL MEASUREMENTS:
	hylmethanamine		Gerrard, W.
(dime) [124-	thylamine); C <sub>:</sub> 40-3]	2H7N;	Solubility of Gases and Liquids,
	namine (Aniline -53-3]	≥); C <sub>6</sub> H <sub>7</sub> N;	Plenum 1976, Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	L VALUES:		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
293.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.137 0.253 0.350 0.437 0.515 0.584 0.648 0.687
		AUXILIARY	INFORMATION
METHOD/APPA	RATUS/PROCEDURE:	· · · · · · · · · · · · · · · · · · ·	SOURCE AND PURITY OF MATERIALS:
of pure 1 total pre assembly. gas was e temperatu to within The appar	ssure measured The amount of stimated by we re was manually	bler tube at a by a manometer f absorbed ighing. The y controlled dure are	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> </ol>
			ESTIMATED ERROR:
			$\delta \mathbf{T}/\mathbf{K} = \pm 0.1;  \delta x/x = \pm 3 \mathbf{\hat{s}}$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids.
			Plenum Press, New York. 1976.

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				103
COMPONENTS:			ORIGINAL MEASUREMENTS:	
	ylmethanamine hylamine); C <sub>2</sub> H <sub>7</sub> 40-3]	N;	Gerrard, W. Solubility of Gases and Liquids,	
2. Benzon	itrile; C <sub>7</sub> H <sub>5</sub> N;	[100-47-0]	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:				
VARIABLES:			PREPARED BY:	
	Temperature, pres	ssure	C. L. Young	
EXPERIMENTAL	L VALUES:			
			Mole fraction of dimethylamine in liquid,	
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH	
			(Cf 3) 2NH	
283.15	100	0.133	0.100	
	200	0.267	0.200	
	300	0.400	0.310	
	400 500	0.533 0.667	0.424 0.540	
	600	0.800	0.660	
	700	0.933	0.780	
293.15	760 100	1.013 0.133	0.848 0.075	
233.13	200	0.267	0.150	
	300	0.400	0.224	
	400 500	0.533 0.667	0.296 0.368	
	600	0.800	0.443	
	700	0.933	0.524	
	760	1.013	0.576	
			INFORMATION	
		AUXILIARI	• · · · · · · · · · · · · · · · · · · ·	
	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
of pure li	passed into a kn iquid in a bubble	r tube at a	1. British Drug Houses or Cambrian Gases sample.	L
assembly. gas was es temperatur to within The appara	The amount of a stimated by weigh was manually c 0.2K. atus and procedur by Gerrard [1,2]	bosrbed ing. The ontrolled e are	2. Purified and attested by conventional procedures.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W.	
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

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COMPONENTS:	· · · · ·		ORIGINAL MEASUREMENTS:
	ylmethanamine	(dimethul-	Gerrard, W.
	; C <sub>2</sub> H <sub>7</sub> N;	(armetnyr-	Solubility of Gases and Liquids,
(o-nit	yl-2-nitroben		Plenum 1976, Chapter 10.
[88-72 VARIABLES:	2-2]		PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	L VALUES:		Mole fraction of dimethylamine
1		5	in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH
			0.000
293.15	100 200	0.133 0.267	0.060 0.117
	300 400	0.400 0.533	0.178 0.240
	500	0.667	0.303
	600 700	0.800 0.933	0.370 0.450
	760	1.013	0.505
		AUXILIARY	INFORMATION
METHOD/APPAI	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li		bler tube at a	l. British Drug Houses or Cambrian Gases sample.
	ssure measured The amount o	by a manometer f absorbed	2. Purified and attested by
gas was es	stimated by we	ighing. The	conventional procedures.
to within			
	tus and proce by Gerrard [1		
1			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
]			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

<u> </u>				105	
COMPONENTS:			ORIGINAL MEASUREMENTS:		
	hylmethanamin	e (dimethyl-	Gerrard, W. Solubility of Gases and Liquids,		
amine) [124-4	); C <sub>2</sub> H <sub>7</sub> N; 40-3]				
2. N-Methylbenzenamine (N-methyl- aniline); C <sub>7</sub> H <sub>9</sub> N; [100-61-8]			Plenum <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
	Pressure		C. L. Young		
	11035410				
EXPERIMENTAL	. VALUES:		• · · · · · · · · · · · · · · · · · · ·		
			Mole fraction of dimethylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
17K	r / muling	1/10 Fa	x (CH <sub>3</sub> ) <sub>2</sub> NH		
293.15	200 300	0.267 0.400	0.240 0.334		
	400	0.533	0.414 0.482		
	500 600	0.667 0.800	0.482		
	700 760	0.933 1.013	0.611 0.650		
	760	1.013	0.050		
		AUXILIARY	INFORMATION		
METHOD/APPAR	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
of pure li	lquid in a bub	a known weight obler tube at a	<ol> <li>British Drug Houses or Cambria Gases sample.</li> </ol>	n	
total pres assembly.		l by a manometer of absorbed	2. Purified and attested by		
gas was es	stimated by we	eighing. The	conventional procedures.		
temperatur to within		ly controlled			
The appara	tus and proce				
described	by Gerrard []	[,2].			
			、 、		
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES :		
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 2 623-650.	2	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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COMPONENTS:	. <u></u>		ORIGINAL MEASUREMENTS:
1. N-Met	hylmethanamine		Gerrard, W.
	thylamine); C	2H7N;	Solubility of Gases and Liquids,
2. Benzenemethanamine, (Benzylamine);			
C <sub>7</sub> H <sub>9</sub> N			· · · · · · · · · · · · · · · · · · ·
VARIABLES:			PREPARED BY:
Te	emperature, pre	essure	C. L. Young
EXPERIMENTA	L VALUES:		
чг∕к	P/mmHg	P/10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
283.15 293.15	760 100 200 300 400 500 600 700 760	1.013 0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.815 0.075 0.145 0.220 0.296 0.375 0.452 0.532 0.580
		ΔΙΙΥΤΙ ΤΔΟΥ	INFORMATION
METHOD ADDA	DATUS (PROCEDURE -		
METHOD/APPARATUS/PROCEDURE: Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler) REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976.

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COMPONENTS:			ORIGINAL MEASUREMENTS:	
<ol> <li>N-Methylmethanamine (dimethyl- amine); C<sub>2</sub>H<sub>7</sub>N; [124-40-3]</li> <li>N-Ethylbenzenamine (N-ethyl- aniline); C<sub>8</sub>H<sub>11</sub>N; [103-69-5]</li> </ol>			Gerrard, W. Solubility of Gases and Liquids,	
			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENT	AL VALUES:		L	
			Mole fraction of dimethylamine	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH	
293.15	200 300 400 500 600 700 760	0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.238 0.332 0.411 0.480 0.547 0.611 0.650	
METHOD/APPA		AUXILIARY	INFORMATION	<u></u>
of pure l	ARATUS/PROCEDURE:	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:	
total pre	passed into a iquid in a bubl	known weight oler tube at a	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	1
gas was e temperatu to within The appar	a passed into a iquid in a bubl ssure measured The amount of estimated by we are was manuall	known weight oler tube at a by a manometer f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	1
gas was e temperatu to within The appar	a passed into a iquid in a bubl ssure measured The amount of stimated by we ire was manually 0.2K. ratus and proces	known weight oler tube at a by a manometer f abosrbed ighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambriar Gases sample. 2. Purified and attested by	1
gas was e temperatu to within The appar	a passed into a iquid in a bubl ssure measured The amount of stimated by we ire was manually 0.2K. ratus and proces	known weight oler tube at a by a manometer f abosrbed ighing. The y controlled dure are	<ul> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> </ul>	

COMPONENTS:			ORIGINAL MEASUREMENTS:		
	hylmethanamine	a (dimethvl-	Gerrard, W.		
amine	$C_2H_7N;$ []	L24-40-3]			
2. <i>N</i> , <i>N</i> -E	Dimethylbenzena	amine	Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10.		
(N,N-	dimethylanilin 69-7]	ne); $C_{8}H_{11}N;$			
VARIABLES:			PREPARED BY:		
:	Temperature, p	ressure	C. L. Young		
EXPERIMENTA	L VALUES:	<u></u>			
			Mole fraction of dimethylamine		
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
	,		<sup><i>x</i></sup> (CH <sub>3</sub> ) <sub>2</sub> NH		
283.15	100	0.133	0.086		
	200 300	0.267 0.400	0.180 0.280		
	400	0.533	0.386		
	500	0.667	0.508		
	600 700	0.800 0.933	0.638 0.780		
	760	1.013	0.848		
293.15	100	0.133	0.061		
	200 300	0.267 0.400	0.127 0.192		
	400	0.533	0.257		
	500 600	0.667	0.330 0.404		
	700	0.800 0.933	0.485		
	760	1.013	0.538		
<del></del>		AUXILIARY	INFORMATION		
METHOD/APPAR	RATUS/PROCEDURE:	· ····	SOURCE AND PURITY OF MATERIALS:		
	passed into a iquid in a bub	known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.		
assembly. gas was es temperatur to within The appara	The amount o stimated by we re was manuall	ighing. The y controlled dure are	2. Purified and attested by conventional procedures.		
	-	·			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES: 1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

COMPONENTS :	······································		ORIGINAL MEASUREMENTS:		
	ylmethanamine		Gerrard, W.		
	ethylamine); -40-3]	$C_2H_7N;$	Solubility of Gases and Liquids,		
<pre>2. l-Octanamine (octylamine); C<sub>8</sub>H<sub>19</sub>N; [lll-86-4]</pre>			Plenum 1976, Chapter 10.		
VARIABLES:			PREPARED BY:		
			C. L. Young		
Te	mperature, pr	essure	C. L. Houng		
EXPERIMENTAL	VALUES:				
			Mole fraction of dimethylamine in liquid,		
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH		
283.15	100	0.133	0.120		
203.15	200	0.267	0.242		
	300 400	0.400 0.533	0.363 0.486		
	500	0.667	0.603		
	600 700	0.800 0.933	0.713 0.825		
	760	1.013	0.888		
293.15	100 200	0.133 0.267	0.093 0.183		
	300	0.400	0.266		
	400 500	0.533	0.347 0.428		
	600	0.667 0.800	0.506		
	700 760	0.933 1.013	0.583 0.626		
·			-		
		AUXILIARY	INFORMATION		
METHOD/APPAR.	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
of pure li	quid in a bub	known weight bler tube at a by a manometer	l. British Drug Houses or Cambrian Gases sample.		
assembly.	The amount o	f absorbed	2. Purified and attested by		
	timated by we e was manuall		conventional procedures.		
to within	0.2K.				
described	tus and proce by Gerrard [l	,2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			l. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

170		N-Methylmethana	imine Solubilities
COMPONENTS:	·····		ORIGINAL MEASUREMENTS:
	ylmethanamine		Gerrard, W.
	; C <sub>2</sub> H <sub>7</sub> N; []	-	Solubility of Gases and Liquids,
2. N,N-Di (N,N-d [91-66	ethylbenzenam liethylaniline [-7]	line e); C <sub>10</sub> H <sub>15</sub> N;	Plenum <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:		
			Mole fraction of dimethylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH
293.15	100	0.133	0.072
	200 300	0.267 0.400	0.141 0.211
	400	0.533	0.281
	500 600	0.667 0.800	0.354 0.429
	700 760	0.933 1.013	0.510 0.557
-			
		AUXILIARY	INFORMATION
METHOD/APPAI	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
		a known weight obler tube at a	l. British Drug Houses or Cambrian Gases sample.
of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1,

	1	v-wethylmethan	amine Solubilities		17
COMPONENTS:		- <u></u>	ORIGINAL MEASUREMENTS:		
<pre>1. N-Methylmethanamine, (dimethylamine); C2H7N; [124-40-3] 2. Tetrachloromethane (carbon tetrachloride); CCl4; [56-23-5]</pre>			Wolff, H.; H Ber. Bunsenge <u>1966</u> , 70, 87	es. Phys. Chem.	
VARIABLES:			PREPARED BY:		
Composition, temperature				G. T. Fogg	
EXPERIMENTAL VAL	UES:		L	— · · · · · · · · · · · · · · · · · · ·	
Variat: temperatu	ion of the t re and of mo	otal vapor pr le fraction o	essure/Torr wit f C <sub>2</sub> H <sub>7</sub> N in the	ch variation of liquid phase, <sup>x</sup> C	2 <sup>H</sup> 7 <sup>N</sup>
			T/K		
	<sup><i>x</i></sup> с <sub>2</sub> н <sub>7</sub> <sup>N</sup>	253.15	273.15	293.15	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			90.9 100.2 167.0 184.8 200.2 220.1 224.3 302.8 333.6 342.4 366.2 385.1 436.0 470.7 522.3 589.5 650.5 693.9 Cont.	
		AUXI LI ARY	INFORMATION		
METHOD APPARATUS	S/PROCEDURE:		SOURCE AND PURIT	Y OF MATERIALS:	
A modified version of apparatus described previously (1) was used. Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressures were measured by a mercury manometer but a sensitive quartz spiral manometer was used as a null instrument to prevent carbon tetrachloride vapour from coming into contact with mercury. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich- Kister equations (3) for activity coefficients were evaluated and reported. The compositions of the vapor phase were also calculated by the authors.			by i.r. spe 2. Purity check spectroscop ESTIMATED ERROR: $\delta T/K = \pm 0.02$ $\delta p/Torr = 1$ a	ked by i.r.	0.2
			<ol> <li>Wolff, H.; chem. 1962,</li> <li>Barker, J.A 6, 207.</li> </ol>	. Aust. J. Chem. ; Kister, A.T. I	<u>1953</u> ,

COMPONENTS:			ORIGINAL MEASUREMENTS:			
1. N-Methylmethanamine,			Wolff	Wolff, H.; Höppel, HE.		
(dime	ethylamine); C <sub>2</sub> F -40-3]	<sup>1</sup> 7 <sup>N</sup> ;	f		. Phys. Chem.	
			<u>1966</u> ,	70, 874-	883.	
2. Tetrachloromethane (carbon tetrachloride); CCl <sub>4</sub> ; [56-23-5]			5]			
EXPERIMENTAL	VALUES: Cont.		T/	Ϋ́K		
	<sup><i>x</i></sup> с <sub>2</sub> н <sub>7</sub> <sup>N</sup>	253.15	273	.15	293.15	
	0.608	126.9	343	.9	798.0	
	0.650 0.711	136.2 147.9	366 397		847.9 913.8	
	0.762	158.5	424	.9	980.2	
	0.810 0.861	168.9 178.8	451 480		1027.4 1094.2	
	0.910	189.5	504	. 4	1152.8	
	0.969 1	200.6 206.5	539 562		1227.8 1271.5	
	760 Torr =	1 atm = 1.	013 x 10 <sup>5</sup>	Pa		l
Constants	for calculation	n of activ equation	ity coeffi s given be	cients fr low.	om the Redlic	h-Kister
т/к	A	В	С	D	E	F
253.15	-0.001	-0.080	+0.129	-0.094	-	-
263.15	-0.005	-0.079	+0.119	-0.105	-	-
273.15	-0.024	-0.073	+0.031	-0.223	-	-
283.15	-0.015	-0.068	+0.058		-	-
293.15	+0.005	-0.031	+0.102	-0.173	-	-
293.15	+0.021	-0.096	+0.071	+0.133	+0.144	-0.517
$\ln f_{-} =$	$Ax_2^2 - Bx_2$	2(1 - 4x)	) + $C x_{2}$	$\frac{2}{(1 - 8x)}$	$1 + 12 x_1^2$	
	$- D x_2^2 (1 - 1)$				1 1	
	2	-	-	-	4	
	+ $E x_2^2 (1 - 1)$	+	+	*	-	5
	$-Fx_2^2(1-2)$	-	+	-	-	(1 <sup>°</sup> )
$\ln f_2 =$	$A x_1^2 + B x_1^2$	$(1 - 4 x_2)$	+ C $x_1$	(1 - 8 x)	$(2^{+12}x_2^{-2})$	
	+ $D x_1^2 (1 - 12)$	2 <sup>x</sup> 2 + 36 x	$x_2^2 - 32 x_2^2$	2 <sup>3</sup> )	-	
	+ $E x_1^2 (1 - 16)$	5 x <sub>2</sub> + 72 x	$2^{2} - 128$	$x_{2}^{3} + 80$	<sup>2</sup> <sup>4</sup> )	
	+ $F x_1^2 (1 - 2)$	$x_{2} + 120$	$x_2^2 - 320$	$x_{2}^{3} + 40$	$0 x_2^4 - 192 x$	2 <sup>5</sup> )
where $f_{-}$	= activity coe	<i>4</i>	-	-		
f_	= activity coe	efficient d	of carbon	tetrachlo	ride	
2 x-	= mole fraction	on of dimet	hylamine ·	in the lig	quid phase	
~1 *2	$x_1 =$ mole fraction of dimethylamine in the liquid phase $x_2 =$ mole fraction of carbon tetrachloride in the liquid phase					
Four cons case of 2	tants only were 93.2 K. In this cy than the use	evaluated s case the	for each use of si	temperatu	re except in	the

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COMPONENTS :			ORIGINAL MEASUREMENTS:		
		_	Gerrard, W.		
	hylmethanamine thylamine); (				
[124-4	40-3]		Solubility of Gases and Liquids,		
2. Cnlori	inated methane	es	Plenum, <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
	Pressure		C. L. Young		
EXPERIMENTA	L VALUES:				
			Mole fraction of dimethylamine		
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
			x (CH <sub>3</sub> ) <sub>2</sub> NH		
	<u> </u>		· · · · · · · · · · · · · · · · · · ·		
	Trichlorom	ethane (chlorofo	orm); CHCl <sub>3</sub> ; [67-66-3]		
293.15	600	0.800	0.610		
	700	0.933	0.672		
	760	1.013	0.708		
Т	etrachloromet	nane (carbon tet	rachloride); CCl <sub>4</sub> ; [56-23-5]		
293.15	700 760	0.933 1.013	0.550 0.596		
			-		
		AUXILIARY	INFORMATION -		
1	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
Amine was of pure 1	; passed into iquid in a bu	a known weight bbler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>		
total pre	ssure measure	d by a manomete:			
gas was e	The amount stimated by w	eighing. The	conventional procedures.		
temperatu to within		ly controlled			
The appar	atus and proc				
described	l by Gerrard [	1,2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES :		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter l.		

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174		/v-metnymetnana	
COMPONENTS:			ORIGINAL MEASUREMENTS:
amine);	C <sub>2</sub> H <sub>7</sub> N; [		Gerrard, W. Solubility of Gases and Liquids,
<pre>2. 2,2,2-Trichloroethanol (1,1,1- trichloro-2-hydroxyethane); C<sub>2</sub>H<sub>3</sub>Cl<sub>3</sub>O; [115-20-8]</pre>			Plenum <u>1976</u> , Chapter 10.
VARIABLES:		······	PREPARED BY:
Temper	cature, pres	sure	C. L. Young
EXPERIMENTAL	VALUES:		······································
т/к	P/mmHg	P/10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>20</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
283.15	100 200 300 400	0.133 0.267 0.400 0.533	0.518 0.588 0.644 0.690
	500 600 700 760	0.667 0.800 0.933 1.013	0.740 0.800 0.861 0.900
288.15 293.15	760 100 200 300 400	1.013 0.133 0.267 0.400	0.826 0.474 0.537 0.582 0.621
	400 500 600 700 760	0.533 0.667 0.800 0.933 1.013	0.621 0.658 0.695 0.733 0.756
298.15	760	1.013	0.706
			INFORMATION
	TUS/PROCEDURE		SOURCE AND PURITY OF MATERIALS:
of pure liq total press	uid in a bu sure measure	a known weight bbler tube at a d by a manometer	
assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			2. Purified and attested by conventional procedures.
			ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids.
			Plenum Press, New York. <u>1976</u> . Chapter 1.

N-Methylmethanamine Solubilities

COMPONENTS :		······	ORIGINAL MEASUREMENTS:
	Lmethanamine C <sub>2</sub> H <sub>7</sub> N; [12]	(dimethy1- 4-40-3]	Gerrard, W.
	enzene; C <sub>6</sub> H <sub>5</sub> C	1; [108-90-7]	Solubility of Gases and Liquids,
or Bromober or	nzene; C <sub>6</sub> H <sub>5</sub> Br	; [108-86-1]	Plenum, <u>1976</u> , Chapter 10.
	zene; $C_6H_5I;$	[591-50-4]	
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL V	ALUES:		<b>.</b>
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of dimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>2</sub> NH
		Benzene, chlor	ю-; C <sub>5</sub> H <sub>5</sub> Cl; [108-90-7]
293.15	600	0.800	0.429
	700 760	0.933 1.013	0.520 0.575
	780	1.013	0.375
		Benzene, bromo	-; C <sub>6</sub> H <sub>5</sub> Br; [108-86-1]
293.15	700 760	0.933 1.013	0.532 0.580
		Benzene, iodo-	; C <sub>s</sub> H <sub>s</sub> I; [591-50-4]
293.15	100	0.133	0.097
293.13	200	0.267	0.132
	300	0.400	0.203
	400 500	0.533 0.667	0.341 0.417
	600	0.800	0.495
	700 760	0.933 1.013	0.570 0.612
	780	1.013	0.012
			INFORMATION
	TUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
	assed into a uid in a bubb	known weight ler tube at a	1. British Drug Houses or Cambrian Gases sample.
		by a manometer	2. Purified and attested by
	The amount of imated by wei		conventional procedures.
temperature	was manually		
to within 0	.2K. us and proced	ure are	
	y Gerrard [1,		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976. Chapter 1.

COMPONENTS:	<u> </u>		ORIGINAL MEASUREMENTS:		
	ylmethanamine (		Gerrard, W.		
amine)	; $C_2H_7N$ ; [124	[-40-3]	Solubility of Gases and Liquids,		
<pre>2. l-Bromo-3-methylbenzene   (m-bromotoluene); C<sub>7</sub>H<sub>7</sub>Br;   [95-46-5]</pre>			Plenum 1976, Chapter 10.		
VARIABLES:			PREPARED BY:		
	Pressure		C. L. Young		
EXPERIMENTAL	. VALUES:				
			Mole fraction of dimethylamine in liquid,		
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) <sub>2</sub> NH		
283.15	100	0.133	0.065		
	200 300	0.267 0.400	0.132 0.203		
	400 500	0.533 0.667	0.275 0.349		
	600	0.800	0.428		
	700 760	0.933 1.013	0.510 0.563		
		AUXILIARY	INFORMATION		
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
	passed into a iquid in a bubb		l. British Drug House or Cambrian Gases sample.		
total pre	ssure measured	by a manometer			
gas was e	The amount of stimated by wei re was manually	lghing. The	2. Purified and attested by conventional procedures.		
The appar	atus and proced by Gerrard [1,				
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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COMPONENTS:			ORIGINAL MEASUREMENTS:
1. N-Meth	nylmethanamine ; C <sub>2</sub> H <sub>7</sub> N; [12	(dimethy1- 4-40-31	Gerrard, W.
			Solubility of Gases and Liquids
2. 1-Brom [90-1]	<pre>nonaphthalene; L-9]</pre>	$C_{10}H_7Br;$	Plenum 1976, Chapter 10.
VARIABLES:			PREPARED BY:
	_		
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:		
1.2.124	D (	D /1 0 5 D-	Mole fraction of dimethylamine in liquid,
т/к	P/mnHy	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) NH
			5.2
293.15	100 200	0.133 0.267	0.060 0.117
	300	0.400	0.175
	400 500	0.533 0.667	0.237 0.300
	600	0.800	0.368
	700 760	0.933	0.446
	760	1.013	0.500
		AUXILIARY	INFORMATION
METHOD/APPAI	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure 1:	passed into a iquid in a bubb	oler tube at a	1. British Drug Houses or Cambrian Gases sample.
assembly.	ssure measured The amount of	by a manometer E absorbed	2. Purified and attested by
gas was es	stimated by wei	ighing. The	conventional procedures.
to within			
	atus and proced		
acaci ined	by Gerrard [1,		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
2			REFERENCES :
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids.
			Plenum Press, New York. <u>1976</u> .

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	:		ORIGINAL MEASUREMENTS:	
(T)	Dimethylmethanamine cimethylamine); C <sub>3</sub> H 5-50-3]	, 9 <sup>N</sup> ;	Halban, H. Z. Phys. Chem.	
•	ne; C <sub>6</sub> H <sub>14</sub> ; [110-54-	3]	<u>1913</u> , 84, 129-159.	
VARIABLES:			PREPARED BY:	,
	Concentration		P. G. T. Fc	odd
EXPERIMENT	AL VALUES:		L	
т/к (	Concentration of C3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>°C</sup> 3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.0886	22.0	75.0	0.0115
	0.1661	41.1	75.0	0.0214
	0.1702	41.9	75.3	0.0219
			he density of the solve	
ref.		ion that di liquid phas	ssolution of gas caused e.	
ref. change	(1), on the assumpt e of volume of the	ion that di liquid phas	ssolution of gas caused e. INFORMATION	l negligible
ref. change METHOD/APP The part amine ak ions def measurec (2) & (3)	(1), on the assumpt. e of volume of the ARATUS/PROCEDURE: tial pressures of t pove solutions of c termined by titration d by a dynamic methor 3)). Mixtures of h	AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	A negligible ALS: From Kahlbaum; Jas dried with
ref. change METHOD/APP The part amine ak ions def measured (2) & (3) oxygen, sodium H passed f trimethy in the o hydroch changes	(1), on the assumpt. a of volume of the ARATUS/PROCEDURE: tial pressures of tr bove solutions of con- termined by titration d by a dynamic methon by a dynamic methon contained by electric produced by electric produced by electric by a dynamic method by a dynamic method	ion that di liquid phas AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from uctivity	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	A negligible TALS: From Kahlbaum; gas dried with as Propyljodid;
ref. change METHOD/APP The part amine ak ions def measured (2) & (3 oxygen, sodium h passed f trimethy in the o hydroch changes due to p acid. 5 oxygen o electrol barometh	(1), on the assumpt. a of volume of the ARATUS/PROCEDURE: tial pressures of t: by a dynamic method by a dyna dynamic method by a dynamic method by a dynamic method by a	AUXILIARY AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from uctivity ion of the ogen/ d by om the anges in a	<pre>ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f    reacted with KOH; g    NaOH. 2. Kahlbaum n-Hexan au    distilled over Ng;</pre>	A negligible TALS: From Kahlbaum; gas dried with as Propyljodid;
ref. change METHOD/APP The part amine ak ions def measured (2) & (2) oxygen, sodium H passed f trimethy in the o hydroch changes due to p acid. 5 oxygen o electrol barometh copper v cell fon partial were cal that equ between and that	(1), on the assumpt. a of volume of the ARATUS/PROCEDURE: tial pressures of tr pove solutions of cr termined by titration d by a dynamic methological termined by electron produced by electron hydroxide solution, through each solution,	ion that di liquid phas AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from uctivity ion of the ogen/ d by om the anges in a s with the thylamine imption lished solution during	<pre>ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum n-Hexan au distilled over Na; b.p. 67.85-68.10 C ESTIMATED ERROR: REFERENCES: 1. Dreisbach, R.R. Phy of Chemical Compoun A.C.S. Washington,</pre>	A negligible ALS: From Kahlbaum; Jas dried with As Propyljodid; (745 mmHg). Sical Properti As, Vol. 2, <u>1959</u> . Chem. <u>1900</u> , 25 eld, H. Z. Phys

COMPONENTS:			ORIGINAL MEASUREM	ENTS:	
[75-50	ethylmethanamir ethylamine); C <sub>3</sub> 0-3] C <sub>6</sub> H <sub>14</sub> ; [110-54	_	Wolff, H.: Wü Ber. Bunsenge <u>1968</u> , 72, 101	s. Phys. Chem.	
21	6-14, 1-10 0	]			
VARIABLES:			PREPARED BY:		
Compo	osition, temper	cature		G. T. Fogg	
EXPERIMENTAL V	ALUES:				
Var temperatu	riation of tota are and of mole	al vapor pres e fraction of	sure/Torr with C <sub>3</sub> H <sub>9</sub> N in the l	variation of iquid phase, :	<sup>°</sup> с <sub>3</sub> н <sub>9</sub> и
			T/K		-
<sup>ж</sup> с <sub>3</sub> н <sub>9</sub> м	223.15	233.15	253.15	273.15	293.15
0.0508	1.8 4.7	3.7 9.6	14.1 30.8	45.7 81.4	121.0 180.2
0.1048	8.6	15.9	46.9	117.2	260.3
0.131	10.2 12.5	18.7 22.7	54.7 64.0	134.7 154.7	293.9 330.9
0.188	13.5	24.4	69.9	168.7	360.3
0.200	15.4	27.1	76.8	182.5	383.6
0.254	18.5	32.8	92.1	216.7	450.6
0.302 0.343	21.2 23.2	38.1 41.9	106.3 117.0	249.2 274.7	514.2 567.1
0.422	27.4	49.6	138.1	322.1	659.3
0.474		54.9	152.3	355.0	727.2
0.513	30.7 32.1	57.6		375.5	770.7
0.560	35.4	62.3	173.6	405.0	829.0
0.601	37.0	66.7 71.4	185.8 198.9	433.5	887.9
0.654 0.703	40.0 42.2	71.4 76.3 80 8	212.3	464.4 493.2	950.7 1007.8
0.758	45.1	80.8	224.5	525.0	1076.4
				Co	ont.
		AUXILIARY	INFORMATION		
METHOD /APPARAT	TUS/PROCEDURE:		SOURCE AND PURITY	OF MATERIALS:	
used (1), ( accurately introduced thermostat The total v	lescribed previ 2). Liquid mi known composit into a cell he controlled to apor pressure by manometer.	xtures of ion were ld in a ± 0.02°C.	repeatedly first and l pressures w	monium chlorid fractionated u ast fractions hich differed mits of error	le; intil the had vapor by less
coefficient the vapor p	calculated ac s of each comp pressure data b y Barker (3).	onent from y a method	2. Fluka " <i>Rein</i> purity 99.9		
for Redlich evaluated a composition		ons (4) were The phase were	ESTIMATED ERROR: δT/K = ± 0.0	2 (estimated b	by authors)
			REFERENCES: 1. Wolff, H.; <i>chem.</i> <u>1962</u> , 2. Wolff, H.; <i>senges. Phy</i> 3. Barker, J.A <i>6</i> , 207. 4. Redlich, O.	66, 149. Höppel, HE. s. Chem. <u>1966</u> , . Aust. J. Che	Ber. Bun- 70, 874. em. <u>1953</u> ,
			Chem. 1948,		

COMPONENTS :		0	RIGINAL MEASUREM	ŒNTS:	
(trim [75-5)		<sup>1</sup> 9 <sup>N</sup> ;	Wolff, H.; W Ber. Bunseng <u>1968</u> , 72, 10	es. Phys. Chem.	
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [110-54-	•3]			
EXPERIMENTAL V	ALUES: Cont.	ł_			
			Т/К		
<sup>ж</sup> с <sub>3</sub> н <sub>9</sub> м	223.15	233.15	253.15	273.15	293.15
0.806	47.2	85.2	238.7	555.4	1173.6
0.886	51.1	90.6	253.0	591.6	1213.8
0.901 1	52.8 57.4	94.2 103.9	263.1 289.2	612.9 675.8	1259.5
	т/к	A	ions given be B	C	
	17K	A	B		
	223.15	0.257	0.060	+0.014	
	233.15 243.15	0.225 0.203	0.032 0.035	-0.022 -0.024	
	253.15	0.197	0.022	-0.001	
	263.15 273.15	0.173 0.145	0.027 0.018	-0.000 -0.006	
	283.15	0.121	0.003	-0.013	
	293.15	0.100	0.009	-0.013	
ln $f_1$	$= A x_2^2 - B$	$x_2^2 (1 - 4 x_1)$	$+ C x_2^2 (1)$	$-8x_1 + 12x_1^2$ )	
$\ln f_2$	$= A x_1^2 + B$	$x_1^2 (1 - 4 x_2)$	$+ c x_1^2 (1)$	$-8x_2 + 12x_2^2$	
where :	$f_1 = activity$	coefficient d	of trimethyla	mine	
	$f_2 = activity$				
:				the liquid phase	
:	$r_2^{\perp} = mole frac$	tion of hexa	ne in the liqu	uid phase	

COMPONENTS:		ODICINAL MELON	
<ol> <li>N, N-Dimethylmethanamine, (Trimethylamine); C<sub>3</sub>H<sub>9</sub>J [75-50-3]</li> <li>Heptane; C<sub>7</sub>H<sub>16</sub>; [142-82- 3. Cyclohexanone; C<sub>6</sub>H<sub>10</sub>O; [ Cyclopentanone; C<sub>5</sub>H<sub>8</sub>O; [ 3-Pentanone; C<sub>5</sub>H<sub>10</sub>O; [96- 2-Butanone; C<sub>4</sub>H<sub>8</sub>O; [78-9]</li> </ol>	5] 108-94-1] 120-92-3] -22-0]	ORIGINAL MEASUREMENT Wheeler, O.H.; Can. J. Chem. <u>1959</u> , 37, 1727 PREPARED BY: P. G	Levy, E.M.
EXPERIMENTAL VALUES:	Conc.of co /mol c	ompgnent 3 T/K	Henry's law constant H / (mmHg / ${}^xC_{3}H_{9}N$ )
Heptane	-	233.2 273.2	148 864
Heptane + cyclohexanone	1.0	233.2 273.2	111 814
Heptane + cyclopentanone	1.0	233.2 273.2	123 884
Heptane + 3-pentanone	1.0	233.2 273.2	133 908
Heptane + 2-butanone	1.0	233.2 273.2	138 944
	AUXILIARY	INFORMATION	
METHOD 'APPARATUS / PROCEDURE: The absorption vessel of kn was connected by narrow bor to a mercury manometer and to a storage vessel connect second manometer. The whol attached to a high-vacuum 1 10 cm <sup>3</sup> of liquid were intro the absorption vessel and r frozen and pumped to remove Trimethylamine was distille storage vessel and from the samples transferred to the vessel. The liquid was sti magnetic stirrer and the fi pressure in the absorption measured. The quantity of amine admitted to the absor vessel was calculated from of the storage vessel and t of pressure in this vessel. Allowance was made for the trimethylamine in the gas p the absorption vessel when quantity dissolved was calculated	the tubing by a tap and to a e was ine. oduced into repeatedly a air. ad into the re small absorption rred by a nal vessel trimethyl- ption the volume he change hase in the	<pre>dried over C gases remove 2. From Matheso distilled ov n<sub>D</sub>(20<sup>O</sup>C) 1.3 3. Eastman-Koda dried over C C<sub>6</sub>H<sub>10</sub>O: b.p. 155 C<sub>5</sub>H<sub>8</sub>O : b.p. 129 C<sub>5</sub>H<sub>10</sub>O: b.p. 101 C<sub>4</sub>H<sub>8</sub>O : b.p. 79</pre>	k white-label grade; aH <sub>2</sub> ; non-condensible d. n, Coleman, & Bell; er Na; b.p.98.3 <sup>°</sup> C;
	·		····

COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>N, N-Dimethylmethanamine, (Trimethylamine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3]</li> <li>Heptane; C<sub>7</sub>H<sub>16</sub>; [142-82-5]</li> <li>Cyclohexanone; C<sub>6</sub>H<sub>10</sub>O; [108-94-1] Cyclopentanone; C<sub>5</sub>H<sub>8</sub>O; [120-92-3]</li> <li>3-Pentanone; C<sub>5</sub>H<sub>10</sub>O; [96-22-0]</li> <li>2-Butanone; C<sub>4</sub>H<sub>8</sub>O; [78-93-3]</li> </ol>	Wheeler, O.H.; Levy, E.M. Can. J. Chem. <u>1959</u> , 37, 1727-1732.

## EXPERIMENTAL VALUES:

The authors gave two small scale graphs showing linear variations of  ${}^{x}{}_{C_{3}H_{9}N}$  with  ${}^{p}{}_{C_{3}H_{9}N}$  for all the systems. Experimental points were not marked on these graphs. The authors stated that measurements were made over a pressure range to  ${}^{p}{}_{C_{3}H_{9}N} = 160$  mmHg. The lines drawn on the graphs show a variation of pressure from a few mmHg to about 140 mmHg for all measurements at 0°C, from a few mmHg to about 70 mmHg for solutions in pure heptane at -40°C and from a few mmHg to about 50 mmHg for other solutions at -40°C.

The authors also gave a table of values of  ${}^{x}C_{3}H_{9}N$  for various values of  ${}^{p}C_{3}H_{9}N$  for the cyclohexanone-heptane mixture at  $O^{O}C$ , apparently to a maximum  ${}^{p}C_{3}H_{9}N$  of 17 mmHg. This data is inconsistent with other data in the paper and the compiler considers that the authors have confused mmHg with cmHg and that this has led to errors by a factor of 10.

COMPONENTS:			ORIGINAL MEASUREMENTS:
	methylmethan	amino	Gerrard, W.
(trime	thylamine);		
[75-50-	-		Solubility of Gases and Liquids,
2. Decane;	; C <sub>10</sub> H <sub>22</sub> ;	[124-18-5]	Plenum, <u>1976</u> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressur		C. L. Young
	1100001		c. D. Ioung
EXPERIMENTAL	VALUES:		
			Mole fraction of trimethylamine
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
-/ ~	-/	-, 20 - 2	x (CH <sub>3</sub> ) <sub>3</sub> N
283.15	100	0.133	0.108
	200 300	0.267 0.400	0.211 0.313
	400	0.533	0.416
	500	0.667	0.517
	600 700	0.800 0.933	0.624 0.728
	760	1.013	0.786
	- ·	. <u> </u>	
		د د	
			i
		AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE	:	SOURCE AND PURITY OF MATERIALS:
		a known weight	1. British Drug Houses or Cambrian
of pure lie	quid in a bu	bbler tube at a	Gases sample.
		d by a manometer of absorbed	2. Purified and attested by
gas was es	timated by w	eighing. The	conventional procedures.
temperature	e was manual	ly controlled	-
to within (	0.2K. tus and proc	edure are	
	by Gerrard [		
	-		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta s/s = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22
			623-650.
			2. Gerrard, W. Solubility of Gases and Liquids.
1			Plenum Press, New York. 1976.
			Chapter 1.

1. N,N <sup>.</sup>	'S:		ORIGINAL MEASUREMENTS:	
۱٬۰۰۰ و ۱۷ و ۱۷	Dimokharlanatik			
	-Dimethylmethanamine Trimethylamine); C <sub>3</sub> H		Halban, H.	
Ĺ	75-50-3]	9	Z. Phys. Chem.	
2. Ben	zene; C <sub>6</sub> H <sub>6</sub> ; [71-43-2]	1	<u>1913</u> , <i>84</i> ,129-159.	
VARIABLE		· · · · ·	PREPARED BY:	
	Concentration		P. G. T. Fo	
	Concentration		P. G. T. FO	999
EXPERIMEN	NTAL VALUES:			
т/к	Concentration of C3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>₽</sup> C <sub>3</sub> H <sub>9</sub> N <sup>∕mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.1621	27.8	108	0.0143
	0.1692	28.5	110	0.0149
	0,1901	32.9	108	0.0167
	0.1928	33.1	108	0.0169
			he density of the solve ssolution of gas caused	
ref.		lon that dis Liquid phase	ssolution of gas caused e.	
ref. chang	(1), on the assumpting of volume of the l	lon that dis Liquid phase	ssolution of gas caused a. INFORMATION	negligible
ref. chang METHOD/A The pan amine a ions de measure (2) & oxygen, sodium passed trimeth the gas	<pre>(1), on the assumpti ge of volume of the 1 PPARATUS/PROCEDURE: ctial pressures of tr above solutions of co etermined by titratic ed by a dynamic metho (3)). Mixtures of hy produced by electro hydroxide solution, through each solution ylamine. The trimet s stream was absorbed</pre>	AUXILIARY AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. rdrogen and olysis of were on of thylamine in in	<pre>ssolution of gas caused INFORMATION SOURCE AND PURITY OF MATER 1. Hydrated chloride reacted with KOH; NaOH. 2. From Kahlbaum; con thiophene; distill</pre>	IALS: from Kahlbaum; gas dried with tained no
ref. chang METHOD/A The pan amine a ions de measure (2) & oxygen, sodium passed trimeth the gas hydroch changes due to acid. oxygen electro baromet	(1), on the assumpting ge of volume of the in- prevention of the in- citial pressures of the above solutions of con- etermined by titratic ed by a dynamic mether (3)). Mixtures of hy produced by electron hydroxide solution, through each solution, through each solution in the trimet a stream was absorbed floric acid and estim in electrical condu- partial neutralisati	AUXILIARY AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. rdrogen and olysis of were on of chylamine in ated from activity on of the ogen/ by m the anges in a	<pre>ssolution of gas caused INFORMATION SOURCE AND PURITY OF MATER 1. Hydrated chloride reacted with KOH; NaOH. 2. From Kahlbaum; con thiophene; distill</pre>	IALS: from Kahlbaum; gas dried with tained no

.

COMPONENTS:	·		ORIGINAL MEASUREMENTS:
1. N,N-E	)imethylmethana	mine	Gerrard, W.
(trim [75-5	<pre>nethylamine); i0-31</pre>	C <sub>3</sub> H <sub>9</sub> N;	Solubility of Gases and Liquids,
	tic hydrocarbo	26	Plenum, <u>1976</u> , Chapter 10.
2. Aroma	ere nyurocarbo	15	<i>rtenum</i> , <u>1976</u> , Chapter 10.
VARIABLES:	<u> </u>		PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTA	L VALUES:		Mole fraction of trimethylamine
т/к	P/mmHg	<i>P/</i> 10⁵Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N
		Benzene; $C_6 H_6$	
283.15	700 760	0.933 1.013	0.69 0.74
			ne); C <sub>7</sub> H <sub>8</sub> ; [108-88-3]
283.15	700 760	0.933 1.013	0.718 0.768
	1,3-Dimethy		lene); $C_{8}H_{10}$ ; [108-38-3]
283.15	700 760	0.933 1.013	0.716 0.768
1	1,3,5-Trimethy	ylbenzene (mesi	tylene); C <sub>9</sub> H <sub>12</sub> ; [108-67-8]
283.15	100 200	0.133 0.267	0.096 0.192
	300 400	0.400 0.533	0.284 0.382
	500 600	0.667 0.800	0.488 0.600
	700	0.933	0.700
	760	1.013	0.756
		AUXILIARY	INFORMATION
METHOD /APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
J	passed into a	known weight	1. British Drug Houses or Cambrian
of pure 1:	iquid in a bubb ssure measured	ler tube at a	Gases sample.
assembly.	The amount of	absorbed	2. Purified and attested by
	stimated by wei re was manually		conventional procedures.
to within The appara	0.2K. atus and proced	ure are	
	by Gerrard [1,		
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids.
			Plenum Press, New York. 1976. Chapter 1.

COMPONENTS	S •	1	ORIGINAL MEASUREMENTS:	
1. N,N- ("	-Dimethylmethanamine, Frimethylamine); C <sub>3</sub> H <sub>c</sub>	N:	Halban, H.	
[7	75-50-3]	,	Z. Phys. Chem.	
2 Moth	anol: CH O: [67-56-]	11	<u>1913</u> , <i>84</i> , 129-159.	
z. Meth	nanol; CH <sub>4</sub> O; [67-56-]	. ]		
VARIABLES				
VARIADLES	·		PREPARED BY:	
	Concentration		P. G. T. Fo	gg
EXPERIMEN	TAL VALUES:			
т/к	Concentration of C <sub>3</sub> H <sub>9</sub> N in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm!</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>°°C3H9N</sup>
298.2	0.368	9.63	712	0.0148
	0.510	13.2	718	0.0204
	0.511	13.5	704	0.0204
cause	lated by the compile d negligible change ty of methanol given	of volume of	assumption that dissolu of the liquid phase, us L).	tion of gas ing the
cause	d negligible change	of volume of in ref. (1	of the liquid phase, us	tion of gas ing the
cause densi	d negligible change ty of methanol given	of volume of in ref. (1	of the liquid phase, us L). INFORMATION	ing the
cause densi METHOD/AP The par amine al ions de	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio	of volume of in ref. (1 AUXILIARY imethyl- ncentrat- n, were	of the liquid phase, us L).	ALS: rom Kahlbaum
cause densi METHOD/AP The par amine al ions de measure	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho	of volume of in ref. (1 AUXILIARY imethyl- ncentrat- n, were d (refs.	of the liquid phase, us L). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: rom Kahlbaum as dried with
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen,	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO.	ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were	of the liquid phase, us INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko	ing the ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimeth	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet	of volume of in ref. (1 AUXILIARY rimethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO.	ing the ALS: rom Kahlbaum as dried with hol I
METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium ) passed trimethy in the o hydroch	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO.	ing the ALS: rom Kahlbaum as dried with hol I
METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimethy in the o hydroch changes	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO.	ALS: rom Kahlbaum as dried with hol I
METHOD/AP The par amine ad ions de measure (2) & ( oxygen, sodium 1 passed trimeth in the hydroch changes due to acid.	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO.	ing the ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimethy in the hydroch changes due to acid.	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO. 65.3°C (752 mmHg).	ing the ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimeth in the hydroch changes due to acid. oxygen o electro baromet	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a	of the liquid phase, us ). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko distilled from CaO. 65.3°C (752 mmHg).	ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measure (2) & ( 0xygen, sodium 1 passed trimeth in the hydroch changes due to pacid. 0xygen electro baromet copper	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from ric pressure and chan voltameter in series	of volume of in ref. (1) AUXILIARY Timethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the	<pre>of the liquid phase, us t). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko. distilled from CaO. 65.3°C (752 mmHg). ESTIMATED ERROR:</pre>	ALS: rom Kahlbaum as dried with hol I
Cause densi METHOD/AP The par amine al ions de measuree (2) & ( 0xygen, sodium 1 passed trimeth in the hydroch changes due to pacid. 0xygen electro baromet copper cell for partial	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from ric pressure and chan voltameter in series r producing the gas. pressures of trimet	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the The hylamine	<pre>of the liquid phase, us t). INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko. distilled from CaO. 65.3°C (752 mmHg). ESTIMATED ERROR: REFERENCES: 1. Timmermans, J. Phys.</pre>	ALS: rom Kahlbaum as dried with hol I b.p. 64.3-
METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimeth in the hydroch changes due to acid. oxygen electro baromet copper cell for partial were ca	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from ric pressure and chan voltameter in series r producing the gas. pressures of trimet lculated on the assure	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the The hylamine mption	<pre>bf the liquid phase, us bf the liquid phase, us constants of Purity of MATERI NFORMATION SOURCE AND PURITY OF MATERI Hydrated chloride f reacted with KOH; g NaOH. NaOH. Kahlbaum methylalko distilled from CaO. 65.3°C (752 mmHg). ESTIMATED ERROR: REFERENCES: Timmermans, J. Phys- Constants of Pure 0: </pre>	ALS: rom Kahlbaum as dried with hol I b.p. 64.3- ico-Chemical rganic Compounds
Cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimethy in the changes due to acid. 1 oxygen electro baromet copper cell for partial were ca that equ	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from ric pressure and chan voltameter in seriess r producing the gas. pressures of trimet lculated on the assum uilibrium was establ trimethylamine in series	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the The hylamine mption ished olution	<pre>het liquid phase, us het liquid phase, us het liquid phase, us het liquid phase, us het liquid phase, us light liquid phase, us Source AND PURITY OF MATERI het liquid phase character Source AND PURITY OF MATERI het liquid phase character Source AND PURITY OF MATERI liquid phase character Source AND PURITY OF MATERI Source AND PURITY OF MATERIAL Source AND PURITY OF MATERI Source AND PURITY OF MATERIAL Source AND PUR</pre>	ing the ALS: rom Kahlbaum as dried with hol I b.p. 64.3- ico-Chemical rganic Compounds
cause densi METHOD/AP The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimethy in the changes due to acid. oxygen electro baromet copper cell for partial were ca that equ	d negligible change ty of methanol given PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratio d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio ylamine. The trimet gas stream was absor loric acid and estim in electrical condu partial neutralisati The volumes of hydro gas mixture produced lysis were found from ric pressure and chan voltameter in series r producing the gas. pressures of trimet lculated on the assun uilibrium was establ	of volume of in ref. (1) AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the The hylamine mption ished olution during	<pre>pf the liquid phase, us l). INFORMATION SOURCE AND PURITY OF MATERI I. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum methylalko. distilled from CaO. 65.3°C (752 mmHg). ESTIMATED ERROR: REFERENCES: 1. Timmermans, J. Phys- Constants of Pure O: Vol. 2, Elsevier, And </pre>	ALS: rom Kahlbaum as dried with hol I b.p. 64.3- ico-Chemical rganic Compounds nsterdam. <u>1965</u> Chem. <u>1900</u> ,

COMPONENTS:				
			ORIGINAL MEASUREMENTS:	
(Tr [75	imethylmethanamine, imethylamine); C <sub>3</sub> H <sub>5</sub> -50-3] ol; C <sub>2</sub> H <sub>6</sub> O; [557-75-	<sub>9</sub> ™;	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.	
VARIABLES:			PREPARED BY:	
	Concentration		P. G. T. Fo	pgg
EXPERIMENTA	L VALUES:			
	Concentration of 3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm1</sup>	Concentration of <sup>Hg</sup> C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>°C</sup> 3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.1914	7.62	467	0.0111
	0.299	11.8	472	0.0172
	0.299	11.7	474	0.0172
ref. (]		on that dis	e density of the solven ssolution of gas caused e.	
ref. (]	l), on the assumpti	on that dis liquid phase	ssolution of gas caused	
ref. (1 change METHOD/APPA The parti amine abo ions dete measured (2) & (3) oxygen, H sodium hy passed th trimethyl in the ga hydrochlo changes i	<pre>1), on the assumpti of volume of the 1 </pre>	AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. vdrogen and olysis of were on of chylamine bed in nated from activity	ssolution of gas caused	I negligible IALS: From Kahlbaum gas dried with distilled;

COMPONENTS	S:		ORIGINAL MEASUREMENTS:	
נ) []	-Dimethylmethanamine, Frimethylamine); C <sub>3</sub> H <sub>g</sub> 75-50-3]	, <sup>N</sup> ;	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.	
2. l-Pı	ropanol; C <sub>3</sub> H <sub>8</sub> O; [71-2	23-8]		
VARIABLES	:		PREPARED BY:	······································
	Concentration		P. G. T. Fc	pāā
EXPERIMEN	TAL VALUES:			
т/к	Concentration of C <sub>3</sub> H <sub>9</sub> N in solytion/ mol dm	<sup>p</sup> c <sub>3</sub> H <sub>9</sub> N/mm	Concentration of Hg C <sub>3</sub> H <sub>6</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>°C</sup> 3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.219	8.55	482	0.0162
	0.329	13.1	467	0.0241
	0.330	13.2	467	0.0242
ref.	ulated by the compile (1), on the assumpti ge of volume of the 1	on that di	he density of the solve ssolution of gas caused e.	nt given in negligible
ref.	(1), on the assumpti	on that di. iquid phas	ssolution of gas caused	nt given in I negligible
METHOD/AP The par amine a ions de measure (2) & ( oxygen, sodium passed trimeth in the hydroch	(1), on the assumpti	AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. drogen and olysis of were on of chylamine bed in mated from	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: Trom Kahlbaum; as dried with distilled;

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. N,N-Dimethylmethanamine  (trimethylamine); C<sub>3</sub>H<sub>9</sub>N;  [75-50-3]</pre>	Gerrard, W. Solubility of Gases and Liquids,
2. 1-Butanol; $C_{4}H_{10}O$ ; [71-36-3]	Plenum <u>1976</u> , Chapter 10.
VARIABLES:	PREPARED BY:
Temperature, pressure	C. L. Young
EXPERIMENTAL VALUES:	
T/K P/mmHg P/10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N
293.15 760 1.013 298.15 700 0.933 760 1.013	0.571 0.488 0.510
AUXILIARY	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K.	l. British Drug Houses or Cambrian Gases sample.
The apparatus and procedure are described by Gerrard [1,2].	

## N,N-Dimethylmethanamine

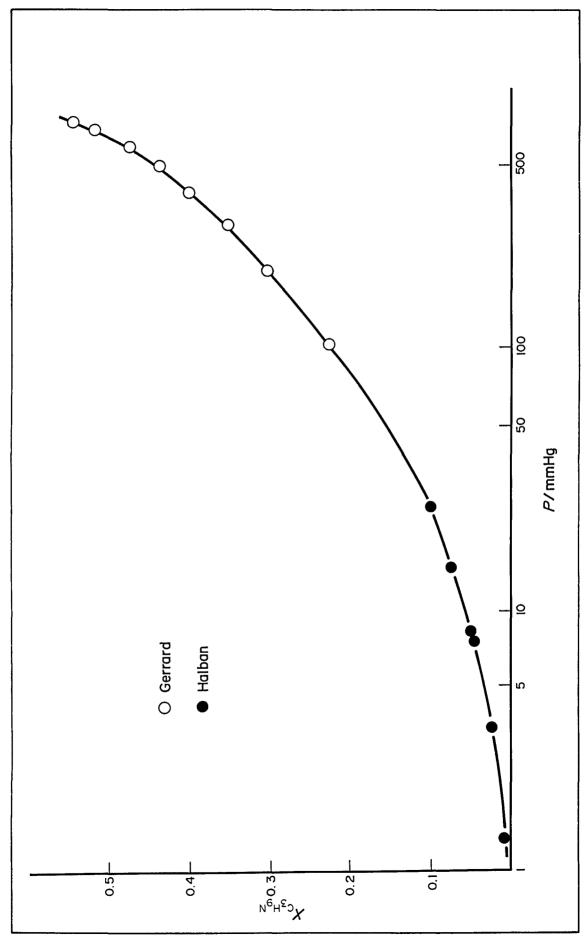
COMBONENT	PC 4	T	OBLCINAL MEACUDENENTS	
COMPONENT			ORIGINAL MEASUREMENTS:	
1. N,N	-Dimethylmethanamine,	N	Halban, H.	
(). []	Trimethylamine); C <sub>3</sub> H <sub>9</sub> M 75-50-31	N;	Z. Phys. Chem.	
-			<u>1913</u> , <i>84</i> , 129-159.	
2. 3-Me	ethyl-l-Butanol; C <sub>5</sub> H <sub>1</sub> 123-51-3]	2 <sup>0;</sup>		
L	123-31-3]			
VARIABLES	S:		PREPARED BY:	
	Concentration		P. G. T. Fo	aa
	0011001102482011			66
EXPERIMEN	NTAL VALUES:			
т/К	Concentration of C3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mmJ</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.342	16.3	390	0.0358
	0.346	16.9	382	0.0362
		16.9		
	0.347	T0.9	383	0.0363
ref.		on that dis	ne density of the solve ssolution of gas caused e.	
ref.	(1), on the assumption	on that dis iquid phase	ssolution of gas caused	
ref. chang	(1), on the assumption ge of volume of the li	on that dis iquid phase	ssolution of gas caused	negligible
ref. chang METHOD 'AN	(1), on the assumption ge of volume of the list	on that dis iquid phase AUXILIARY	ssolution of gas caused e.	negligible
ref. chang METHOD AN The par amine a	(1), on the assumption ge of volume of the lit PPARATUS/PROCEDURE: rtial pressures of tri above solutions of cor	on that dis iquid phase AUXILIARY imethyl- ncentrat-	SSOlution of gas caused INFORMATION SOURCE AND PURITY OF MATERI	negligible
ref. chang METHOD AN The pan amine a ions de	(1), on the assumption ge of volume of the lit PPARATUS/PROCEDURE: rtial pressures of tri above solutions of con etermined by titration	on that dis iquid phase AUXILIARY imethyl- ncentrat- n, were	INFORMATION SOURCE AND PURITY OF MATERI I. Hydrated chloride f reacted with KOH; g	negligible
ref. chang METHOD 'Al The par amine a ions de measure	(1), on the assumption ge of volume of the lit PPARATUS/PROCEDURE: rtial pressures of tri above solutions of cor	on that dis iquid phase AUXILIARY imethyl- ncentrat- n, were d (refs.	SSOlution of gas caused INFORMATION SOURCE AND PURITY OF MATERI	negligible
ref. chang METHOD 'AH The pau amine a ions de measure (2) & oxygen	<pre>(1), on the assumption ge of volume of the light PPARATUS/PROCEDURE: rtial pressures of tri above solutions of cor etermined by titration ed by a dynamic method (3)). Mixtures of hyd , produced by electrol</pre>	AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of	SSOLUTION OF GAS CAUSED INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum Amylalkoho	negligible ALS: rom Kahlbaum; as dried with
ref. chang METHOD 'AH The pau amine a ions de measure (2) & oxygen, sodium	<pre>(1), on the assumption ge of volume of the light PPARATUS/PROCEDURE: rtial pressures of tri above solutions of consistent of the solutions of consistent by titration ed by a dynamic method (3)). Mixtures of hyde</pre>	AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i>
ref. chang METHOD 'AI The par amine a ions de measure (2) & oxygen sodium passed trimeth	<pre>(1), on the assumption ge of volume of the light PPARATUS/PROCEDURE: rtial pressures of tri above solutions of correstermined by titration ed by a dynamic method (3)). Mixtures of hyd produced by electrol hydroxide solution, w through each solution nylamine. The trimeth </pre>	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD 'AI The pai amine a ions de measure (2) & oxygen, sodium passed trimeth in the	<pre>(1), on the assumption ge of volume of the light PPARATUS/PROCEDURE: rtial pressures of tri above solutions of constant of the distribution of the distributication of the distribution of the distrule of the distribution o</pre>	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were h of hylamine bed in	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD 'AI The par amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hyd (3)). Mixtures	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>Hydrated chloride f reacted with KOH; g NaOH.</li> <li>Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
METHOD 'AI METHOD 'AI The par amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes due to	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydroxide solution, we hydroxide solution, we through each solution mylamine. The trimeth gas stream was absort aloric acid and estimates in electrical conduct partial neutralisation	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity on of the	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>Hydrated chloride f reacted with KOH; g NaOH.</li> <li>Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD AI The par amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes due to acid. oxygen	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hyd (3)). Mixtures of hydro- hydroxide solution, we through each solution hydroxide solution, we through each solution mylamine. The trimeth gas stream was absort abloric acid and estimates in electrical conduct partial neutralisatic The volumes of hydroog gas mixture produced	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity on of the gen/ by	<ul> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD AI The par amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes due to acid. oxygen electro	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of com- etermined by titration ed by a dynamic method (3)). Mixtures of hydro (3)). Mixtures of hydro (3)). Mixtures of hydro (3)). Mixtures of hydro (3)). Mixture solution hydroxide solution, w through each solution hydroxide solution, w through each solution mylamine. The trimeth gas stream was absort aloric acid and estimates in electrical conduct partial neutralisation The volumes of hydroon gas mixture produced olysis were found from	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by n the	<ul> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD 'AI The pai amine a ions de measure (2) & coxygen changes due to acid. oxygen electro baromet copper	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydro (3)). Mixture solution, w through each solution, w through each solution hydroxide solution, w through each solution fully a stream was absort fully a st	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were h of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction
ref. chang METHOD 'AI The par amine a ions de measure (2) & (2) & sodium passed trimeth in the hydroch changes due to acid. oxygen electro baromet copper cell for	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydro (3)). Mixture solution, w through each solution hydroxide solution, w through each solution hydroxide solution, w through each solution fully a stream was absort for a cid and estimate in electrical conduce partial neutralisation the volumes of hydrog gas mixture produced olysis were found from tric pressure and char voltameter in series or producing the gas.	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by n the nges in a with the The	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction 1.0°C (752 mmHg)
ref. chang METHOD 'AI The par amine a ions de measure (2) & oxygen passed trimeth in the hydroch changes due to acid. oxygen electro baromet copper cell for partial	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydro (3)). Mixture solution, w through each solution hydroxide solution, w through each solution for a solution of hydro gas stream was absort nloric acid and estimates in electrical conduct partial neutralisation The volumes of hydro gas mixture produced olysis were found from tric pressure and char voltameter in series or producing the gas.	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity on of the gen/ by m the nges in a with the The hylamine	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>1. Hydrated chloride f reacted with KOH; g NaOH.</li> <li>2. Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> <li>REFERENCES:</li> <li>1. Lange's Handbook of</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction 1.0°C (752 mmHg) Chemistry
ref. change METHOD 'AI The par amine a ions da measure (2) & oxygen, sodium passed trimeth in the hydroch changes due to acid. oxygen electro baromet copper cell for partial were ca that equ	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydro (3)). Mixtures of hydro hydroxide solution, w through each solution hydroxide solution, w through each solution mylamine. The trimeth gas stream was absort holoric acid and estima s in electrical conduce partial neutralisation The volumes of hydroo gas mixture produced olysis were found from tric pressure and char voltameter in series or producing the gas. I pressures of trimeth alculated on the assum quilibrium was establi	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity on of the gen/ by n the nges in a with the The nylamine mption ished	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>Hydrated chloride f reacted with KOH; g NaOH.</li> <li>Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> <li>REFERENCES:</li> <li>Lange's Handbook of (12th edition), McG New York. 1979.</li> </ul>	negligible ALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction 1.0°C (752 mmHg) <i>Chemistry</i> raw-Hill,
ref. change METHOD 'AI The para amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes due to acid. oxygen electro baromet copper cell for partial were ca that eo between	(1), on the assumption ge of volume of the list prevention of the list above solutions of con- etermined by titration add by a dynamic method (3)). Mixtures of hyd (3)). Mixture solution hydroxide solution, w through each solution withough each solution hydroxide solution, w through each solution hydroxide solution for a cid and estimate s in electrical conduct partial neutralisation The volumes of hydrog gas mixture produced olysis were found from tric pressure and char voltameter in series or producing the gas. I pressures of trimeth alculated on the assum quilibrium was establish trimethylamine in so	AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity on of the gen/ by n the nges in a with the The nylamine nption ished olution	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>Hydrated chloride f reacted with KOH; g NaOH.</li> <li>Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> <li>REFERENCES:</li> <li>Lange's Handbook of (12th edition), McG New York. 1979.</li> <li>Gaus, Z. Anorg.</li> </ul>	negligible ALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction 1.0°C (752 mmHg) <i>Chemistry</i> raw-Hill,
ref. change METHOD AI The para amine a ions da measure (2) & oxygen, sodium passed trimeth in the hydrock changes due to acid. oxygen electro baromet copper cell for partial were ca that eo between and tha	(1), on the assumption ge of volume of the list PPARATUS/PROCEDURE: rtial pressures of tri- above solutions of con- etermined by titration ed by a dynamic method (3)). Mixtures of hydo (3)). Mixtures of hydo (3)). Mixtures of hydro (3)). Mixtures of hydro hydroxide solution, w through each solution hydroxide solution, w through each solution mylamine. The trimeth gas stream was absort holoric acid and estima s in electrical conduce partial neutralisation The volumes of hydroo gas mixture produced olysis were found from tric pressure and char voltameter in series or producing the gas. I pressures of trimeth alculated on the assum quilibrium was establi	AUXILIARY AUXILIARY AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of nylamine bed in ated from ctivity on of the gen/ by n the nges in a with the The nylamine mption ished olution during	<ul> <li>Solution of gas caused</li> <li>INFORMATION</li> <li>SOURCE AND PURITY OF MATERI</li> <li>Hydrated chloride f reacted with KOH; g NaOH.</li> <li>Kahlbaum Amylalkoho Pyridin distilled twice fro distilling 130.6-13 was collected.</li> <li>ESTIMATED ERROR:</li> <li>REFERENCES:</li> <li>Lange's Handbook of (12th edition), McG New York. 1979.</li> </ul>	Inegligible IALS: rom Kahlbaum; as dried with <i>l frei von</i> m Na; fraction 1.0°C (752 mmHg) Chemistry raw-Hill, Chem. <u>1900</u> , ld, H. Z. Phys.

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COMPONENTS:	······································		ORIGINAL MEASUREMENTS:	
	methylmethanam		Gerrard, W.	
	<pre>imethylamine); -50-3]</pre>	C <sub>3</sub> H <sub>9</sub> N;	Solubility of Gases and Liquids,	
2. 1-Octa	anol; $C_8H_{18}O$ ;	[111-87-5]	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:	<u> </u>		PREPARED BY:	
Temp	perature, press	ure	C. L. Young	
EXPERIMENTAL	WAT HEC.		L	
EXPERIMENTAL	I VALUES:	_	Mole fraction of trimethylamine in liquid,	
т/к	P/mmHg	P/10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>3</sub> N	
278.15	100	0.133	0.263	
	200	0.267	0.401	
	300 400	0.400 0.533	0.510 0.607	
	500	0.667	0.691	
	600	0.800	0.790	
	700	0.933	0.882	
283.15	760 100	1.013 0.133	0.936 0.240	
203.13	200	0.133	0.240	
	300	0.400	0.472	
	400	0.533	0.538	
	500 600	0.667 0.800	0.602 0.675	
	700	0.933	0.752	
	760	1.013	0.800	
293.15	760	1.013	0.636	
298.15	100	0.133	0.157	
	200 300	0.267 0.400	0.251 0.320	!
	400	0.533	0.382	
	500	0.667	0.436	
	600	0.800	0.486	
	700 760	0.933 1.013	0.538 0.568	
		AUXILIARY	INFORMATION	
METHOD / APPAR	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
	·	Inners madult		
of pure li	passed into a quid in a bubb sure measured	ler tube at a	l. British Drug Houses or Cambrian Gases sample.	L
	The amount of		2. Purified and attested by	
gas was es	stimated by wei	ghing. The	conventional procedures.	
	e was manually	controlled		
to within	0.2K. itus and proced	uro aro		
	by Gerrard [1,			
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES:	
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. 1976.	
_			Chapter 1.	

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	rs:		ORIGINAL MEASUREMENTS:	
	/-Dimethylmethanamine, (Trimethylamine); C <sub>3</sub> H <sub>9</sub> [75-50-3]		Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
2. Ber C	zenemethanol (benzyl 27 <sup>H</sup> 8 <sup>O</sup> ; [100-51-6]	alcohol);	<u></u> ,,	
VARIABLE	S:		PREPARED BY:	
	Concentration		P. G. T. Fc	aa
EXPERIME	NTAL VALUES:			
т/к	Concentration of C3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.0950	1.35	1308	0.0098
	0.247	3.57	1282	0.0250
	0.447	7.39	1127	0.0443
	0.486	8.37	1081	0.0480
	0.763	14.6	973	0.0734
	0.769	14.7	968	0.0739
	1.040	25.0	775	0.0975
ref.		on that di	he density of the solve ssolution of gas caused e.	
ref.	(1), on the assumpti	on that di iquid phas	ssolution of gas caused	
METHOD/A The pa amine ions c measur (2) & oxygen sodium passed trimet in the hydroo	(1), on the assumpti	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: From Kahlbaum; as dried with

r			
COMPONENTS :			ORIGINAL MEASUREMENTS:
1. <i>N</i> , <i>N</i> -Di	Imethylmethan	amine	Gerrard, W.
	ethylamine);	C <sub>3</sub> H <sub>9</sub> N;	Solubility of Gases and Liquids,
[75-50	-		
2. Benzer	nemethanol (E	Senzyl alcohol );	Plenum 1976, Chapter 10.
C <sub>7</sub> H <sub>6</sub>	30; [100-51-	.0]	
VARIABLES:		·	PREPARED BY:
•••••••••••••••••••••••••••••••••••••••			TREFACED DI:
Temp	perature, pre	ssure	C. L. Young
EXPERIMENTAL	VALUES:		
			Mole fraction of trimethylamine in liquid,
T/K	P/mmHg	<i>P/</i> 10⁵Pa	
1			<i>x</i> (CH <sub>3</sub> ) <sub>3</sub> N
			0.015
278.15	100 200	0.133 0.267	0.315 0.407
	200	0.400	0.484
	400	0.533	0.557
	500	0.667	0.644
	600	0.800	0.742
	700 760	0.933 1.013	0.866 0.925
283.15	100	0.133	0.293
200120	200	0.267	0.372
	300	0.400	0.448
	400	0.533	0.508 0.574
	500 600	0.667 0.800	0.644
	700	0.933	0.725
	760	1.013	0.776
293.15	760	1.013	0.585
298.15	100 200	0.133 0.267	0.224 0.301
	300	0.400	0.353
	400	0.533	0.395
	500	0.667	0.436
	600	0.800 0.933	0.475 · 0.516
	700 760	1.013	0.541
		AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE		SOURCE AND PURITY OF MATERIALS:
Amine was	passed into	a known weight	1. British Drug Houses or Cambrian
of pure li	quid in a bu.	bbler tube at a	Gases sample.
-		d by a manometer	2. Purified and attested by
assembly. qas was es		eighing. The	conventional procedures.
		ly controlled	
to within	0.2K.		
	tus and proc		
described	by Gerrard [	1,2].	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			(corrugred på combitet)
			REFERENCES:
			1. Gerrard, W.
		;	J. Appl. Chem. Biotechnol. <u>1972</u> , 22
			523-650.
			2. Gerrard, W.
			Solubility of Gases and Liquids. Plenum Press, New York. 1976.
			Chapter 1.
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COMPONENTS:       ORIGINAL MEASUREMENTS:         1. N,N-Dimethylmethanamine (trimethylamine); C <sub>3</sub> H <sub>9</sub> N; [75-50-3]       Gerrard, W.         2. 1,2-Ethanediol (Ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]       Solubility of Gases and Liquid Plenum 1976, Chapter 10.         VARIABLES:       PREPARED BY:         Temperature, pressure       C. L. Young         EXPERIMENTAL VALUES:       Values:	ds,
(trimethylamine); C3H9N;       Solubility of Gases and Liquid         [75-50-3]       Solubility of Gases and Liquid         2. 1,2-Ethanediol (Ethylene glycol);       Plenum 1976, Chapter 10.         C2H6O2; [107-21-1]       PREPARED BY:         VARIABLES:       PREPARED BY:         Temperature, pressure       C. L. Young         EXPERIMENTAL VALUES:       PREPARED BY:	ds,
[75-50-3]Solubility of Gases and Liqui2. 1,2-Ethanediol (Ethylene glycol); C2H6O2; [107-21-1]Plenum 1976, Chapter 10.VARIABLES: Temperature, pressurePREPARED BY:C. L. YoungEXPERIMENTAL VALUES:	ds,
2. 1,2-Ethanediol (Ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1] VARIABLES: Temperature, pressure EXPERIMENTAL VALUES: Plenum 1976, Chapter 10. PREPARED BY: C. L. Young	
C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1] VARIABLES: Temperature, pressure EXPERIMENTAL VALUES:	
Temperature, pressure C. L. Young EXPERIMENTAL VALUES:	
EXPERIMENTAL VALUES:	
Mole fraction of trimethylami in liquid,	ne
T/K $P/\text{mmHg}$ $P/10^5$ Pa $x$ (CH <sub>3</sub> ) <sub>2</sub> N	
283.15 100 0.133 0.116	
200 0.267 0.216	
300 0.400 0.304	
400         0.533         0.384           500         0.667         0.455	
600 0.800 0.531	
700 0.933 0.616	
760 1.013 0.672	
298.15         100         0.133         0.058           200         0.267         0.120	
300 0.400 0.120	
400 0.533 0.232	
500 0.667 0.285	
600 0.800 0.331	
700         0.933         0.378           760         1.013         0.396	
AUXILIARY INFORMATION	
METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS:	
Amine was passed into a known weight 1. British Drug Houses or Cam	orian
of pure liquid in a bubbler tube at a Gases sample. total pressure measured by a manometer	
assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus abd procedure are described by Gerrard [1,2].	
ESTIMATED ERROR:	<u></u>
$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
(estimated by compiler)	
REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. 1972 623-650. 2. Gerrard, W.	-
Solubility of Gases and Liquids Plenum Press, New York. <u>1976</u> . Chapter 1.	•

COMPONENT	S:		ORIGINAL MEASUREMENTS:	· · · · · · · · · · · · · · · · · · ·
(* [	-Dimethylmethanamine Trimethylamine); C <sub>3</sub> H 75-50-3]	9 <sup>N</sup> ;	Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
2. 2-P: [	ropanone, (acetone); 67-64-1]	с <sub>3</sub> н <sub>6</sub> о;		
VARIABLES	5:		PREPARED BY:	
	Concentration		P. G. T. Fo	ogg
EXPERIMEN	NTAL VALUES:		L	
т/К	Concentration of C <sub>3</sub> H <sub>9</sub> N in solytion/ mol dm	<sup>P</sup> C <sub>3</sub> H <sub>9</sub> N <sup>∕mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C <sub>3</sub> H <sub>9</sub> N
298.2	0.212	51.8	76.2	0.0153
	0.237	57.8	76.7	0.0171
	0.281	68.5	76.2	0.0202
	0.325	77.6	77.7	0.0233
ref.	ulated by the compile (1), on the assumpt ge of volume of the 1	ion that di	he density of the solve ssolution of gas caused e.	ent given in 1 negligible
ref.	(1), on the assumpt:	ion that di liquid phas	ssolution of gas caused	ent given in 1 negligible
METHOD/AF The pa: amine a ions da measure (2) & oxygen sodium passed trimetl in the hydrocl changes	(1), on the assumpt:	AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from activity	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATER 1. Hydrated chloride f reacted with KOH; c NaOH.	I negligible IALS: From Kahlbaum; gas dried with isulfitverbind- hydrous CuSO4;

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		N,N-Dimethy		197
COMPONENTS:			ORIGINAL MEASUREMENTS:	
	<pre>imethylmethana ethylamine);</pre>		Gerrard, W.	
[75-5		C3H9N;	Solubility of Gases and Liquids,	
2. 1.2.3	-Propanetriol	(Glycerol);	Plenum 1976, Chapter 10.	
C₃H	<sub>8</sub> O <sub>3</sub> ; [56-81-5	]		
VARIABLES:		······································	PREPARED BY:	
Те	emperature, pr	essure	C. L. Young	
EXPERIMENTAL	L VALUES:			
			Mole fraction of trimethylamine	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,	
1/1	1711111119	1/10 14	<sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
283.15	100	0.133	0.134	
	200	0.267	0.238 0.316	
	300 400	0.400 0.533	0.310	
	500 600	0.667 0.800	0.464 0.530	
	700	0.933	0.530	
298.15	760 100	1.013 0.133	0.657 0.075	
290.13	200	0.267	0.129	
	300 400	0.400 0.533	0.177 0.224	
	500	0.667	0.272	
	600 700	0.800 0.933	0.322 0.376	
	760	1.013	0.408	
		AUXILIARY	INFORMATION	
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	····
Amine was	passed into a	known weight	1. British Drug Houses or Cambria	n
		bler tube at a by a manometer	Gases sample.	
assembly.	The amount of	f absorbed	2. Purified and attested by	
	timated by we was manually		conventional procedures.	
to within	0.2K.	-		
The appara described	tus and proce by Gerrard [1	dure are		
	-			
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES:	
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 2. 623-650.	2
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. N,N-Dimethylmethanamine    (trimethylamine); C<sub>3</sub>H<sub>9</sub>N;</pre>	Gerrard, W.
[75-50-3]	Solubility of Gases and Liquids,
2. 1,4-Dioxane; C4H8O2; [123-91-1	] <i>Plenum</i> <u>1976</u> , Chapter 10.
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
	Mole fraction of trimethylamine
T/K P/mmHg P/10 <sup>5</sup> Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N
283.15 760 1.013	0.680
AUXILIAR	Y INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manomete assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].	1. British Drug Houses or Cambrian Gases sample.
	ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)
	REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTS			methanamine	
	<u></u>		ORIGINAL MEASUREMENTS:	
(T [7 2. Acet	Dimethylmethanamine rimethylamine); C <sub>3</sub> H 5-50-3] ic acid, ethyl este etate); C <sub>4</sub> H <sub>8</sub> O <sub>2</sub> ; [14]	9 <sup>N</sup> ; r (ethyl	Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
VARIABLES:			PREPARED BY:	
VARIABILD I	Concentration		P. G. T. Fo	933
EXPERIMENT	AL VALUES:			
Т/К	Concentration of C3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.213	46.7	84.9	0.0205
	0.250	54.7	85.0	0.0240
	0.267	59.0	84.1	0.0256
ref.	lated by the compile (1), on the assumpti e of volume of the l	on that di. iquid phas	<u></u>	nt given in negligible
ref. change	(1), on the assumpti e of volume of the l	on that di. iquid phas	ssolution of gas caused e. INFORMATION	negligible
ref. change METHOD/APPA The part amine ab ions det measured (2) & (3) oxygen, sodium h passed t trimethy in the g hydrochl changes	(1), on the assumpti	AUXILIARY AUXILIARY imethyl- oncentrat- on, were od (refs. drogen and blysis of were on of hylamine bed in lated from octivity	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERIA 1. Hydrated chloride f reacted with KOH; g NaOH.	negligible ALS: rom Kahlbaum; as dried with ed in ref.(4);

COMPONENTS:			ORIGINAL MEASUREMENTS:	
(Tr: [75- 2. 1,1'-(	imethylmethanamine imethylamine); C <sub>3</sub> H -50-3] Oxybis-ethane, (eth 10 <sup>0</sup> ; [60-29-7]	9 <sup>N</sup> ;	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.	
VARIABLES:			PREPARED BY:	
	Concentration		P. G. T. Fo	aa
EXPERIMENTA	L VALUES:	<u></u>		
	Concentration of 3 <sup>H</sup> 9 <sup>N</sup> in solytion/ mol dm	<sup>p</sup> c <sub>3</sub> H <sub>9</sub> N <sup>/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.0868	29.5	54.7	0.0089
	0.1270	44.3	53.3	0.0130
	0.1310	46.9	51.9	0.0134
ref. (]	ated by the compile 1), on the assumpti of volume of the 1	ion that dis Liquid phase		nt given in negligible
ref. (] change	l), on the assumpti of volume of the l	ion that dis Liquid phase	ssolution of gas caused	negligible
ref. (1 change METHOD/APPA The parti amine abc ions dete measured (2) & (3) oxygen, p sodium hy passed th trimethyl in the ga hydrochlc changes i	l), on the assumpti	AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of chylamine cbed in mated from activity	ssolution of gas caused e.	negligible ALS: from Kahlbaum;

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COMPONENTS :	
	ORIGINAL MEASUREMENTS:
<pre>1. N, N-Dimethylmethanamine, (Trimethylamine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. 1-Phenyl-ethanone, (acetophenone); C<sub>8</sub>H<sub>8</sub>O; [98-86-2]</pre>	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.
VARIABLES:	PREPARED BY:
Concentration	P. G. T. Fogg
EXPERIMENTAL VALUES:	
Concentration of $T/K = C_3 H_9 N$ in solution/ $P_{C_3 H_9 N} M_{mol}$ dm	Concentration of Mole fraction MHg C <sub>3</sub> H <sub>9</sub> N in solution/ in solution* concentration <sup>xx</sup> C <sub>3</sub> H <sub>9</sub> N in gas phase <sup>2</sup> G <sub>3</sub> H <sub>9</sub> N
298.2 0.212 68.5	57.6 0.0243
0.379 120.7	58.1 0.0426
* Calculated by the compiler, using t	
ref. (1), on the assumption that di change of volume of the liquid phas	
ref. (1), on the assumption that di change of volume of the liquid phas AUXILIARY	ssolution of gas caused negligible e. INFORMATION
ref. (1), on the assumption that di change of volume of the liquid phas	ssolution of gas caused negligible e.

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COMPONENTS :			ORIGINAL MEASUREMENTS:
	nethylmethanar	nine	Gerrard, W.
(trimet	hylamine); (	C <sub>3</sub> H <sub>9</sub> N;	
[75-50-	-3]	i	Solubility of Gases and Liquids,
2. 1-Pheny ketone)	ylethanone (me ); C <sub>8</sub> H <sub>8</sub> O; [9	ethyl phenyl 98-86-2]	<i>Plenum 1976</i> , Chapter 10.
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
EXPERIMENTAL	VALUES:		L
			Mole fraction of trimethylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>3</sub> N
298.15	100	0.133	0.039
	200	0.267	0.080
	300 400	0.400 0.533	0.117 0.157
	500 600	0.667	0.202 0.252
	700	0.933	0.310
	760	1.013	0.353
		AUXILIARY	INFORMATION
METHOD /APPAR/	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
		known weight	1. British Drug Houses or Cambrian
of pure li	quid in a bub	bler tube at a	Gases sample.
assembly. gas was es	sure measured The amount o timated by we e was manuall	ighing. The	2. Purified and attested by conventional procedures.
to within The appara		dure are	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1; \ \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES :
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</pre>
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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1. <i>N,N-</i> Di			ORIGINAL MEASUREMENTS:	
<pre>1. N, N-Dimethylmethanamine   (trimethylamine); C<sub>3</sub>H<sub>9</sub>N;   [75-50-3] 2. Ethoyubenzene (ethyl phenyl</pre>			Gerrard, W. Solubility of Gases and Liquids,	
2. Ethoxybenzene (ethyl phenyl ether); C <sub>0</sub> H <sub>10</sub> O; [103-73-1]		phenyl 03-73-1]	Plenum <u>1976</u> , Chapter 10.	
VARIABLES:	a and		PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL	VALUES:		Mole fraction of trimethylamine	
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid, (CH₃)₃N	
283.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.076 0.160 0.255 0.354 0.460 0.566 0.680 0.750	
		AUXILIARY	INFORMATION	
Amine was p of pure lid total press assembly. gas was es temperature to within The appara	ATUS/PROCEDURE: passed into a l quid in a bubb sure measured l The amount of timated by weig e was manually 0.2K. tus and proced by Gerrard [1,	known weight ler tube at a by a manometer absorbed ghing. The controlled ure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	

## N,N-Dimethylmethanamine

COMPONENTS:			ORIGINAL MEASUREMENTS:	
	) imethylmethanamine,		Halban, H.	
(Tr [75	cimethylamine); C <sub>3</sub> H <sub>9</sub> 5-50-3]	N;	Z. Phys. Chem.	
-	-	<i>.</i>	<u>1913</u> , 84, 129-159.	
2. Benzo ber	oic acid, ethyl este nzoate) C <sub>9</sub> H <sub>10</sub> O <sub>2</sub> ; [93	r (ethyl -89-0]		
VARIABLES:			PREPARED BY:	· · · · · · · · · · · · · · · · · · ·
	Concentration		P. G. T. Fo	933
EXPERIMENTA	AL VALUES:			
т/к с	Concentration of C <sub>3</sub> H <sub>9</sub> N in solytion/ mol dm	<sup>p</sup> c <sub>3<sup>H</sup>9</sub> N∕mπ	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C <sub>3</sub> H <sub>9</sub> N
298.2	0.1561	38.1	76.2	0.0220
	0.1622	39.6	76.2	0.0228
ref. (		on that di	he density of the solve ssolution of gas caused e.	
ref. (	1), on the assumption	on that di iquid phas	ssolution of gas caused	
ref. ( change	1), on the assumption of volume of the 1	on that di iquid phas	ssolution of gas caused e.	negligible
ref. ( change METHOD/APP/ The part amine ab ions det measured	1), on the assumption of volume of the line ARATUS/PROCEDURE: tial pressures of transformer ove solutions of con- termined by titration by a dynamic method	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs.	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: rom Kahlbaum; as dried with
ref. ( change METHOD/APP/ The part amine ab ions det measured (2) & (3 oxygen, sodium h ed throu trimethy in the g hydrochl changes	1), on the assumption of volume of the 1: ARATUS/PROCEDURE: tial pressures of trans- tove solutions of con- termined by titration by a dynamic method by a dynamic met	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were pass- hylamine bed in ated from ctivity	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: rom Kahlbaum; as dried with
ref. ( change METHOD/APP/ The part amine ab ions det measured (2) & (3 oxygen, sodium h ed throu trimethy in the g hydrochl changes due to p acid. To oxygen g electrol	1), on the assumption of volume of the 1: ARATUS/PROCEDURE: tial pressures of trans- tove solutions of con- termined by titration by a dynamic method by a dynamic method by a dynamic method by a dynamic method by a dynamic method produced by electro by droxide solution, with the solution of chamine. The trimeth as stream was absorb oric acid and estimation	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were pass- hylamine bed in ated from ctivity on of the gen/ by the	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum; b.p. 212.	ALS: rom Kahlbaum; as dried with

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COMPONENTS:	<u> </u>		ORIGINAL MEASUREMENTS:
1. <i>N.N-</i> Di	methylmethana	nine	Gerrard, W.
	thylamine); (		Solubility of Gases and Liquids,
1 -	c acid, ethyl	ester	- · · · ·
(eth	yl benzoate); 89-0]		<i>Plenum <u>1976</u>, Chapter 10.</i>
VARIABLES:			PREPARED BY:
Ter	perature, pres	ssure	C. L. Young
EXPERIMENTAL	VALUES:		······································
			Mole fraction of trimethylamine in liquid,
т/к	P/mmHg	<i>P/</i> 10⁵Pa	<sup><i>x</i></sup> (CH <sub>3</sub> ) <sub>3</sub> N
293.15	760	1.013	0.506
298.15	100 200	0.133 0.267	0.051 0.103
	300 400	0.400 0.533	0.152 0.205
	500	0.667	0.256
	600 700	0.800 0.933	0.292 0.376
	760	1.013	0.423
			-
		AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li	passed into a quid in a bub	bler tube at a	l. British Drug Houses or Cambrian Gases sample.
assembly. gas was es	sure measured The amount of timated by we was manually	ighing. The	2. Purified and attested by conventional procedures.
to within The appara		dure are	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			REFERENCES:
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

## N,N-Dimethylmethanamine

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1 1 11 11-1-	methylmethanam	ine	Gerrard, W.	
(trime	ethylamine); C	3H <sub>9</sub> N;	Solubility of Gases and Liquids,	
[75-50	-			
<pre>2. l,l'-Oxybisoctane (dioctyl ether); C16H340; [629-82-3]</pre>			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Temperature, p	ressure	C. L. Young	
EXPERIMENTA	L VALUES:			
т/К	P/mmHg	P/10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) 3N	
			· · · · · · · · · · · · · · · · · · ·	
293.15	400 500 600 700 760	0.533 0.667 0.800 0.933 1.013	0.376 0.452 0.524 0.595 0.630	
298.15	100 200 300 400	0.133 0.267 0.400 0.533	0.148 0.232 0.302 0.366	
	500 600 700 760	0.667 0.800 0.933 1.013	0.426 0.482 0.536 0.567	
		AUXILIARY	INFORMATION	
METHOD/APPA	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
of pure l		known weight bler tube at a	1. British Drug Houses or Cambrian Gases sample.	
		by a manometer		
assembly. gas was e temperatu to within The appar	stimated by we re was manuall 0.2K. atus and proce by Gerrard [1	by a manometer f absorbed ighing. The y controlled dure are		
assembly. gas was e temperatu to within The appar	re was manuall 0.2K. atus and proce	by a manometer f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures.	
assembly. gas was e temperatu to within The appar	re was manuall 0.2K. atus and proce	by a manometer f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures. ESTIMATED ERROR:	
assembly. gas was e temperatu to within The appar	re was manuall 0.2K. atus and proce	by a manometer f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
assembly. gas was e temperatu to within The appar	re was manuall 0.2K. atus and proce	by a manometer f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	
assembly. gas was e temperatu to within The appar	re was manuall 0.2K. atus and proce	by a manometer f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	

The second s				
COMPONENT	S:		ORIGINAL MEASUREMENTS:	<u> </u>
( [	-Dimethylmethanamine, Trimethylamine); C <sub>3</sub> H <sub>9</sub> 75-50-3] tonitrile; C <sub>2</sub> H <sub>3</sub> N; [75	N ;	Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
VARIABLES	<u>.</u>		PREPARED BY:	
VIIIIIIII	Concentration		P. G. T. Fo	þaa
EXPERIMEN	TAL VALUES:			
T/K	Concentration of C <sub>3</sub> H <sub>9</sub> N in solution/ mol dm	<sup>p</sup> c <sub>3</sub> H <sub>9</sub> N <sup>∕mr</sup>	Concentration of mHg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>xC</sup> 3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.1200	35.3	63.2	0.0063
	0.1260	37.0	63.2	0.0066
	0.1620	46.7	64.3	0.0085
ref.	ulated by the compile (1), on the assumpti ge of volume of the l	on that di	the density of the solve issolution of gas caused se.	ent given in I negligible
ref.	(1), on the assumption	on that di iquid phas	ssolution of gas caused	nt given in I negligible
ref. chan METHOD/AP The pa amine ions d measur (2) & oxygen sodium passed trimet in the hydrocl	(1), on the assumption	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from	Source AND PURITY OF MATERIA 1. Hydrated chloride f reacted with KOH; g NaOH. 2. Kahlbaum; dried ove	ALS: Trom Kahlbaum; as dried with

## N,N-Dimethylmethanamine

	74,74-Dimee	
COMPONENT	rs :	ORIGINAL MEASUREMENTS:
() [`	-Dimethylmethanamine, Trimethylamine); C <sub>3</sub> H <sub>9</sub> N; 75-50-3] romethane ; CH <sub>3</sub> NO <sub>2</sub> ; [75-52-5]	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.
VARIABLES	C •	PREPARED BY:
VARIAD <u>UE</u> .	Concentration	P. G. T. Fogg
EXPERIMEN	NTAL VALUES:	
т/к	Concentration of $C_{3}H_{9}N$ in solution/ $PC_{3}H_{9}N'$ mol dm	Concentration of Mole fraction $C_3H_9N$ in solution/ in solution* concentration $C_3H_9N$ in gas phase $C_3H_9N$
298.2	0.1070 35.4	56.0 0.0057
	0.1272 42.1	. 56.0 0.0068
	0.1419 46.8	56.5 0.0076
	0.1741 56.4	57.5 0.0093
* (2)	ulated by the compiler using	the density of the solvent given in
ref.	ulated by the compiler, using (1), on the assumption that ge of volume of the liquid pr	the density of the solvent given in dissolution of gas caused negligible ase.
ref. chang	<pre>(1), on the assumption that ge of volume of the liquid ph</pre>	dissolution of gas caused negligible ase. RY INFORMATION
ref. chang METHOD/AH The pa: amine a ions da measura (2) & oxygen sodium passed trimetl in the hydrocl	<pre>(1), on the assumption that ge of volume of the liquid ph AUXILIA PPARATUS/PROCEDURE: rtial pressures of trimethyl- above solutions of concentrate etermined by titration, were ed by a dynamic method (refs. (3)). Mixtures of hydrogen a , produced by electrolysis of hydroxide solution, were through each solution of hylamine. The trimethylamine gas stream was absorbed in hloric acid and estimated from the solution of the sol</pre>	<pre>dissolution of gas caused negligible ase. RY INFORMATION SOURCE AND PURITY OF MATERIALS: - 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Prepared according to ref. (4); dried over potassium carbonate; b.p. 100.6 C (751 mmHg).</pre>
ref. change METHOD/AI The pa: amine a ions do measure (2) & oxygen sodium passed trimetl in the hydrocol change: due to acid.	<pre>(1), on the assumption that ge of volume of the liquid ph AUXILIA PPARATUS/PROCEDURE: rtial pressures of trimethyl- above solutions of concentrate etermined by titration, were ed by a dynamic method (refs. (3)). Mixtures of hydrogen a , produced by electrolysis of hydroxide solution, were through each solution of hylamine. The trimethylamine gas stream was absorbed in</pre>	dissolution of gas caused negligible ase. RY INFORMATION SOURCE AND PURITY OF MATERIALS: - 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Prepared according to ref. (4); dried over potassium carbonate; b.p. 100.6 C (751 mmHg).

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		ORIGINAL MEASUREMENTS:
		Gerrard, W.
thylamine); C <sub>3</sub> F -3]	19N;	Solubility of Gases and Liquids,
methylformamide; -2]	; C <sub>3</sub> H <sub>7</sub> NO;	Plenum <u>1976</u> , Chapter 10.
		PREPARED BY:
emperature, pre	ssure	C. L. Young
L VALUES:		Mole fraction of trimethylamine in liquid,
P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) <sub>3</sub> N
100	0.133	0.028
200	0.267	0.072
300	0.400	0.128
	0.533	0.202
		0.305
		0.442
		0.700
		0.880
		0.024 0.060
		0.080
400		0.145
500	0.667	0,205
600	0.800	0.288
	0.933	0.410
		0.511
		0.017
		0.037
		0.060
		0.084 0.106
		0.132
700		0.165
760	1.013	0.191
, 16 <u> </u>	AUXILIARY	INFORMATION
RATUS / PROCEDURE :		SOURCE AND PURITY OF MATERIALS:
	no	
quid in a bubbl	er tube at a	1. British Drug Houses or Cambrian Gases sample.
		2. Purified and attested by
		conventional procedures.
e was manually	controlled	
0.2K.		
-	-	
		ESTIMATED ERROR:
		$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
		(estimated by compiler)
		REFERENCES :
		1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
		2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.
	thylamine); C <sub>3</sub> H -3] methylformamide; -2] emperature, pres . VALUES: P/mmHg 100 200 300 400 500 600 700 760 100 200 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760 700 760	methylformamide;       C <sub>3</sub> H <sub>7</sub> NO;         -2]         emperature, pressure         . VALUES:         P/nmHg       P/10 <sup>5</sup> Pa         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         AUXILIARY

COMPONENTS:			ORIGINAL MEASUREMENTS:
1. N,N-D:	<pre>imethylmethana ethylamine);</pre>	amine CoHoN:	Gerrard, W.
[75-50		C 3 H g N ;	Solubility of Gases and Liquids,
	ine; C <sub>5</sub> H <sub>5</sub> N;	[110-86-1]	Plenum 1976, Chapter 10.
or Ouinol	line; C <sub>9</sub> H <sub>7</sub> N;	[91-22-5]	<u> </u>
VARIABLES:			PREPARED BY:
	Pressure		C. L. Young
			-
EXPERIMENTAL	VALUES:		
[			Mole fraction of trimethylamine
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
-,	,	-,20 -4	<sup><i>x</i></sup> (CH <sub>3</sub> ) <sub>3</sub> N
		······································	······································
		Pyridine;	$C_{5}H_{5}N;$ [110-86-1]
283.15	700 760	0.933 1.013	0.65 0.70
	700	1.013	0.70
		Ouinoline	$C_{9}H_{7}N;$ [91-22-5]
283.15	100	0.133	0.051
	200	0.267	0.112
	300 400	0.400 0.533	0.179 0.248
	500	0.667	0.321
	600 700	0.800 0.933	0.413 0.545
	760	1.013	0.648
	_	AUXILIARY	INFORMATION
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
of pure li	quid in a bub	known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.
assembly.	The amount o		2. Purified and attested by
	timated by we e was manuall		conventional procedures.
to within	0.2K.	-	
	tus and proce by Gerrard [1		
		,_,.	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
2			(estimated by compiler)
			REFERENCES:
			<ol> <li>Gerrard, W.</li> <li><i>Appl. Chem. Biotechnol.</i> <u>1972</u>, 22</li> <li>623-650.</li> </ol>
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

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COMPONENTS:			ORIGINAL MEASUREMENTS:
1. N.N-M	ethylmethanami	ne	Gerrard, W.
(trime	ethylamine);		
[75-50	0-3]		Solubility of Gases and Liquids,
	benzene; C <sub>6</sub> H <sub>5</sub>	NO <sub>2</sub> ;	Plenum <u>1976</u> , Chapter 10.
[98-95	5-3]		
VARIABLES:			PREPARED BY:
Те	emperature, pr	essure	C. L. Young
EXPERIMENTAL	. VALUES:		
			Mole fraction of trimethylamine
т/К	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,
ITA	1 / Kulling	1/10 Fa	$^{x}$ (CH <sub>3</sub> ) <sub>3</sub> N
	<u></u>		
283.15	100	0.133	0.060
	200	0.267	0.119 0.184
	300 400	0.533	0.184
1	500	0.667	0.356
	600	0.800	0.464
	700 760	0.933 1.013	0.595 0.694
298.15	100	0.133	0.032
	200	0.267	0.070
	300 400	0.400 0.533	0.110 0.151
	500	0.667	0.196
	600	0.800	0.243
	700 760	0.933 1.013	0.293 0.326
		1.015	
]			
		AUXILIARY	INFORMATION ·-
METHOD/APPAF	RATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:
		known weight bler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>
total pres	sure measured	by a manometer	
assembly.	The amount c	f abosrbed	2. Purified and attested by
gas was es	stimated by we e was manuall	ighing. The	conventional procedures.
to within		y concrorred	
	tus and proce		
described	by Gerrard [1	,2].	
			ESTIMATED ERROR:
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
			(estimated by compiler)
			(commence of competer)
			REFERENCES :
			1. Gerrard, W.
			J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.
			623-650. 2. Gerrard, W.
			Solubility of Gases and Liquids.
			Plenum Press, New York. 1976.
			Chapter 1.

1. N.N-	:		ORIGINAL MEASUREMENTS:	
r) 7]	Dimethylmethanamine Trimethylamine); C <sub>3</sub> H 25-50-3]	9 <sup>N</sup> ;	Halban, H. Z. Phys. Chem. <u>1913</u> , 84, 129-159.	
2. Nitr	obenzene ; C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ;	[98-95-3]		
VARIABLES	:		PREPARED BY:	
	Concentration		P. G. T. Fc	bââ
EXPERIMENT	TAL VALUES:	<u> </u>		
т/к	Concentration of C <sub>3</sub> H <sub>9</sub> N in solution/ mol dm	<sup>p</sup> C <sub>3</sub> H <sub>9</sub> N <sup>/mm</sup>	Concentration of hHg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.180	63.3	52.8	0.0182
	0.236	81.7	53.7	0.0237
	0.268	94.5	52.7	0.0268
+ 0-1			he density of the solve	nt given in
ref.	lated by the compile (1), on the assumpt of volume of the i	ion that di liquid phas		nt given in I negligible
ref. chanç	(1), on the assumption of volume of the state of the stat	ion that di liquid phas	issolution of gas caused se. INFORMATION	l negligible
ref. chang METHOD/API The par amine a ions de measure (2) & ( oxygen, sodium passed trimeth in the hydroch changes	(1), on the assumpting of volume of the interpretent of volume of the interpretent of	AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from uctivity	ISSOLUTION OF GAS CAUSED SE. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride for reacted with KOH; ga NaOH.	ALS: ALS: rom Kahlbaum; as dried with
ref. chang METHOD/API The par amine a ions de measure (2) & ( oxygen, sodium passed trimeth in the hydroch changes due to acid. oxygen electro baromet	(1), on the assumption of volume of the second seco	AUXILIARY AUXILIARY rimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of thylamine rbed in mated from uctivity ion of the ogen/ d by om the anges in a	INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride for reacted with KOH; ga NaOH. 2. Kahlbaum aus krist.	h negligible ALS: rom Kahlbaum; as dried with

			· · · · · · · · · · · · · · · · · · ·	
COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. N,N-D	imethylmethan	amine	Gerrard, W.	
(trim [75-5	ethylamine); 0-31	C <sub>3</sub> H <sub>9</sub> N;	Solubility of Gases and Liquids,	
[				
<pre>2. Benzenamine (Aniline); C<sub>6</sub>H<sub>7</sub>N; [62-53-3]</pre>			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	-
	Pressure		C. L. Young	
EXPERIMENTAL	WAT HES .			
EAFERIMENTAL	ALUES.			1
			Mole fraction of trimethylamine	
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,	
1/1	- / mining	-/2014	x (CH <sub>3</sub> ) <sub>3</sub> N	
		<u> </u>		-
283.15	100	0.133	0.111	
	200	0.267 0.400	0.217 0.327	
	300 400	0.533	0.327	
j	500	0.667	0.531	
	600	0.800	0.626	
	700 760	0.933 1.013	0.720 0.775	ļ
				-
			INFORMATION	_
			· · · · · · · · · · · · · · · · · · ·	
	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	ļ
of pure li	lquid in a bub		1. British Drug Houses or Cambrian Gases sample.	
of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].			2. Purified and attested by conventional procedures.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650. 2. Gerrard, W.	
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

COMPONENTS :				
	·	C	RIGINAL MEASUREMENTS:	
<pre>1. N,N-Dimeth     (trimethyla     [75-50-3]</pre>			Gerrard, W.	
2. N-Methylbenzenamine; C <sub>7</sub> H <sub>9</sub> N; [100-61-8]			Solubility of Gases and Liquids, Plenum, <u>1976</u> , Chapter <del>10</del> .	
VARIABLES:		F	PREPARED BY:	
	_			
	Pressure		C. L. Young	
EXPERIMENTAL VAL		D / 1 0 5 D	Mole fraction of N,N-dimethylmethanamine	
т/К	P/mmHg 1	P/10⁵P	a in liquid, <sup>∞</sup> C₃H₃N	
			C3N9N	
283.15	100	0.133	0.060	
203.13	200	0.267		
	300	0.400		
	400	0.533		
	500	0.667		
	600	0.800		
	700	0.933		
	760	1.013		
<u></u>				
	AUXI	LIARY I	NFORMATION	
METHOD APPARATUS			NFORMATION SOURCE AND PURITY OF MATERIALS:	
Amine was pass of pure liqui	/PROCEDURE: sed into a known weig d in a bubbler tube a	ght	SOURCE AND PURITY OF MATERIALS; 1. British Drug Houses or Cambrian Gases sample.	
Amine was pass of pure liquid a total press manometer ass absorbed gas y	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by	ght at	SOURCE AND PURITY OF MATERIALS:	
Amine was pass of pure liquid a total press nanometer ass absorbed gas w weighing. Th	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o	ght at of	SOURCE AND PURITY OF MATERIALS; 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	
Amine was pass of pure liquid a total press manometer ass absorbed gas weighing. The manually cont	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by he temperature was	ght at of K.	<ul> <li>SOURCE AND PURITY OF MATERIALS;</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> </ul>	
Amine was pass of pure liquid a total press manometer ass absorbed gas weighing. The manually cont: The apparatus	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by he temperature was rolled to within 0.21	ght at of K.	<ul> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> </ul>	
Amine was pass of pure liquid a total press manometer ass absorbed gas weighing. The manually cont: The apparatus	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by he temperature was rolled to within 0.21 and procedure are	ght at of K.	<ul> <li>SOURCE AND PURITY OF MATERIALS;</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR:</li> <li>δT/K = ±0.1; δx/x = ±3%</li> </ul>	
Amine was pass of pure liquid a total press manometer ass absorbed gas weighing. The manually cont: The apparatus	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by he temperature was rolled to within 0.21 and procedure are	ght at of K.	<ul> <li>SOURCE AND PURITY OF MATERIALS:</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> </ul>	
of pure liquid a total press manometer ass absorbed gas weighing. The manually cont: The apparatus	PROCEDURE: sed into a known weig d in a bubbler tube a ure measured by a embly. The amount o was estimated by he temperature was rolled to within 0.21 and procedure are	ght at of K.	<ul> <li>SOURCE AND PURITY OF MATERIALS;</li> <li>1. British Drug Houses or Cambrian Gases sample.</li> <li>2. Purified and attested by conventional procedures.</li> <li>ESTIMATED ERROR:</li> <li>δT/K = ±0.1; δx/x = ±3%</li> </ul>	

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COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. N,N-Dimethylmethanamine, (trimethylamine); C <sub>3</sub> H <sub>3</sub> N;			Gerrard, W.	
	50-3]	C3H9N;	Solubility of Gases and Liquids,	
2. Benzon	. Benzonitrile; C7H5N; [100-47-0]		Plenum 1976, Chapter 10.	
			<u> </u>	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
			L	
EXPERIMENTAL	VALUES:			
			Mole fraction of trimethylamine in liquid,	
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>3</sub> N	
<u></u>		······		
283.15	100	0.133	0.067	
	200	0.267	0.140	
	300 400	0.400 0.533	0.217 0.302	
	500	0.667	0.400	
	600 700	0.800 0.933	0.507 0.640	
	760	1.013	0.720	
	***			
		AUXILIARY	INFORMATION	
ME THOD / AP PAR	ATUS / PROCEDURE :	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:	
Amine was of pure li	passed into a k quid in a bubbl	nown weight er tube at a	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	
Amine was of pure li total pres	passed into a k quid in a bubbl sure measured b	nown weight er tube at a y a manometer	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	
Amine was of pure li total pres assembly. gas was es	passed into a k quid in a bubbl sure measured b The amount of timated by weig	nown weight er tube at a y a manometer absorbed hing. The	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	1
Amine was of pure li total pres assembly. gas was es temperatur	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually	nown weight er tube at a y a manometer absorbed hing. The	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	1 1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:	1
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3$ %	2
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a k quid in a bubbl sure measured b The amount of timated by weig e was manually 0.2K. tus and procedu	nown weight er tube at a y a manometer absorbed hing. The controlled re are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	

COMPONENT	S:		ORIGINAL MEASUREMENTS:	
<ol> <li>N, N-Dimethylmethanamine, (Trimethylamine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3]</li> <li>1-Methyl-2-nitrobenzene;</li> </ol>			Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
C	7 <sup>H</sup> 7 <sup>NO</sup> 2; [88-72-2]	i		
VARIABLES	:		PREPARED BY:	
	Concentration		P. G. T. Fo	aa
EXPERIMEN	TAL VALUES:			
т/К	Concentration of C <sub>3</sub> H <sub>9</sub> N in solution/ mol dm	<sup>p</sup> c <sub>3<sup>H</sup>9</sub> N <sup>/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>g</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>
298.2	0.250	86.6	53.7	0.0286
	0.256	85.2	55.8	0.0293
ref.	ulated by the compile (1), on the assumpti ge of volume of the l	on that di iquid phas	the density of the solve ssolution of gas caused e. INFORMATION	nt given in I negligible
ref. chan	(1), on the assumpti ge of volume of the l	on that di iquid phas	ssolution of gas caused e. INFORMATION	l negligible
ref. chand METHOD/AP The pa: amine a ions da measura (2) & oxygen sodium passed trimetl in the hydrocl change	(1), on the assumpti	on that di iquid phas AUXILIARY imethyl- ncentrat- n, were d (refs. drogen and lysis of were n of hylamine bed in ated from ctivity	ssolution of gas caused ie. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: ALS: From Kahlbaum; as dried with m; purified by . (4); dried

nethylmethana hylamine);	mine	ORIGINAL MEASUREMENTS:	
	mino		
		Gerrard, W.	
-3]	C 3 A 9 N 7	Solubility of Gases and Liquids,	
		Plenum 1976, Chapter 10.	
			[
emperature,	pressure	C. L. Young	
VALUES:		Mole fraction of trimethylamine	
P/mmHg	P/10⁵Pa	тії іїцаїа, <sup>x</sup> (СН <sub>3</sub> ) <sub>3</sub> N	
100	0.133	0.071	
200	0.267	0.146	
600	0.800	0.647	
700	0.933	0.828	
760			
		0.202	
400	0.533	0.284	
			1
760	1.013	0.406	
100	0.133		
			1
	0.667	0.204	
600	0.800	0.250	
700 760	0.933 1.013	0.301 0.331	-
	AUXILIARY	INFORMATION	
TUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
assed into a	known weight	1. British Drug Houses or Cambrian	
The amount o imated by we	of absorbed ghing. The	2. Purified and attested by conventional procedures.	
	y controlled		
us and proce			
		ESTIMATED ERROR:	
		$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
		(estimated by compiler)	
		REFERENCES	
		I. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
		2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1	
	<pre>cotoluene); 2] emperature, VALUES:</pre>	Pemperature, pressure         VALUES:         P/mmHg       P/10 <sup>5</sup> Pa         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.013         100       0.133         200       0.267         300       0.400         400       0.533         500       0.667         600       0.800         700       0.933         760       1.	cotolenee); $C_7H_7NO_2;$ PREPARED BY:         21       PREPARED BY:         VALUES:       Mole fraction of trimethylamine in liquid, P/mmHg         100       0.133         000       0.267         300       0.400         000       0.267         500       0.667         760       0.133         100       0.133         000       0.267         760       0.133         100       0.133         000       0.267         300       0.400         200       0.267         0.133       0.920         100       0.133         0.202       0.132         300       0.400         0.133       0.647         760       1.013         100       0.133         0.267       0.380         700       0.933         760       1.013         1013       0.406         100       0.133         0.267       0.284         500       0.667         760       1.013         1013       0.406         100       0.533

COMPONENTS: 1. N,N-Di			ORIGINAL MEASUREMENTS:	
(trimethylamine); C <sub>3</sub> H <sub>9</sub> N; [75-50-3]			Gerrard, W. Solubility of Gases and Liquids,	
2. Benzenemethanamine, (Benzylamine); C <sub>7</sub> H <sub>9</sub> N; [100-46-9]			Plenum, <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL VALUES:				
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> ₽a	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
283.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.060 0.128 0.203 0.284 0.380 0.492 0.640 0.732	
		AUXILIARY	INFORMATION	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	quid in a bu sure measure The amount timated by w e was manual	a known weight bbler tube at a d by a manometer of absorbed eighing. The ly controlled edure are	INFORMATION SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.	

COMPONENTS:			ORIGINAL MEASUREMENTS:	
	)imethylmethan hethylamine); 60-3]		Gerrard, W. Solubility of Gases and Liquids,	
2. N-Ethylbenzenamine (N-ethyl- aniline); C <sub>8</sub> H <sub>11</sub> N; [103-69-5]			Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
Pressure			C. L. Young	
EXPERIMENTA	L VALUES:			
T/K	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
			(	
283.15	100 200 300 400 500 600 700 760	0.133 0.267 0.400 0.533 0.667 0.800 0.933 1.013	0.124 0.233 0.335 0.432 0.526 0.612 0.712 0.771	
		AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE: Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K.		a known weight bbler tube at a d by a manometer of absorbed eighing. The ly controlled	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.	
The appar described	atus and proc by Gerrard [	edure are 1,2].		
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

ORIGINAL MEASUREMENTS: Gerrard, W. Solubility of Gases and Liquids, Plenum 1976, Chapter 10. PREPARED BY: C. L. Young Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N
Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10. PREPARED BY: C. L. Young Mole fraction of trimethylamine in liquid,
Plenum <u>1976</u> , Chapter 10. PREPARED BY: C. L. Young Mole fraction of trimethylamine in liquid,
PREPARED BY: C. L. Young Mole fraction of trimethylamine in liquid,
C. L. Young Mole fraction of trimethylamine in liquid,
C. L. Young Mole fraction of trimethylamine in liquid,
Mole fraction of trimethylamine in liquid,
in liquid,
0.141
0.265
0.387 0.507
0.628
0.750
0.866
0.930 0.106
0.213
0.317
0.418
0.516 0.617
0.717
0.776
0.585
0.075 0.141
0.210
0.277
0.340
0.400 0.463
0.500
ARY INFORMATION
SOURCE AND PURITY OF MATERIALS:
t l. British Drug Houses or Cambrian a Gases sample.
ter 2. Purified and attested by
conventional procedures.
ESTIMATED ERROR:
$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
(estimated by compiler)
REFERENCES:
<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</pre>
2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.

COMPONENTS:			ORIGINAL MEASUREMENTS:	
1. N,N-Din	nethylmethanan chylamine); C -3]		Gerrard, W.	
<pre>2. N,N-Dimethylbenzenamine (N,N-dimethylaniline); C8H11N; [121-69-7]</pre>			Solubility of Gases and Liquids, Plenum <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
Pressure			C. L. Young	
EXPERIMENTAL VALUES:			l	
			Mole fraction of trimethylamine	
т/к	P/mmHg	<i>P/</i> 10⁵Pa	in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
			(CH <sub>3</sub> ) <sub>3</sub> N	
283.15	100	0.133	0.071	
203.15	200	0.267	0.149	
	300	0.400	0.235	
	400 500	0.533 0.667	0.328 0.422	
	600	0.800	0.535	
	700 760	0.933 1.013	0.660 0.744	
N		AUXILIARY	INFORMATION	
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:	
Amine was	passed into a	known weight	1. British Drug Houses or Cambrian	
			Gases sample.	
of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of absorbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].		f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures.	
			ESTIMATED ERROR:	
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	
			(estimated by compiler)	
			REFERENCES: 1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.	
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.	

			ORIGINAL MEASUREMENTS:	
	hylmethanami:	ne	Gerrard, W.	
(trimethylamine); C <sub>3</sub> H <sub>9</sub> N; [75-50-3]				
-	-		Solubility of Gases and Liquids,	
2. N,N-Diethylbenzenamine (N,N-diethylaniline); C <sub>10</sub> H <sub>15</sub> N; [91-66-7]			Plenum 1976, Chapter 10.	
VARIABLES:			PREPARED BY:	
Pressure			C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
		<u></u>		
283.15	100	0.133	0.083	
	200 300	0.267 0.400	0.165 0.255	
	400	0.533	0.352	
	500 600	0.667 0.800	0.454 0.560	
	700	0.933	0.673 0.750	
	760	1.013	0.750	
		AUXILIARY	INFORMATION	
METHOD/APPAR	ATUS/PROCEDURE:	AUXILIARY	INFORMATION SOURCE AND PURITY OF MATERIALS:	
Amine was of pure li total pres	passed into a quid in a bub	known weight bler tube at a by a manometer	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K. tus and proce	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample.	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K.	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K. tus and proce	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures.	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K. tus and proce	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K. tus and proce	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR:	
Amine was of pure li total pres assembly. gas was es temperatur to within The appara	passed into a quid in a bub sure measured The amount o timated by we e was manuall 0.2K. tus and proce	known weight bler tube at a by a manometer of absorbed tighing. The y controlled dure are	SOURCE AND PURITY OF MATERIALS: 1. British Drug Houses or Cambrian Gases sample. 2. Purified and attested by conventional procedures. ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$	

		IV, IV-Dimethy	/Imethanamine 223		
COMPONENTS	5:		ORIGINAL MEASUREMENTS:		
(T [7 2. Tric	Dimethylmethanamine, rimethylamine); C <sub>3</sub> H <sub>g</sub> 5-50-3] hloromethane, (chlor Cl <sub>3</sub> ; [67-66-3]	<sub>э</sub> м;	Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.		
VARIABLES					
Concentration			PREPARED BY: P. G. T. Fo	aa	
EXPERIMENT	TAL VALUES:	······································			
т/к	Concentration of C <sub>3</sub> H <sub>9</sub> N in solytion/ mol dm	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mm</sup>	Concentration of Hg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>x</sup> C <sub>3</sub> H <sub>9</sub> N	
298.2	0.1552 0.1995 0.276	4.82 6.14 8.84	598 593 580	0.0124 0.0158 0.0218	
ref.		lon that di Liquid phas	······································		
ref.	(1), on the assumpti	lon that di Liquid phas	ssolution of gas caused		
ref. change METHOD/APH The par amine al ions de measure (2) & (	(1), on the assumpti e of volume of the 1 PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratic d by a dynamic metho 3)). Mixtures of hy	AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. ydrogen and	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: rom Kahlbaum; as dried with	
ref. change METHOD/APF The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimeth in the hydroch changes	(1), on the assumpti e of volume of the 1 PARATUS/PROCEDURE: tial pressures of tr bove solutions of co termined by titratic d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solution ylamine. The trimet gas stream was absor loric acid and estim in electrical condu	AUXILIARY AUXILIARY oncentrat- on, were od (refs. ydrogen and olysis of were on of chylamine cbed in nated from activity	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH.	ALS: rom Kahlbaum; as dried with	
ref. change METHOD/APH The par amine al ions de measure (2) & ( oxygen, sodium 1 passed trimethy in the hydroch changes due to pacid. oxygen electro baromet copper	(1), on the assumpti e of volume of the 1 PARATUS/PROCEDURE: tial pressures of the bove solutions of co termined by titratic d by a dynamic metho 3)). Mixtures of hy produced by electro hydroxide solution, through each solutio, gas stream was absor loric acid and estim	AUXILIARY AUXILIARY cimethyl- oncentrat- on, were od (refs. ydrogen and olysis of were on of chylamine cbed in mated from ated from ated from ated from ated from ated from ated in by of by on of the ogen/ d by om the anges in a s with the	ssolution of gas caused e. INFORMATION SOURCE AND PURITY OF MATERI 1. Hydrated chloride f reacted with KOH; g NaOH. 2. From Kahlbaum; drie	ALS: rom Kahlbaum; as dried with	

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. N,N-Dimethylmethanamine	Gerrard, W.
(trimethylamine); C <sub>3</sub> H <sub>9</sub> N;	
[75-50-3]	Solubility of Gases and Liquids, Plenum, <u>1976</u> ,
2. Trichloromethane; CHCl <sub>3</sub> ;	Chapter $10.$
[67-66-3]	
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	Mole fraction of
	N, N-dimethylmethanamine
T/K P/mmHg P/10 <sup>5</sup>	Pa in liquid,
	<sup><i>x</i></sup> C <sub>3</sub> H <sub>9</sub> N
298.15 760 1.01	.3 0.554
298.15 786 1.03	5 0.554
	······································
······································	
AUXILIARY	INFORMATION
METHOD APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Amine was passed into a known weight	1. British Drug Houses or Cambrian
of pure liquid in a bubbler tube at	Gases sample.
a total pressure measured by a	2. Purified and attested by
manometer assembly. The amount of	conventional procedures.
absorbed gas was estimated by	
weighing. The temperature was	
manually controlled to within 0.2K.	
The apparatus and procedure are	ESTIMATED ERROR:
described by Gerrard (1,2).	$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$
	(estimated by compiler).
	· ····································
	REFERENCES:
	1. Gerrard, W.
	J. Appl. Chem. Biotechnol.
	<u>1972</u> , 22, 623-650.
	2. Gerrard, W.
	Solubility of Gases and Liquids,
	Plenum Press, New York. <u>1976</u> , Chapter 1.

		Imethanamine	225	
COMPONENTS:		ORIGINAL MEASUREMEN	VTS:	
2. Tetrachloromet	ne); C <sub>3</sub> H <sub>9</sub> N; [75-50-3]	Wolff, H.; Wür Ber. Bunsenges <u>1968</u> , 72, 101-	. Phys. Chem.	
VARIABLES: Composition	n, temperature	PREPARED BY: P. G. T. Fogg		
EXPERIMENTAL VALUES:		· · · · · · · · · · · · · · · · · · ·		
Variation o temperature and	of the total vapor pr d of mole fraction of	essure/Torr with C <sub>3</sub> H <sub>9</sub> N in the li	variation of quid phase, <sup>x</sup> C3 <sup>H</sup> 9 <sup>N</sup>	
		T/K		
°C,	3 <sup>H</sup> 9 <sup>N</sup> 253.15	273.15	293.15	
	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	33.0 51.0 73.6 90.6 114.8 139.8 166.1 190.9 221.5 227.2 259.5 296.5 330.1 372.0 414.0 445.6	90.5 130.4 177.1 218.6 269.8 322.6 378.7 425.0 491.9 501.7 564.4 639.8 700.6 787.1 855.9 924.2 Cont.	
	AUXILIARY	INFORMATION		
METHOD / APPARATUS / PROC	CEDURE :	SOURCE AND PURITY	OF MATERIALS:	
used (1), (2). I accurately known introduced into a thermostat contro The total vapor p measured by a mer contact between v avoided by using spiral manometer with pressure of against that of o taps were used so between vapor and The authors calcu coefficients of e the vapor pressur described by Bark for Redlich-Kiste evaluated and rep	billed to ± 0.02°C. pressure was cury manometer but vapor and mercury was a sensitive quartz as a null instrument vapor balanced arbon dioxide. Meta b as to avoid contact t tap grease. Hated activity each component from re data by a method cer (3). Constants er equations (4) were borted. The the vapor phase were	<pre>trimethylam repeatedly the first a: had vapor p differed by of error of measurement. 2. Merck "Uvast ESTIMATED ERROR: δT/K = ± 0.02 REFERENCES: 1. Wolff, H.; chem. 1962, 2. Wolff, H.; Bunsenges. P 874. 3. Barker, J.A. 6, 207. 4. Redlich, O.;</pre>	(estimated by authors) Höpfner, A. Z. Elektro.	

		74,74-Diniotryn	· · · · · · · · · · · · · · · · · · ·		
COMPONENTS:			ORIGINAL MEASUREME	ENTS:	
1. <i>N</i> , <i>N</i> -Dir	nethylmethanami	ne,	Wolff, H.; Würtz, R.		
	thylamine); C <sub>3</sub> H	í			
	5	-	<u>1968</u> , 72, 101-109.		
	loromethane (ca	1			
Lettadi	loride); CCl <sub>4</sub> ;	[50-23-5]			
EXPERIMENTAL	VALUES: Cont.	•			
			T/K		
	æ				
	<sup>ж</sup> с <sub>з</sub> н <sub>9</sub> м	253.15	273.15	293.15	
	0.753 0.801	206.7	488.2	1006.8	
	0.824	223.9 231.8	527.8 545.9	1088.6 1117.3	
	0.925	264.8	619.5	1269.5	
	1	289.2	675.8	1388.2	
		· · · · · · · · · · · · · · · · · · ·	5		
	760 Torr =	1  atm = 1.013	x 10° Pa		
_					
Co	nstants for cal Redlic		ctivity coeffic tions given bel		
	T/K	A	В	С	
	253.15	-0.882	-0.056	+0.077	
	263.15	-0.726	-0.081	+0.083	
	273.15	-0.640	-0.058	+0.051	
	283.15	-0.541	-0.064	+0.005	
	293.15	-0.489	-0.044	-0.011	
ln $f_1$	$= A x_2^2 -$	$Bx_2^2(1 - 4x)$	$_{1}) + C x_{2}^{2}(1)$	$-8 x_1 + 12 x_1^2$ )	
ln $f_2$	$= A x_1^2 +$	$B x_1^2 (1 - 4 x)$	$_{2}$ ) + $C x_{1}^{2}$ (1	$-8x_2 + 12x_2^2$ )	
where	$f_{1} = activit$	y coefficient	of trimethylam	nine	
	- <b>T</b>		of carbon tet		
	* 2	-		the liquid phase	
	L.			ide in the liquid	
	<sup>2</sup> phase			<b>-</b>	

COMPONENTS:			ORIGINAL MEASUREMENTS:		
	nethylmethana	-	Gerrard, W.		
(trimet	thylamine);	C <sub>3</sub> H <sub>9</sub> N;			
[75-50-	-3]		Solubility of Gases and Liquids,		
	Frichloroetha		Plenum 1976, Chapter 10.		
	-trichloro-2- 30; [115-20-	hydroxyethane);			
VARIABLES:	30, [115-20-	0]	PREPARED BY:		
Tem	perature, pr	essure	C. L. Young		
EXPERIMENTAL	VALUES				
EXTERITED	VALUED.		Mole fraction of trimethylamine		
		. <b>r</b>	in liquid,		
т/к	P/mmHg	<i>P/</i> 10⁵Pa	x (CH <sub>3</sub> ) <sub>3</sub> N		
			·····		
278.15	100	0.133	0.478		
2,00120	200	0.267	0.545		
	300	0.400	0.600 0.660		
	400 500	0.533 0.667	0.722		
	600	0.800	0.800		
	700	0.933	0.875		
283.15	760 100	1.013 0.133	0.930 0.454		
203.15	200	0.267	0.515		
	300	0.400	0.567		
	400 500	0.533 0.667	0.613 0.660		
	600	0.800	0.713		
	700	0.933	0.780		
	760	1.013	0.820 0.689		
293.15 298.15	760 760	1.013 1.013	0.654		
Į			-		
		AUXILIARY	INFORMATION		
	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
Amine was p	passed into a	known weight bler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>		
total press	guia in a bur sure measured	by a manometer			
assembly.	The amount of	of absorbed	2. Purified and attested by		
gas was est	timated by we	ighing. The	conventional procedures.		
temperature to within (	e was manuall	y controlled			
	tus and proce	dure are			
described b	by Gerrard [1	,2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W.		
			J. Appl. Chem. Biotechnol. 1972, 22		
			623-650. 2. Gerrard, W.		
			Solubility of Gases and Liquids.		
			Plenum Press, New York. 1976.		
			Chapter 1.		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
	methylmethana		Gerrard, W.		
(trime [75-50	thylamine); -3]	C <sub>3</sub> H <sub>9</sub> N;	Solubility of Gases and Liquids,		
	<pre>2. Bromobenzene; C<sub>6</sub>H<sub>5</sub>Br; [108-86-1] //ARIABLES:</pre>		<i>Plenum</i> , <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
Pressure EXPERIMENTAL VALUES:			C. L. Young		
<b>m</b> / 12		D (105D)	Mole fraction of trimethylamine in liquid,		
т/к	P/INMHg	<i>P/</i> 10 <sup>5</sup> Pa	x (CH <sub>3</sub> ) <sub>3</sub> N		
		<u></u>			
283.15	100 200	0.133 0.267	0.088 0.182		
	300	0.400	0.290		
	400 500	0.533 0.667	0.386 0.496		
	600	0.800	0.600		
	700 760	0.933 1.013	0.710 0.770		
		AUXILIARY	INFORMATION		
METHOD/APPAR	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
of pure li	quid in a bub	known weight bler tube at a	l. British Drug Houses or Cambrian Gases sample.		
assembly.	sure measured The amount c timated by we	by a manometer of absorbed	2. Purified and attested by		
	e was manuall		conventional procedures.		
to within The appara	tus and proce	dure are			
uescribed	by Gerrard [1	·,			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650.		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

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		N,N-Dimethyl	methanamine 22	
COMPONENTS :			ORIGINAL MEASUREMENTS:	
	nethylmethanam: thylamine); C		Gerrard, W.	
[75-50-		311911;	Solubility of Gases and Liquids,	
	<pre>2. Iodobenzene; C<sub>6</sub>H<sub>5</sub>I; [591-50-4] ARIABLES:</pre>		<i>Plenum</i> , <u>1976</u> , Chapter 10.	
VARIABLES:			PREPARED BY:	
	Pressure		C. L. Young	
EXPERIMENTAL	VALUES:			
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N	
· · · · · · · · · · · · · · · · ·				
283.15	100 200 300 400	0.133 0.267 0.400 0.533	0.100 0.202 0.303 0.398	
	500 600 700 760	0.667 0.800 0.933 1.013	0.502 0.606 0.715 0.780	
	• <del>• • • • •</del> ••	AUXILIARY	INFORMATION	
METHOD/APPARA	TUS/PROCEDURE:	<u> </u>	SOURCE AND PURITY OF MATERIALS:	
METHOD/APPARATUS/PROCEDURE: Amine was passed into a known weight of pure liquid in a bubbler tube at a total pressure measured by a manometer assembly. The amount of abosrbed gas was estimated by weighing. The temperature was manually controlled to within 0.2K. The apparatus and procedure are described by Gerrard [1,2].		er tube at a by a manometer abosrbed ghing. The	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> <li>Purified and attested by conventional procedures.</li> </ol>	
described b	.2K. us and procedu	ire are		
described b	.2K. us and procedu	ire are	ESTIMATED ERROR: $\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$ (estimated by compiler)	

COMPONENTS:		ORIGINAL MEASUREMENTS:		
<pre>1. N,N-Dimethylmethana   (trimethylamine);   [75-50-3]</pre>	mine C <sub>3</sub> H <sub>9</sub> N;	Gerrard, W. Solubility of Gases and Liquids,		
<pre>2. l-Bromo-3-methylbenzene (m-Bromotoluene); C<sub>7</sub>H<sub>7</sub>Br; [95-46-5] VARIABLES:</pre>		Plenum <u>1976</u> , Chapter 10.		
		· · · · · · · · · · · · · · · · · · ·		
		PREPARED BY:		
Pressure		C. L. Young		
EXPERIMENTAL VALUES:				
T/K P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	Mole fraction of trimethylamine in liquid, <sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N		
283.15 100 200	0.133 0.267	0.089 0.171		
300	0.400	0.261		
400 500	0.533 0.667	0.362 0.476		
600	0.800	0.590		
700 760	0.933 1.013	0.704 0.772		
	AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
Amine was passed into a of pure liquid in a bubl total pressure measured	oler tube at a	l. British Drug Houses or Cambrian Gases sample.		
assembly. The amount of gas was estimated by we temperature was manually to within 0.2K. The apparatus and proceed described by Gerrard [1,	f absorbed ighing. The y controlled dure are	2. Purified and attested by conventional procedures.		
		ESTIMATED ERROR:		
		$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
		(estimated by compiler)		
		REFERENCES:		
		<ol> <li>Gerrard, W.</li> <li>J. Appl. Chem. Biotechnol. <u>1972</u>, 22, 623-650.</li> </ol>		
		<ol> <li>Gerrard, W. Solubility of Gases and Liquids, Plenum Press, New York. <u>1976</u>, Chapter. 1.</li> </ol>		

COMPONENT	S:		ORIGINAL MEASUREMENTS:		
<pre>1. N, N-Dimethylmethanamine, (Trimethylamine); C<sub>3</sub>H<sub>9</sub>N; [75-50-3] 2. 1-Bromo-naphthalene; C<sub>10</sub>H<sub>7</sub>Br; [90-11-9]</pre>			Halban, H. Z. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.		
				·····	
VARIABLES			PREPARED BY:		
Concentration			P. G. T. Fc	9 <b>3</b> 3	
EXPERIMEN	TAL VALUES:	<u> </u>	I		
т/К	Concentration of C <sub>3</sub> H <sub>9</sub> N in solution/ mol dm	<sup>p</sup> C <sub>3</sub> H <sub>9</sub> N <sup>/mi</sup>	Concentration of hHg C <sub>3</sub> H <sub>9</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>°C</sup> 3 <sup>H</sup> 9 <sup>N</sup>	
298.2	0.1206	47.7	47.0	0.0166	
	0.1456	60.0	45.1	0.0199	
	0.201	84.0	44.4	0.0273	
ref.	ulated by the compile (1), on the assumpti ge of volume of the 1	on that di	the density of the solve ssolution of gas caused se.	ent given in I negligible	
ref.	(1), on the assumpti	on that di	ssolution of gas caused	ent given in I negligible	
ref. chang METHOD/AP The par amine a ions de measure (2) & oxygen, sodium passed trimeth in the hydroch changes	(1), on the assumpti	AUXILIARY AUXILIARY imethyl- oncentrat- on, were od (refs. rogen and olysis of were on of chylamine bed in lated from octivity	ssolution of gas caused se.	ALS: Trom Kahlbaum; Jas dried with	

		N,N-Dimetry			
COMPONENTS:			ORIGINAL MEASUREMENTS:		
(trime	methylmethanam thylamine); C		Gerrard, W.		
[75-50	-		Solubility of Gases and Liquids,		
<pre>2. 1-Bromonaphthalene; C10H7Br; [90-11-9]</pre>		$C_{10}H_7Br;$	<i>Plenum</i> <u>1976</u> , Chapter 10.		
VARIABLES:			PREPARED BY:		
Pressure			C. L. Young		
EXPERIMENTAL	VALUES:				
			Mole fraction of trimethylamine		
т/к	P/mmHg	<i>P/</i> 10 <sup>5</sup> Pa	in liquid,		
	- /	-,2010	<sup>x</sup> (CH <sub>3</sub> ) <sub>3</sub> N		
298.15	100	0.133	0.050		
	200 300	0.267 0.400	0.096 0.141		
	400	0.533	0.192		
	500 600	0.667 0.800	0.240 0.293		
	700	0.933	0.345		
	760	1.013	0.380		
		AUXILIARY	INFORMATION		
METHOD/APPAR.	ATUS/PROCEDURE:		SOURCE AND PURITY OF MATERIALS:		
	passed into a		1. British Drug Houses or Cambrian		
	quid in a bubb sure measured		Gases sample.		
gas was es temperatur to within		ghing. The controlled	2. Purified and attested by conventional procedures.		
described	tus and proced by Gerrard [1,	2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			REFERENCES:		
			1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u> , 22 623-650		
			2. Gerrard, W. Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter 1.		

COMPONENTS:			ORIGINAL MEASUREMENTS:		
COMPONENTS:					
	thylmethanam		Gerrard, W. Solubility of Gases and Liquids,		
[75-50-3	ylamine); C	3H9N;			
	-	<b>a</b> a)			
<pre>2. 1-Chloronaphthalene; C10H7Cl; [90-13-1] VARIABLES: Pressure</pre>			<i>Plenum</i> , <u>1976</u> , Chapter 10.		
			PREPARED BY:		
			C. L. Young		
EXPERIMENTAL V	ALUES:				
5					
			Mole fraction of trimethylamine		
т/к	P/mmHg	<i>P/</i> 10⁵Pa	in liquid,		
			x (CH <sub>3</sub> ) <sub>3</sub> N		
293.15	100 200	0.133 0.267	0.043 0.090		
	300	0.400	0.132		
	400 500	0.533 0.667	0.178 0.228		
	600	0.800	0.278		
4	700 760	0.933 1.013	0.332 0.365		
•	760	1.013	0.303		
			-		
		AUXILIARY	INFORMATION		
METHOD /ADDADAT	US (PROCEDURE .				
METHOD/APPARAT			SOURCE AND PURITY OF MATERIALS;		
Amine was pa of pure ligu	ssed into a l id in a bubb	ler tube at a	<ol> <li>British Drug Houses or Cambrian Gases sample.</li> </ol>		
total pressu	re measured )	oy a manometer	2 Durified and attacked by		
	he amount of mated by weig		2. Purified and attested by conventional procedures.		
temperature	was manually	controlled	_		
to within 0. The apparatu	s and procedu	ire are			
described by	Gerrard [1,	2].			
			ESTIMATED ERROR:		
			$\delta T/K = \pm 0.1;  \delta x/x = \pm 3\%$		
			(estimated by compiler)		
			(Catimatica by compiler)		
			REFERENCES:		
			<pre>1. Gerrard, W. J. Appl. Chem. Biotechnol. <u>1972</u>, 22 623-650.</pre>		
			2. Gerrard, W.		
			Solubility of Gases and Liquids. Plenum Press, New York. <u>1976</u> . Chapter l.		

,

COMPONENTS: 1. Methan-d <sub>3</sub> -amine; CH <sub>3</sub> D <sub>2</sub> N; [5581-55-5] Methanamine-d <sub>2</sub> ; CH <sub>3</sub> D <sub>2</sub> N; [2614-35-9] Methanamine-d <sub>5</sub> ; CD <sub>5</sub> N; [3767-37-1] Ethanamine-d <sub>2</sub> ; C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> N; [5852-45-0] N-methylmethanamine-d; C <sub>2</sub> H <sub>6</sub> DN; [917-72-6] N-(Methyl-d <sub>3</sub> )-methan-d <sub>3</sub> -amine; C <sub>2</sub> HD <sub>6</sub> N; [14802-36-9] N-(Methyl-d <sub>3</sub> )-methan-d <sub>3</sub> -amine-d; C <sub>2</sub> D <sub>7</sub> N; [22024-52-8] 1-Propanamine-d <sub>2</sub> ; C <sub>3</sub> H <sub>7</sub> ND <sub>2</sub> ; [25837-80-3] 2-Propanamine-d <sub>2</sub> ; C <sub>3</sub> H <sub>7</sub> ND <sub>2</sub> ; [7395-10-0]	EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London N7 8DB, United Kingdom. October 1983
2. Organic liquids	
CRITICAL EVALUATION:	
The variation of total vapor pressure with var been measured by Wolff <i>et al.</i> (1-6) for soluti propanamines, <i>N</i> -deuterated ethanamine and deut in hexane. In addition measurements have bee ethanamine in butane and on <i>N</i> -deuterated metha methanamine. In each case the variation of p component with variation of composition may be values for the system containing the correspon also studied by Wolff <i>et al.</i>	ons of deuterated methanamines, erated N-methylmethanamines n made on N-deuterated namine in N,N-dimethyl- artial pressure of either calculated and compared with
The relative solubilities of a deuterated and deuterated amine in the same solvent depent up partial pressure. Differences may be up to a been discussed by Wolff $et \ all$ . in terms of rel the same mole fraction concentration.	on the temperature and the bout 10%. Differences have
On the basis of the systems which have been st concentrations, amines which have deuterium at groups are more volatile than the correspondin the same conditions. At low concentrations m which have deuterium atoms substituted on the volatile than the corresponding amines contain However this does not hold for the 1- and 2-pr at the same partial pressure and temperature, be less soluble than the corresponding non-deu $et \ al$ . showed that differences may be due to c quencies causing changes in partition function between condensed and gaseous state.	oms substituted into methyl g unsubstituted amines under ost of the amines studied nitrogen atom are also more ing =NH or -NH <sub>2</sub> groups. opanamines. It follows that, the deuterated compound may terated compound. Wolff hanges in vibrational fre-
Increase in concentration causes the partial $p$ amine to decrease relative to that of the corr pound. The effect is more marked the lower to to the <i>N</i> -deuterated compound having the greater partial pressure and temperature. Wolff <i>et a</i> due to <i>N</i> -deuterated amines having a greater ter liquid phase than the corresponding <i>N</i> -hydrogen by deuterium atoms is stronger than hydrogen be that effects due to association are likely to <i>N</i> temperature and increase in concentration. There appears to be no investigations of phase	esponding N-hydrogen com- he temperature and may lead r solubility at the same l. considered that this was ndency to associate in the compounds because bonding onding. It was pointed out be enhanced with decrease in
amine systems by other workers for comparison we however, in the opinion of the evaluator, this of high standard and should be accepted as related as rela	with the work of Wolff <i>et al.</i> work is self-consistent and
References	
1. Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1965</u> , 69, 71	10-716.
2. Wolff, H.; Höpfner, A.	
Ber. Bunsenges. Phys. Chem. <u>1967</u> , 71, 40 3. Wolff, H.; Hoppel, HE.	
Ber. Bunsenges. Phys. Chem. <u>1966</u> , 70, 8 4. Wolff, H.; Würtz, R.	
Ber. Bunsenges. Phys. Chem. <u>1968</u> , 72, 10 5. Wolff, H.; Würtz, R.	
Z. Phys. Chem. (Frankfurt am Main) <u>1969</u> 6. Wolff, H.; Shadiakhy, A.	
Fluid Phase Equilibria <u>1983</u> , 11, 267-28 <sup>-</sup>	7.

COMPONENTS:			IODICINAL MEACH	TATIMA .		
<pre>l. Methan-d<sub>3</sub>-amine; CH<sub>2</sub>D<sub>3</sub>N;</pre>			ORIGINAL MEASUREMENTS:			
	• -	<sup>3</sup> <sup>N</sup> ;	Wolff, H.; Höpfner, A.			
[5581-	-55-5]		Ber. Bunsenges. Phys. Chem. <u>1967</u> , 71, 461 <b>-</b> 466.			
2. Hexane:	C <sub>6</sub> H <sub>14</sub> ; [110-9	54-31				
	6 14					
VARIABLES:			PREPARED BY:			
Compo	osition, tempe	erature	1 :	P. G. T. Fogg		
EXPERIMENTAL V	IAT HES .	· · · · · · · · · · · · · · · · · · ·	<u> </u>			
Varia	ation of the f re and of mole	total vapor pr	cH D N in th	with variation	n of	
cemperatur	e and or more	ITACLION OL	2231 11 11	e iiquiu phase	<sup>e</sup> , <sup>x</sup> CH <sub>2</sub> D <sub>3</sub> N	
			T/K			
<i>m</i>						
<sup>x</sup> CH <sub>2</sub> D <sub>3</sub> N	218.15	233.15	253.15	273.15	293.15	
0 0.00905	1.4 7.9	3.8 16.0	14.1 39.1	45.2 90.1	120.8 192.8	
0.0187	13.8	27.7	64.5	135.3	267.1	
0.0392	23.5	48.6	110.7	223.3	414.7	
0.0725	32.2	71.3	170.2	343.9	627.5	
0.1023	37.0	85.0	209.4	433.3	793.7	
0.128	39.5	93.2 97.3	235.8	497.0	919.0	
0.145 0.185	40.6 42.1	104.4	250.6 278.6	532.6 607.6	990.2 1150.9	
0.216	43.2	108.3	294.6	653.3	1253.2	
0.263	44.2	112.5	313.1	704.8	1372.2	
0.305	45.0	115.2	324.4	746.4	1464.5	
0.340	45.0 45.1 45.2	116.9	333.8	746.4 774.4	1538.8	
0.379 0.419	45.2 45.5	118.1 119.5	341.4 347.5	800.6 824.3	1611.6 1677.2	
0.419	45.5		352.5	841.7		
0.488	45.9	120.7	356.5	856.7	1771.3	
0.517	45.9	121.4	358.9	868.0	1804.9	
				Cor	nt.	
			THEODY	-		
		AUXILIARY	INFORMATION			
METHOD /APPARAT	US/PROCEDURE:		SOURCE AND PUR	ITY OF MATERIALS	:	
Apparatus d	lescribed prev	viously was	1. CD_NH_C1	from Merck wa	as treated	
used (1).	Liquid mixtur	es of	with KOH	and gave CD,	NH, which	
accurately	known composi	tion were	was puri:	fied by repeat	teđ	
introduced	into a cell h	held in a + 0.02°C	fraction	ation as for (	$^{CH}3^{ND}2^{(4)}$	
The total r	controlled to pressure was n	b = 0.02 C.	2. Supplied	by Fluka; pu	ritv	
a mercury n			99.96 mo			
-						
	s calculated a ts of each com					
	cribed by Bark					
Constants f	for Redlich-Ki	ster (3)				
	for activity of		ESTIMATED ERRO			
were evalua	ated and repor	ted.	$\delta T/K = \pm 0.0$	02 (estimate	ed by authors	
			DEFEDENCIA			
			REFERENCES:	; Höpfner, A.	2. Elektro-	
				52, 66, 149.	L. DUCKULU-	
			2. Barker,	J.A. Aust. J.	Chem. <u>1953</u> ,	
			6, 207.	0 . 11 - 1		
				O.; Kister, <i>1</i> <u>48</u> , <i>21</i> , 345.	A.T. INA. Eng	
			4. Wolff, H	.; Höpfner, A.	. Ber. Bunsen-	
				s. Chem. 1965		

COMPONENTS:			ORIGINAL MEASUREMENTS:			
1. Methan-d <sub>3</sub> -amine; CH <sub>2</sub> D <sub>3</sub> N;			Wolff, H.; Höpfner, A.			
[5581-55-5]			Ber. Bunser	Ber. Bunsenges. Phys. Chem.		
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [110-5	54-3]	<u>1967</u> , 71, 4	61-466.		
	0 14					
ARIABLES:		••• <u>•••••</u>	PREPARED BY:	· · · · · · · · · · · · · · · · · · ·	<u></u>	
Composition, temperature			I	P. G. T. Fogg		
EXPERIMENTAL V	ALUES: Cont.	<u></u>		<u></u>		
<sup>∞</sup> CH <sub>2</sub> D <sub>3</sub> N	218.15	233.15	253.15	273.15	293.15	
0.540	46.2	121.6	360.9	876.8	1829.2	
0.571	45.6	121.6	363.6 366.4	887.1 896.1	1861.6 1889.5	
0.601 0.623	45.9 45.7	121.9 122.4	367.7	902.7	1909.6	
0.641	45.7	122.5	368.5	906.3	1917.8	
0.709	45.9	123.4	373.5	925.8	1979.0	
0.715	45.8	122.9	373.8 379.3	927.9 946.4	1986.5 2039.6	
0.785 0.853	45.7 46.0	124.4 125.3	384.8	966.8	2035.0	
0.897	46.1	126.4	389.4	982.0	2132.4	
0.946	47.0	128.4	396.2	1003.0	2186.5	
1	48.0	131.5	407.4	1033.3	2256.4	

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Methan-d<sub>3</sub>-amine; CH<sub>2</sub>D<sub>3</sub>N; [5581-55-5]</pre>	Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem.
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	<u>1967</u> , 71, 461-466.

EXPERIMENTAL VALUES:

	the Redl	ich-Kister eq	uations giver	h below	
т/К	А	В	С	D	E
218.15	2.385	0.094	0.421	-0.012	0.106
223.15	2.338	0.107	0.413	+0.072	0.136
233.15	2.208	0.121	0.351	+0.074	0.080
243.15	2.087	0.147	0.301	+0.093	0.069
253.15	1.959	0.165	0.268	+0.094	0.043
263.15	1.832	0.179	0.231	+0.090	0.027
273.15	1.708	0.191	0.206	+0.080	0.006
283.15	1.585	0.200	0.188	+0.074	-0.006
293.15	1.467	0.203	0.179	+0.067	-0.022

Constants for calculation of activity coefficients from

$$\ln f_{1} = A x_{2}^{2} - B x_{2}^{2} (1 - 4 x_{1}) + C x_{2}^{2} (1 - 8 x_{1} + 12 x_{1}^{2}) - D x_{2}^{2} (1 - 12 x_{1} + 36 x_{1}^{2} - 32 x_{1}^{3}) + E x_{2}^{2} (1 - 16 x_{1} + 72 x_{1}^{2} - 128 x_{1}^{3} + 80 x_{1}^{4}) \ln f_{2} = A x_{1}^{2} + B x_{1}^{2} (1 - 4 x_{2}) + C x_{1}^{2} (1 - 8 x_{2} + 12 x_{2}^{2}) + D x_{1}^{2} (1 - 12 x_{2} + 36 x_{2}^{2} - 32 x_{2}^{3}) + E x_{1}^{2} (1 - 16 x_{2} + 72 x_{2}^{2} - 128 x_{2}^{3} + 80 x_{2}^{4})$$
where  $f_{1}$  = activity coefficient of methan-d<sub>3</sub>-amine   
  $f_{2}$  = activity coefficient of hexane   
  $x_{1}$  = mole fraction of methan-d<sub>3</sub>-amine in the liquid phase

 $x_2$  = mole fraction of hexane in the liquid phase

COMPONENTS:		ORIGINAL MEASUREM	ENTS:	
<pre>1. Methanamine-d<sub>2</sub>; CH<sub>3</sub>D [2614-35-9] 2. Hexane; C<sub>6</sub>H<sub>14</sub>; [110-1</pre>		Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1965</u> , 69, 710-716.		
VARIABLES:				
Composition, temper	cature	PREPARED BY:	G. T. Fogg	
EXPERIMENTAL VALUES:			······································	····
Variation of the total and of mole fract:	ion of CH <sub>3</sub> D <sub>2</sub> N	/Torr with vari in the liquid p /K	lation of tem phase, <sup>x</sup> CH <sub>3</sub> D <sub>2</sub>	perature N
<sup>x</sup> CH <sub>3</sub> D <sub>2</sub> N 218.15	233.15	253.15	273.15	293.15
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	28.9 44.1 52.4 60.8 66.7 75.9 82.4 89.3 94.4 98.6 100.6 103.5	66.8 102.2 122.4 144.7 161.3 189.8 211.7 237.3 257.1 274.2 286.2 300.3	45.4 96.9 140.3 207.5 247.2 294.1 330.6 393.3 447.7 513.2 568.6 620.5 657.8 704.7 729.2 758.9 778.8 794.5	121.0 204.0 275.1 388.6 458.0 540.7 606.3 724.7 830.1 965.9 1086.2 1204.7 1292.0 1411.9 1474.9 1558.6 1613.6 1660.8 Cont.
	AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE: Apparatus described previ used (1). Liquid mixture accurately known composit introduced into a cell he thermostat controlled to The total vapor pressure by a mercury manometer. The authors calculated ac coefficients of each comp method described by Barke Constants for Redlich-Kis for activity coefficients evaluated and reported.	es of ion were eld in a ± 0.02°C. was measured etivity ponent by a er (2). ter equations	<pre>first and 1 pressures v than 0.5 To scopic meas the product A Material of over P<sub>2</sub>O<sub>5</sub>; ly fraction last fracti pressures a manometer ( ESTIMATED ERROR:</pre>	Com CH <sub>3</sub> NH <sub>2</sub> an fractionated last fraction which differe orr at 20°C. surements ind twas 98-99% high purity distilled an ated until f ons had the is indicated by (estimated by bpfner, A. 2. 66, 149. . Aust. J. Ch	until s had vapor d by less Spectro- icated that pure. ; dried d repeated- irst and same vapor by a y authors) . Elektro- hem. <u>1953</u> , F. Ind.

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	5		suterated Annies		23
COMPONENTS:	<u> </u>		ORIGINAL MEASURE	MENTS:	
1. Methanam	nine-d <sub>2</sub> ; CH <sub>3</sub> D <sub>2</sub> N;	;	Wolff, H.; H		
[2614-			Ber. Bunsenges. Phys. Chem.		
) Noveres	0 4		<u>1965</u> , <i>69</i> , 71	0-716.	
<pre>2. Hexane;</pre>	C <sub>6</sub> <sup>H</sup> 14; [110-54-	-3]			
VARIABLES:			PREPARED BY:		
Compo	osition, tempera	ature	P. G. T. Fogg		
EXPERIMENTAL V	/ALUES: Cont.				
			Т/К		
<sup>∞</sup> CH <sub>3</sub> D <sub>2</sub> N	218.15	233.15	253.15	273.15	293.15
0.535	40.0	108.3	329.9	815.6	1727.1
0.567 0.629	39.9 40.3	108.5 109.1	331.8 336.0	824.1 840.7	1753.0 1805.6
0.680	40.2	109.4	339.0	853.3	1842.6
0.730	40.0	110.4	341.2	864.5 881.6	1876.5 1928.3
0.802 0.872	40.3 40.1	110.6 111.4	346.3 351.0	899.7	1928.3
0.918	40.4	112.5	355.9	915.2	2021.5
0.957 0.972	41.1 41.2	114.0 114.5	361.0 363.5	930.7 937.6	2059.4 2074.8
1	41.4	116.1	368.7	950.2	2107.7
Co	T/K 218.15 223.15 228.15 233.15	2h-Kister equ A 2.460 2.377 2.320 2.252	B 0.141 0.110 0.124 0.122	C 0.601 0.508 0.458 0.405	-
	243.15 253.15	2.135 2.008	0.148 0.166	0.325 0.269	
	263.15	1.884	0.185	0.221	
	273.15 283.15	1.764 1.640	0.201 0.207	0.190 0.163	
	293.15	1.519	0.211	0.142	
$\ln f$ ,	$= A x_2^2 - B$	$x_{0}^{2}(1 - 4 x_{0})$	) + $C x_{2}^{2}(1)$	$-8 x_{-} + 12 x_{-}$	2)
	$= A x_1^2 + B$				
where f	= activity co	- efficient of	- methanamino-d	-	
	1 = activity co 2 = activity co 1 = mole fracti 2 = mole fracti	efficient of on of methan on of hexane	hethanamine-d hexane amine-d in th in the liquid	'2 ne liquid phas N phase	e

Solubilities of Deuterated Amines

240	0		euterateu Amines			
COMPONENTS:			ORIGINAL MEASUREMENTS:			
1. Methana	amine-d <sub>5</sub> ; CD <sub>5</sub> N;	[3767-37-1]	Wolff, H.; Höpfner, A.			
			Ber. Bunsenges. Phys. Chem.			
2. nexalle	; C <sub>6</sub> H <sub>14</sub> ; [110-54		<u>1967</u> , 71, 461	L-466.		
VARIABLES:			PREPARED BY:			
Com	position, temper	ature	Р.	G. T. Fogg		
EXPERIMENTAL						
Variation	of the total va and of mole f	por pressure raction of C	/Torr with vari D <sub>5</sub> N in the liqu	Lation of tempe uid phase.	erature	
			т/к			
<sup>x</sup> CD <sub>5</sub> N	218.15	233.15	253.15	273.15	293.15	
					1 21 0	
0.0112	1.0 9.4	3.7 19.2	14.3 45.8	45.4 101.7	121.0 211.1	
0.0221	15.7	32.1	73.6	152.7	295.4	
0.0329	20.6	42.8	98.5 119.8	199.7 242.2	373.6	
0.0434	24.3 27.2	51.9 59.2	139.5	281.7	516.3	
0.0639	29.8	65.6	156.2	317.3	579.6	
0.0737	31.4	70.7	171.4	350.1	638.8	
0.0878	33.7	77.1	190.4	392.7	719.5	
0.1016	35.0 36.3	82.2 86.2	206.9 219.4	431.1 462.1	792.6 854.2	
0.114 0.154	38.6	94.9	252.2	547.7	1032.0	
0.191	40.0	100.3	274.1	609.4	1167.6	
0.238	40.9	105.0	294.4	668.8	1306.7	
0.239	40.9	105.1	294.7	670.1 702.5	1311.2	
0.274	41.0 41.6	107.2 108.5	304.7 313.0	732.5	1463.7	
0.336	41.2	109.2	318.8	753.3	1519.0	
0.393	41.6	110.7	327.5	785.4	1609.9	
				Cont.		
		AUXILIARY	INFORMATION	<u>,</u>		
METHOD/APPARA	ATUS/PROCEDURE:	<u> </u>	SOURCE AND PURITY	OF MATERIALS:		
Apparatus	described previ	ougly was	I CD NH CI fr	om Merck was t	reated	
	Liquid mixture			give CD <sub>2</sub> NH <sub>2</sub> w		
	y known composit		then allowe	ed to react ŵit	h D <sub>2</sub> 0 to	
	d into a cell he			. Purificatio		
The total	t controlled to vapor pressure	± 0.02 C. Was	$CH_3ND_2$ (4).	actionation as	IOT	
	by a mercury man		32			
[				FLUKA A.G.;p	ourity	
	rs calculated ac		99.96 mol %	•		
	nts of each comp scribed by Barke					
Constants	for Redlich-Kis	ter(3)	NOTINATID PROF			
	for activity co		ESTIMATED ERROR:		ļ	
were evalu	lated and report	ed.	$\delta T/K = \pm 0.02$	(authors' esti	mate)	
			REFERENCES:	***		
				Höpfner, A. Z.	Elektro-	
			<i>chem</i> . <u>1962</u> , 2. Barker, J.A	. Aust. J. Che	m, 1953.	
			6, 207.			
			3. Redlich, O.	; Kister, A.T.	Ind. Eng.	
			Chem. <u>1948</u> , 4 Wolff H:	21, 345. Höpfner, A. Be	n Runcon-	
			ges. Phys.	<u>Chem. 1965, 69</u>	,710.	
			ges. Phys.	Chem. 1965, 69	,710.	

COMPONENTS:	<u></u>		ORIGINAL MEASUREM	ENTS:		
1. Methanamine-d <sub>5</sub> ; CD <sub>5</sub> N; [3767-37-1]			Wolff, H; Höpfner, A.			
			Ber. Bunsenges. Phys. Chem.			
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [110-5	4-3]	1967, <i>71</i> , 461-466.			
			<u>1907</u> , 71, 401	-400.		
VARIABLES:			PREPARED BY:			
Compos	ition, temper	ature	Р.	G. T. Fogg		
EXPERIMENTAL VA	ALUES: Cont.					
			т/к			
<sup>∞</sup> cd <sub>5</sub> n	218.15	233.15	253.15	273.15	293.15	
0,436	41.0	111.0	332.8	806.1	1666 0	
0.452	41.6	111.8	334.5	812.5	1666.0 1684.9	
0.479	41.2	111.8	337.3	823.0	1717.0	
0.522	41.2	112.5	341.4	838.3	1764.6	
0.561	41.5	112.7	343.7	849.7	1801.6	
0.613	41.6	113.0	346.7	863.7	1841.6	
0.663	41.7 41.7	113.5 114.3	349.3 353.0	877.0	1885.4	
0.786	41.8	114.4	357.0	889.3 905.4	1922.0 1973.4	
0.838	41.6	115.0	360.6	919.0	2011.6	
0.910	42.3	116.5	367.3	942.4	2075.1	
0.942	42.6	118.0	371.6	954.3	2105.5	
0.979	42.9	119.4	377.5	972.0	2146.3	
1	43.2	120.2	380.4	981.6	2170.4	
· · · · · · · · · · · · · · · · · · ·	760 Torr	= 1 atm = 1.0	13 x 10 <sup>5</sup> Pa.			
Co			activity coeff uations given h			
т/к	A	В	с	D	E	
218.15	2.456	0.050	0.445	0.140	0.275	
223.15	2.399	0.089	0.436	0.087	0.177	
233.15	2.272	0.106	0.372	0.100	0.123	
243.15	2.141	0.134	0.329	0.092	0.071	
253.15	2.018	0.157	0.290	0.107	0.054	
263.15	1.886	0.170	0.245	0.099	0.030	
273.15	1.763	0.184	0.212	0.096	0.024	
283.15 293.15	1.639 1.519	0.196 0.195	0.192 0.163	0.093 0.091	0.010 0.011	
 ln <i>f</i> .	$=$ A $x_2^2$ -	$B x_2^2 (1 - 4)$	$x_1) + C x_2^2$	$-8 x_1 + 12 x_2$	;, <sup>2</sup> )	
- <b>T</b>	<b>_</b>		$6 x_1^2 - 32 x_1^3$		-	
1						
	$+ E x_2^{2}$ (	$1 - 16 x_1 + 7$	$2 x_1^2 - 128 x_1^3$	$+ 80 x_{1}$		
$\ln f_2$	$= A x_1^2 +$	$B x_1^2 (1 - 4)$	$x_2$ ) + C $x_1^2$ (1)	$-8x_2 + 12x_2$	;2 <sup>2</sup> )	
	+ $D x_1^2$ (	$1 - 12 x_{2} + 3$	$6 x_2^2 - 32 x_2^3$ )			
	~	_	$2x_2^2 - 128x_2^3$			
where $f$	, = activit	y coefficient	of methanamine	a-d <sub>r</sub>		
	$f_{2} = activit$			2		
	<i>4</i>			1 h a 1 1		
			hanamine-d <sub>5</sub> in		se	
x	$_2$ = mole fr	action of hex	ane in the liqu	id phase.		

	ORIGINAL MEASUREMENTS:			
	Wolff,H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. 1965, 69, 710-716.			
140 J4 J]				
	PREPARED BY:			
emperature		P. G. T. H	çodd	
			······································	
Variation of the total vapor pr temperature and of mole fraction of C			ation of <sup>bhase, x</sup> C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> N	
	т/к			
233.15	253.15	273.15	293.15	
11.0 12.9 18.2 20.0 24.6 25.0 26.7 28.1 27.6 28.3 28.9 29.2 29.6 30.1 30.7 31.0	33.0 38.9 55.1 62.7 79.4 83.4 88.9 93.4 94.0 97.2 99.7 100.5 102.9 105.9 107.5 110.1	45.9 67.9 85.5 98.6 138.3 158.2 207.2 218.2 239.9 249.7 254.6 264.1 273.5 275.8 284.1 294.0 299.7 307.5 314.1	121.1 162.4 196.0 221.4 301.9 344.7 458.1 486.3 540.6 564.6 577.3 604.9 629.3 636.4 659.5 686.2 701.3 725.8 741.8 Cont.	
AUXILIARY	INFORMATION	1		
previously was ixtures of mposition were ell held in a ed to ± 0.02°C. ssure was ry manometer. ted activity h component by a Barker (2). ch-Kister ity coefficients	<pre>1. Prepa: repea: and la press: Torr a measu: produce 2. Mater fract: fract: fract: press: manome ESTIMATED &amp;T/K = : REFERENCES 1. Wolfff chem. 2. Barke: 6, 20 3. Redlice</pre>	red from C <sub>2</sub> H <sub>5</sub> tedly fraction ast fractions ures which di at 20°C. Spe rements indic ct was at lea ial of high p P205; distill ionated until ions had the ures as indic eter (1). ERROR: t 0.02 (estim 5: , H.; Höpfner <u>1962, 66, 14</u> r, J.A. Aust. 7. ch, O.; Kiste	NH <sub>2</sub> and D <sub>2</sub> O; nated until first had vapor ffered by 0.4 ctroscopic ated that the st 99% pure. urity; dried ed and repeatedly first and last same vapor ated by a ated by authors) , A. Z. Elektro- 9. J. Chem. <u>1953</u> , r, A.T. Ind. Eng.	
	2 <sup>H</sup> 5 <sup>D</sup> 2 <sup>N</sup> ; 110-54-3] emperature the total vapor p nole fraction of o 233.15 3.9 8.0 11.0 12.9 18.2 20.0 24.6 25.0 26.7 28.1 27.6 28.3 28.9 29.2 29.6 30.1 30.7 31.0 31.7	$2^{H_5}D_2N;$ ORIGINAL M Ber.Bun 110-54-3]110-54-3]1965, 69emperature1965, 69preparaturePREPARED Bthe total vapor pressure/To nole fraction of $C_{2H_5}D_2N$ in T/K233.15253.153.914.68.025.011.033.012.938.918.255.120.062.724.679.425.083.426.788.928.193.427.694.028.397.229.2100.529.6102.930.1105.930.7107.531.0110.131.7112.1AUXILIARY INFORMATIONESOURCE ANDAUXILIARY INFORMATIONESOURCE ANDInterparatureAUXILIARY INFORMATIONESOURCE ANDInterparatureAUXILIARY INFORMATIONColspan="2">SOURCE ANDInterparatureSOURCE ANDInterparatureSOURCE ANDInterparatureSOURCE ANDInterparatureSOURCE ANDInterparatureSOURCE ANDInterparatureSOURCE AND<	PH_5D_2N;ORIGINAL MEASUREMENTS: Wolff,H.; Höpfner, A. Ber. Bunsenges. Phys.110-54-3]1965, 69, 710-716.smperaturePREPARED BY:preperatureP. G. T. Ir/K233.15253.15233.15253.15273.153.914.645.98.025.067.911.033.085.512.938.998.618.255.1138.320.062.7158.224.679.4207.225.083.4218.226.788.9239.928.193.4249.727.694.0254.628.397.2264.128.499.7273.529.2100.5275.829.6102.9284.130.1105.9294.030.7107.5299.731.0110.1307.531.7112.1314.1Auxiliary INFORMATIONEt:SOURCE AND PURITY OF MATEAuxiliary INFORMATIONEt:SOURCE AND PURITY OF MATEAuxiliary INFORMATIONEt:SOURCE AND PURITY OF MATEAuxiliary INFORMATIONEt:SOURCE AND PURITY OF MATEPreviously was ixtures of mposition were eli held in a ed to ± 0.02°C.sure was moduct was at lea <td c<="" td=""></td>	

	Solubilities of L		100	4	
COMPONENTS :	<u></u>	ORIGINAL MEASUREMENTS:			
1. Ethanamine-d <sub>2</sub> ; C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> I	N;	Wolff,H.; Höpfner, A.			
[5852-45-9]		Ber. Bunsenges. Phys. Chem.			
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-5	4-31	<u>1965</u> , 69,	710-716.		
20 monume, 0 <sub>6</sub> -14, (110 3)	1 21				
VARIABLES:		PREPARED BY:			
		FREFARED DI;			
Composition, Tempera	ature		P. G. T. Fog	а	
EXPERIMENTAL VALUES: Cont.		<u> </u>	···		
		m /11			
~		T/K			
<sup>x</sup> С <sub>2</sub> <sup>H</sup> 5 <sup>D</sup> 2 <sup>N</sup> 23	33.15 2	253.15	273.15	293.15	
0.793 - 3	32.1	L14.7	323.9	767.0	
0.832 3	32.5 ]	L16.5	329.6	782.8	
		L19.6 L23.9	339.2 352.2	806.9 841.3	
• • • • • •		L24.5	354.7	847.2	
		_			
760 Torr = $1 \text{ atm}$	= 1.013 x 10	) <sup>5</sup> Pa			
			y coefficient	S	
	Redlicn-Kiste	er equations	given below		
T/K	A	В	С		
233.15	1.728	-0.078	0.191		
243.15	1.630	-0.036	0.174		
253.15	1.535	+0.001	0.148		
263.15	1.434	+0.017	0.109		
273.15	1.332	+0.037	0.087	-	
283.15	1.237	+0.048	0.066		
293.15	1.145	+0.061	0.063		
$\ln f_1 = A x_2^2 -$	$P_{m}^{2}(1 - 4)$	m) + C m	$2_{1}$	$12 - \frac{2}{3}$	
	-			~	
$\ln f_2 = A x_1^2 +$	$B x_1^2 (1 - 4)$	$(x_2) + C x_3$	$1^{2}(1 - 8x_{2} +$	$12 x_2^2$ )	
where $f_1 = activit$	y coefficien	t of ethana	mine -d <sub>2</sub>		
	y coefficien		2		
-			in the liquid	d phase	
			liquid phase		
2					

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COMPONENTS:				ORIG	INAL MEAS	UREMENTS:		
l. N-Methyl-methanamine-d; C <sub>2</sub> H <sub>6</sub> DN;				Wo	lff, H.	; Würtz, 1	R.	
[917-72-6]				J. Phys. Chem.				
2. Hexane; C <sub>6</sub> H <sub>14</sub>	; [110-	54-3]		<u>19</u>	<u>70</u> , 74,	1600-1600	5.	
VARIABLES:			[	PREP.	ARED BY:			
Composition	n, temp	erature				P. G. T.	Fogg	
EXPERIMENTAL VALUES:			I					
Variation temperature a	of the and of n	total v mole fra	apor pi ction o	ress of C	ure/Tor: 2 <sup>H</sup> 6 <sup>DN in</sup>	r with van n the liqu	riation of uid phase,	e <sup>x</sup> c <sub>2</sub> H <sub>6</sub> DN
				т/				
<sup>x</sup> C <sub>2</sub> H <sub>6</sub> DN 223.15	233.15	243.15	253.1	5	263.15	273.15	283.15	293.15
0 2.2	3.8	7.7	14.3			45.5		121.1
0 2.2 0.0048 2.5 0.0075 3.0	5.0 5.7	9.4 10.8	17.3 19.7		33.8	52.4 56.6	85.2 91.0	133.4 141.3
0.0207 4.9	9.0	15 2	27 0		15 2	74 1	114.8	173.2
0.0254 5.6	10.0	18.0	30.5		50.4	79.9	122.7	183.6
0.0484 8.2 0.0705 10.2	15.2	13.3 18.0 26.6 33.3 39.1	44.3		70.6	108.9 133.6	163.2 198.3	238.6 286.4
0.0705 10.2 0.0922 11.8	18.9 22.5	33.3 39.1	64.7		102.3	156.3	231.1	331.8
	28.9	51.7	86.6		137.5	209.8	307.9	437.8
0.2535 18.3	28.9 35.7 37.7	51.7 64.9			137.5 178.2	276.6	409.5	584.6
0.0000 10.1		09.0	119.8		194.5 209.5	301.9	448.8 484.9	642.3
	40.1 41.8	73.9 78.2	128.3 135.5		209.5	327.1	484.9 527.6	706.3 765.1
0.4494 21.5	43.2	80.2	140.4		223.0 231.1	350.7 364.3	549.6	798.5
0.5077 22.2	44.6	83.6	147.1		243.4 262.1		582.0 635.5	
0.6055 23.1	47.3	88.8	157.3		262.1	417.3	635.5	932.2
	48.4 49.7	91.6	162.0		268.6 279.5	432.l 447.4	659.8 685.0	
0.7038 24.6 0.7538 25.0	49.7 50.9	94.0	172.2		288.2	447.4		1009.4 1046.4
0	5015						Cont.	
		AUX	(ILIARY	INFOR	MATION			
METHOD / APPARATUS / PROC	EDURE:			SOUR	CE AND PU	RITY OF MAT	ERIALS:	
Apparatus describ	ed prev	iously w	vas	1.	Prepare	d from di	methylamm	onium
used (1). Liquid				chloride; repeatedly fractionated until first and last fractions				
accurately known introduced into a								
thermostat contro					Torr.	or pressu	res withi	n 0.2
The total vapor p					1011.			
by a mercury mano				2.		h grade (		
						um Co., B	artlesvil	le,
The authors calcu coefficients of e					Oklahom	ia).		
the vapor pressur								
described by Bark	er (2).	Consta	ants	1200-	MATTER PE-			
for Redlich-Kiste				LOTI	MATED ERF			
activity coeffici and reported.	ents we	re evalu	lated	δт/	'K = ± 0	.02 (esti	mated by	authors)
				BLEE	RENCES :		- <u></u>	- <u></u>
						u . u#~#-	or 7 7	F1 ~1+~~
				1 * •		H.; Höpfn 962, 66,		Blektro-
				2.		J.A. Aus		m. <u>195</u> 3
					6, 207.			
				з.		, 0.; Kis		Ind. Eng
					$chem.$ $\perp$	948, 21,	343.	
				I				

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COMPONENTS:		ORIGINAL MEASUREMENTS:	
[917-7	-methanamine-d; C <sub>2</sub> H <sub>6</sub> DN; 2-6] C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	Wolff, H.; Würtz, J. Phys. Chem. <u>1970</u> , 74, 1600-16	
VARIABLES:	<u> </u>	PREPARED BY:	
Compo	sition, temperature	P. G. 1	F. Fogg
EXPERIMENTAL V	ALUES: Cont.		
		T/K	
<sup>x</sup> C <sub>2</sub> H <sub>6</sub> DN 223	.15 233.15 243.15 253.1	5 263.15 273.15	5 283.15 293.15
0.9021 27	.6 54.2 102.4 182.6	307.2 493.1 316.8 509.3	759.0 1125.1
	0 Torr = 1 atm = 1.013 x 1 stants for calculation of Redlich-Kister equ T/K A 223.15 1.482 233.15 1.431 243.15 1.326 253.15 1.225 263.15 1.113 273.15 1.021 283.15 0.920 293.15 0.828		C 0.119 0.139 0.111 0.090 0.066 0.066 0.068 0.061
In $f_1$	$= A x_2^2 - B x_2^2 (1 - 4)$	$x_1$ ) + C $x_2^2$ (1 - 8	$x_1 + 12 x_1^2$
$\ln f_2$	= $A x_1^2 + B x_1^2 (1 - 4)$	$x_2$ ) + C $x_1^2$ (1 - 8	$x_2 + 12 x_2^2$ )
where	$f_1$ = activity coefficien $f_2$ = activity coefficien $x_1$ = mole fraction of th $x_2$ = mole fraction of he	t of the amine t of hexane e amine in the liqu xane in the liquid	uid phase phase

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COMPONENTS:		<u> </u>	ORIGINAL MEAS	UREMENTS:		
1. N-(methyl-d <sub>3</sub> )-meth C <sub>2</sub> HD <sub>6</sub> N; [14802-3	ne;	Wolff, H. J. Phys. (		R.		
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [1]	LO-54-3]		<u>1970</u> , 74,	1600-160	6.	
VARIABLES:			PREPARED BY:			
Composition, te	emperature			P. G. T.	Fogg	8
EXPERIMENTAL VALUES:						
Variation of th temperature and of r	ne total va nole fracti	por pr on of	essure/Torr C2 <sup>HD</sup> 6 <sup>N</sup> in th T/K	with var: ne liquid	iation of phase, ¤ <sub>(</sub>	C2 <sup>HD</sup> 6 <sup>N</sup>
<sup>x</sup> C <sub>2</sub> HD <sub>6</sub> N 223.15 233.2	L5 243.15	253.1		273.15	283.15	293.15
0       2.2       3.8         0.0103       3.5       6.7         0.0254       5.8       10.5         0.0509       8.9       16.4         0.0763       11.5       20.5         0.1016       13.6       25.1         0.1504       16.2       30.6         0.2525       20.1       38.8         0.2685       20.3       39.8         0.2685       20.3       39.8         0.2685       20.3       39.8         0.2685       20.3       39.8         0.2778       20.8       40.2         0.3539       22.6       44.1         0.4063       23.4       46.3         0.4258       23.7       46.8         0.5014       24.8       49.5         0.5529       25.4       50.9         0.6053       26.9       52.3         0.6531       27.0       53.5         0.7044       28.5       55.3	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	21.6 31.4 46.4 59.8 71.7 90.3 118.8 122.0 123.8 138.5 146.0 149.5 167.3 172.2	36.7 51.2 73.9 94.4 112.3 141.8 190.2 195.3 198.7 223.8 237.7 243.9 260.9 272.1 283.4 292.8	347.3 370.4 380.2 409.4 428.2 447.9	124.7 169.9 212.1 250.9 312.9 428.5 441.2 449.7 516.1 553.2 569.3 615.2 646.3 677.9	304.1 357.6 442.5 609.1 626.0 638.5 739.9 795.8 819.9 891.3 938.3 987.1
	AU	XILIARY	INFORMATION			
METHOD/APPARATUS/PROCEDURE	:		SOURCE AND PU	RITY OF MAT	ERIALS:	
METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressure was measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations for activity coefficients were evaluated and reported.			fraction fraction pressure 2. Research	<pre>ht; purif ation unt s differe s by less grade (P m Co., Ba .) OR:</pre>	ieá bý re il first d in vapc than 0.2 hillips rtlesvill	peated and last Torr. e,
			<ol> <li>Barker, 6, 207.</li> <li>Redlich,</li> </ol>	<u>62</u> , 66, 1 J.A. Aust	49. . J. Chem er, A.T.	. <u>1953</u> ,

Solubilities of Deuterated Amines

COMPONENTS:       ORIGINAL MEASUREMENTS:         1. N-(methy1-d <sub>3</sub> )-methan-d <sub>3</sub> -amine; C <sub>2</sub> HD <sub>6</sub> N; [14802-36-9]       Wolff, H.; Würtz, R. J. Phys. Chem.         2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]       1970, 74, 1600-1606.	
0 14	
VARIABLES: PREPARED BY:	
Composition, temperature P. G. T. Fogg	
EXPERIMENTAL VALUES: Cont.	
T/K	
<sup>x</sup> C <sub>2</sub> HD <sub>6</sub> N 223.15 233.15 243.15 253.15 263.15 273.15 283.15 29	3.15
	14.5
	56.3
0.9218 31.2 63.0 118.4 209.2 349.8 558.7 855.0 12	62.2
1 32.8 66.0 124.8 221.1 369.8 591.5 906.6 13	39.4
Redlich-Kister equations given below T/K A B C	
223.15       1.452       -0.029       0.168         233.15       1.396       -0.010       0.121	
233.15 1.396 -0.010 0.121 243.15 1.287 +0.014 0.086	
253.15 1.189 +0.033 0.076	
263.15 1.078 +0.047 0.056	
273.15 0.984 +0.054 0.054	
283.15 0.888 +0.061 0.049	
283.15         0.888         +0.061         0.049           293.15         0.792         +0.063         0.049	
$\ln f_{1} = A x_{2}^{2} - B x_{2}^{2} (1 - 4 x_{1}) + C x_{2}^{2} (1 - 8 x_{1} + 12 x_{1}^{2})$	
283.15         0.888         +0.061         0.049           293.15         0.792         +0.063         0.049	
$\frac{283.15}{293.15} = 0.888 + 0.061 + 0.049 + 0.063 = 0.049$ $\lim_{t \to 1} f_1 = A x_2^2 - B x_2^2 (1 - 4 x_1) + C x_2^2 (1 - 8 x_1 + 12 x_1^2)$ $\lim_{t \to 2} f_2 = A x_1^2 + B x_1^2 (1 - 4 x_2) + C x_1^2 (1 - 8 x_2 + 12 x_2^2)$ where $f_1$ = activity coefficient of the amine	
$\begin{array}{rcrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	
$\frac{283.15}{293.15} = 0.888 + 0.061 + 0.049 + 0.063 + 0.049 + 0.049 + 0.063 + 0.049 + 0.063 + 0.049 + 0.049 + 0.063 + 0.049 + 0.049 + 0.063 + 0.049 + 0.049 + 0.063 + 0.049 + 0.040 + $	
$\begin{array}{rcrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	
$\frac{283.15}{293.15} = 0.888 + 0.061 + 0.049 + 0.063 + 0.049 + 0.049 + 0.049 + 0.063 + 0.049 + 0.040 + $	

<pre>1. N-(methyl-d<sub>2</sub>) C<sub>2</sub>D<sub>7</sub>N; [220 2. Hexane; C<sub>6</sub>H<sub>1</sub> VARIABLES: Composition The second second</pre>	4; [110- on, temp	54-3]		Wolff, H.; J. Phys. ( <u>1970</u> , 74, PREPARED BY:	Chem.		
Compositio		erature		PREPARED BY:			
		erature					
BURBERT GURBET HALVES					Р. G. Т.	Fogg	
EXPERIMENTAL VALUES:	e			<u></u>			
Variation temperature an	of the nd of mo	total va le fract	por pre ion of	essure/Torr C <sub>2</sub> D <sub>7</sub> N in th	with var: ne liquid	iation of phase, x <sub>(</sub>	C₂D <sub>7</sub> N
				т/к			2 /
<sup>x</sup> C <sub>2</sub> D <sub>7</sub> N 223.15	233.15	243.15	253.15	5 263.15	273.15	283.15	293.15
$ \begin{array}{cccccc} 0.0761 & 11.6 \\ 0.1012 & 13.0 \\ 0.1516 & 15.9 \\ 0.2028 & 18.4 \\ 0.2538 & 19.8 \\ 0.3003 & 20.1 \\ 0.3512 & 21.4 \\ 0.4005 & 22.2 \\ 0.4504 & 22.9 \\ 0.5019 & 23.2 \\ 0.5485 & 24.1 \\ 0.6022 & 25.1 \\ 0.6533 & 25.5 \\ \end{array} $	6.5 10.4 16.1 24.4 34.9 37.9 37.9 39.9 42.2 43.8 45.7 47.2 48.5 50.0	18.7 28.0 36.2 42.9 53.9 62.3 68.7 73.2 77.8 81.7 84.8 88.1 91.1 93.9 96.8	21.6 31.8 46.6 60.0 71.4 90.3 104.7 117.0 125.6 133.7 141.9 148.1 153.8 159.8 165.5	36.9 51.9 73.9 94.6 112.5 142.9 166.7 187.6 203.4 218.0 232.0 242.9 253.3 264.6 274.3	82.1 114.1 144.3 171.3 218.0 254.9 288.6 314.5 339.6 363.0 381.6 398.9 418.1 435.5	125.7 170.5 212.7 251.8 320.3 374.0 426.0 466.8 506.8 506.8 544.4 572.8 602.3 633.7 661.0	924.4 966.9
		AUX	KILIARY I	NFORMATION		_	
METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressure was measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported.				<pre>SOURCE AND PURITY OF MATERIALS: 1. (CD<sub>3</sub>)<sub>2</sub>NH<sub>2</sub>Cl (Merck, Darmstadt) was used to prepare (CD<sub>3</sub>)<sub>2</sub>NH which was then converted to (CD<sub>3</sub>)<sub>2</sub>ND by the action of D<sub>2</sub>O. Purification was by repeated fractionation until first and last fractions had vapor pressures within 0.2 Torr (1), (4). 2. Research grade (Phillips Petroleum Co., Bartlesville, Oklahoma.) ESTIMATED ERROR: <math>\delta T/K = \pm 0.02</math> (estimated by authors) REFERENCES: 1. Wolff, H.; Höpfner, A. Z. Elektro- chem. <u>1962</u>, 66, 149. 2. Barker, J.A. Aust. J. Chem. <u>1953</u>, 6, 207. 3. Redlich, O.; Kister, A.T. Ind. Eng Chem. <u>1948</u>, 21, 345.</pre>			

COMPONENTS:	- <u></u>			OR	IGINAL MEAS	UREMENTS:		
1. N-(met)	<pre>1. N-(methyl-d<sub>3</sub>)-methan-d<sub>3</sub>-amine-d; C<sub>2</sub>D<sub>7</sub>N; [22024-52-8]</pre>					; Würtz, 1	R.	
$C_2 D_7 N; [22024-52-8]$					J. Phys. (	Chem.		
2. Hexane	: C.H.	.: [110-	54-31		1970, 74,	1600~160	5.	
21 nenune	, 6.1	4, (220	,			2000 2000		
VARIABLES:				PR	EPARED BY:			- <u> </u>
Com	positi	on, temp	erature			Р. G. T.	Fogg	
EXPERIMENTAL	VALUES	: Cont	•	<u> </u>				
				Т	/K			
<sup>x</sup> C <sub>2</sub> D <sub>7</sub> N 22	23.15	233.15	243.15	253.15	263.15	273.15	283.15	293.15
0.7533	26.8	54.3	102.5	181.7	303.6	484.9	741.7	1092.5
	27.4	55.6	105.5	186.7	312.5	499.7	766.3	1130.4
		57.6			323.2	517.9	795.7	1175.8
	29.4	59.3	112.0	199.0	333.4	535.5	823.0	1219.0
1	30.8	62.4	119.0	212.3	356.5	572.9	882.1	1309.7
	760 To	rr = 1 a	tm = 1.0	13 x 10 <sup>5</sup>	Pa			
(	Consta	nts for the Red	calculat lich-Kis	ion of a ter equa	ctivity co tions give	Defficient en below	ts from	
		T/K	А	•	в		2	
		23.15	1.4	<u> </u>	-0.078	0.1		
		33.15	1.4		-0.016		L37 L51	
		43.15	1.3		+0.006	0.1		
		53.15	1.2		+0.021		097	
		63.15		17	+0.038	0.0	77	
		73.15	1.0		+0.045	0.0		
		83.15 93.15	0.9 0.8		+0.050 +0.046	0.0		
	<u></u>							
					+ $C x_{2}^{2}$			
ln f <sub>2</sub>	= A	x1 +	B x 1 <sup>2</sup> (1	- 4 <sup>x</sup> 2)	+ $c x_{1}^{2}$	$(1 - 8 x_2)$	$2 + 12 x_2^2$	·)
where	f <sub>1</sub> =	activi	ty coeff	icient of	E the amir	le		
	$f_{2}^{-} =$	activi	ty coeff	icient of	E hexane			
	4				nine in th	e liquid	nhase	
	-	mole f	raction	of hexane	e in the 1	liquid pha	ise	
	<i>x</i> 2 =	MOTE L	Luction	02				
						·		
					<u> </u>		<u> </u>	

COMPONENTS :	<u> </u>		ORIGINAL MEASURE	MENTS:		
<ol> <li>Methanamine-d<sub>2</sub>; CH<sub>3</sub>D<sub>2</sub>N; [2614-35-9]</li> <li>N,N-Dimethylmethanamine,</li> </ol>			Wolff, H; Würtz, R. Z. Phys. Chem. (Frankfurt am Main) 1969, 67, 115-121			
(trim [75-5	ethylamine);	C <sub>3</sub> H <sub>9</sub> N;	<u>1303</u> , 0, , 11	5 121		
VARIABLES:			PREPARED BY:	· · · · · · · · · · · · · · · · · · ·	<u> </u>	
Comp	osition, temp	erature	P.	G. T. Fogg		
EXPERIMENTAL	VALUES:					
Vari temperatu	ation of the re and of mol	total vapor p e fraction of	ressure/Torr wi CH <sub>3</sub> D <sub>2</sub> N in the	th variation o liquid phase,	of <sup>x</sup> CH <sub>3</sub> D <sub>2</sub> N	
			т/к		J 2 ,	
<sup><i>x</i></sup> CH <sub>3</sub> D <sub>2</sub> N	223.15	233.15	253.15	273.15	293.15	
0	56.4	102.3	288.3	676.9	1387.0	
0.0105	57.8	105.0	293.2	687.1	1411.9	
0.0301 0.0505	59.7 60.4	107.8 109.6	302.0 310.6	708.1 727.6	1454.3 1495.2	
0.0689	61.8	111.7	316.7	744.3	1530.6	
0.0901	63.0	115.3	327.1	769.7	1582.1	
0.0994	63.3	115.5	327.0	770.9	1589.0	
0.1502	65.0	119.2	341.0	807.3	1665.7	
0.1973	66.7	122.8	352.7	838.8	1737.0	
0.2475	68.0	125.2	362.6	864.6	1798.3	
0.2981 0.3664	68.7 69.5	127.3 129.3	371.3	892.2 920.4	1862.5 1928.1	
0.4076	69.8	130.3	379.1 383.8	931.9	1960.1	
0.4481	69.5	130.9	388.2	944.1	1991.0	
0.4980	70.0	131.9	391.5	956.8	2029.8	
0.5401	70.4	132.4	394.6	968.7	2053.0	
0.6020	69.3	131.5	396.5	976.9	2084.1	
0.6446	69.5	131.5	398.1	983.0	2107.0	
		<u></u>	<u> </u>	• Cor	····	
		AUXILIARY	INFORMATION			
METHOD /APPARA	TUS/PROCEDURE:		SOURCE AND PURIT			
Apparatus	locaribod news			rom CH3NH2 and		
	lescribed prev Liquid mixtu		repeatedly fractionated until the first and last fractions had vapor pressures which differed by less			
accurately	known composit	ition were				
introduced into a cell held in a			than 0.5 torr at $20^{\circ}C$ (4).			
thermostat controlled to ± 0.02°C.						
The total vapor pressure was measured by a mercury manometer.			2. Prepared from trimethylammonium hydrochloride and purified as 1			
The suthers	a a laulatod		(5).			
coefficient	s calculated a s of each con	nponent by a				
Constants f	ribed by Bark or Redlich-Ki	ter (2).				
	(3) for activi		<b>ESTIMATED ERROR:</b>			
coefficient	s were evalua	ited and		02 100+3	he and he	
reported.				.02 (estimated	by author	
			REFERENCES: 1. Wolff, H.; chem 1962	Höpfner, A. Z	. Elektro	
				, 66, 149. A. Aust. J. Ch	em. <u>1953</u> ,	
			6, 207. 3. Redlich, O	.; Kister, A.T	. Ind. End	
			Chem. 1948			
			4. Wolff, H.;	Höpfner, A. B		
			Bunsenges.	Phys. Chem. 1	<u>965</u> , 69,7:	
			5. Wolff, H.;	Whrte D Dam	Bungan	

		Solubilities of D	euterated Amines		25
COMPONENTS :	<u></u>		ORIGINAL MEASURE	MENTS:	
1 Mathema	mineral · CU D	М.	Wolff H. W		
	mine-d <sub>2</sub> ; CH <sub>3</sub> D <sub>2</sub>	N ;	Wolff, H; Würtz, R.		
[2614-35-9]			Z. Phys. Che	em. (Frankfurt	am Main)
	ethylmethanami	<b>n</b> 0	<u>1969</u> , 67, 11	15-121.	
	ethylamine); C				
[ 75-5	0-3]	3.9.17			
VARIABLES:			PREPARED BY:		·····
			I KLIAKED BI		
Comp	osition, tempe	rature	Р.	G. T. Fogg	
EXPERIMENTAL	VALUES: Cont.		I т/к	<u></u>	<u></u>
<b>2</b> *			•		
<sup>x</sup> CH <sub>3</sub> D <sub>2</sub> N	223.15	233.15	253.15	273.15	293.15
0.7466	68.7	129.6	396.7	989.2	2137.6
0.8485	66.1	126.3	390.5	984.9	2145.6
0.8965	64.3	123.7	385.5	978.8	2143.5
0.9487	61.7	120.3	378.4	966.0	2128.3
1	59.1	115.6	367.4	947.8	2105.4
	T/K 223.15 233.15 243.15 253.15 263.15	A 0.767 0.749 0.719 0.692 0.659	B -0.075 -0.059 -0.013 0.000 +0.019	C 0.139 0.071 0.036 0.052 0.056	
	273.15	0.621	+0.028	0.028	
	283.15 293.15	0.578 0.539	+0.038 +0.031	0.037 0.040	
ln $f_1$	$=$ A $x_2^2$ -	$B x_2^2 (1 - 4 x)$	$(1) + C x_2^{-2}$	$-8 x_1 + 12 x_1$	1 <sup>2</sup> )
				$-8x_2 + 12x$	
<sup>111</sup> <sup>J</sup> 2		D -1 (1 - 4 -	2, 0, 0, 1, 12		2 ′
where $f$	] = activity c	oefficient of	methanamine-d	<sup>1</sup> 2	
f	$_{2}$ = activity c	oefficient of	trimethylamin	e	
x	$r_1 = mole fract$	ion of methan	amine-d <sub>2</sub>		
	_ _ = mole fract		-		
	2				

COMPONENTS:	EVALUATOR:
l. Other amines. 2. Organic liquids.	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London N7 8DB, United Kingdom. August 1983

CRITICAL EVALUATION:

The measurements by Wolff *et al.* (1-6) of the vapor pressure of various systems containing ethanamine, propanamine or deuterated amines are of high standard and may be accepted as reliable.

The solubility of propanamine in several alcohols was measured by Copley *et al.* (7) at 305.4 K and a pressure of propanamine of 106 mmHg, said to be its vapor pressure at 277.7 K. This value of the vapor pressure may be compared with the interpolated value of 119 mmHg from measurements by Wolff which are likely to be the more accurate. However, values published by Copley *et al.* are of the magnitude expected for solubilities in hydroxy-compounds, by analogy with the behaviour of other amines. The possibility of error in the reported pressure should be borne in mind.

Copley *et al.* also reported solubilities of 2-propanamine, 2-methyl-l-propanamine, 1-butanamine and 2-butanamine. These are of the expected order of magnitude for the solvents investigated and should be accepted on a tentative basis until comparisons with other measurements of solubilities of these amines can be made.

References:

- Wolff, H.; Höpfner, A.; Höpfner, H.-M. Ber. Bunsenges. Phys. Chem. <u>1964</u>, 68, 410.
- Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1965</u>, 69, 710.
- Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1967</u>, 71, 461.
- Wolff, H.; Würtz, R.
   *2. Phys. Chem (Frankfurt am Main)* <u>1969</u>, 67, 115.
- Wolff, H.; Würtz, R. J. Phys. Chem. <u>1970</u>, 74, 1600.
- Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria <u>1983</u>, 11, 267-287.
- Copley, M. J.; Ginsberg, E.; Zellhoefer, G. F.; Marvel, C. S. J. Amer. Chem. Soc. <u>1941</u>, 63, 254.

COMPONENTS:			ORIGINAL MEASU	REMENTS:					
1	namine, (ethyla 5-04-7]	umine); C <sub>2</sub> H <sub>7</sub> N;	Wolff, H.; Höpfner, A.; Höpfner,HM. Ber. Bunsenges. Phys. Chem.						
2. Butan	ne; C <sub>4</sub> H <sub>10</sub> ; [106	-97-8]	<u>1964</u> , 68,	410-417.					
VARIABLES:		<u> </u>	PREPARED BY:						
	mposition, temp	perature		P. G. T. Fogg					
EXPERIMENTA	EXPERIMENTAL VALUES:								
Va temper	Variation of the total vapor pressure/Torr with variation of temperature and of mole fraction of $C_2^{\rm H} _7^{\rm N}$ in the liquid phase, ${}^xC_2^{\rm H} _7^{\rm N}$								
			т/к						
<sup><i>x</i></sup> с <sub>2</sub> н <sub>7</sub> <sup>N</sup>	218.15	233.15	253.15	273.15	293.15				
0 0.0141 0.0353 0.0544	52.1 53.1 53.7 54.2	125.0 127.0 129.2 130.8	338.5 343.3 349.2 352.9	772.7 782.6 794.1 802.9	1552.6 1571.1 1594.2				
0.0887 0.1265 0.1446	54.5 54.3 54.6	131.7 132.1 132.3	357.5 360.0 360.7	814.7 821.6 824.1	1612.2 1635.8 1655.4 1660.7				
0.168 0.195 0.281 0.348	54.3 54.2 53.9 53.1	132.1 132.1 130.5 129.3	360.3 360.0 358.3 354.3	826.5 827.7 824.4 818.5	1667.4 1670.5 1672.4 1663.1				
0.359 0.400 0.423	54.0 52.9 52.3	129.5 128.0 127.4	353.5 350.5 348.0 332.5	816.4 809.9 806.2	1659.6 1649.9 1642.9				
0.575 0.577 0.646 0.651	50.1 50.1 48.3 48.6	121.4 121.5 116.8 116.6	331.7 320.3 319.8	770.5 768.4 743.7 743.5	1575.5 1571.6 1524.6 1522.7				
				Cont.					
		AUXILIARY	INFORMATION						
METHOD/APPARATUS/PROCEDURE: Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressures were measured by a mercury manometer. The authors calculated activity coefficients of each component from the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for activity coefficients were evaluated and reported.			<pre>SOURCE AND PURITY OF MATERIALS: 1. From commercial reinst ethyl- ammonium chloride by reaction with KOH; gas dried with KOH and Na; liquified gas treated with Li and repeatedly fractionated until the first and last fractions had consistent vapor pressures as described for methylamine (1). 2. Commercial product; dried with P_O, repeatedly fractionated until first and last fractions had consistent vapor pressures as described for <u>hexane (1).</u> ESTIMATED ERROR: δT/K = ± 0.02 (estimated by authors) REFERENCES: 1. Wolff, H.; Höpfner, A. Z. Elektro- chem. 1962, 66, 149. 2. Barker, J.A. Aust. J. Chem. 1953, 6, 207.</pre>						
				O.; Kister, A. 48, 21, 345.	T. Ind. Eng.				

;

204		Solubilities of			
COMPONENTS :			ORIGINAL MEASURE	EMENTS:	
<pre>1. Ethanamine, (ethylamine); C<sub>2</sub>H<sub>7</sub>N; [75-04-7] 2. Butane; C<sub>4</sub>H<sub>10</sub>; [106-97-8]</pre>			Wolff, H.; Höpfner, A.; Höpfner,HM. Ber. Bunsenges. Phys. Chem. <u>1964</u> , 68, 410-417.		
VARIABLES:			PREPARED BY:		
Comp	position, tempe	erature	Р	. G. T. Fogg	
EXPERIMENTAL	VALUES: Cont.	•	A		
			T/K		
<sup><i>x</i></sup> C <sub>2</sub> H <sub>7</sub> N	218.15	233.15	253.15	273.15	293.15
0.772 0.838 0.861 0.900 0.935 0.940 0.962 1	43.2 38.6 36.4 32.4 26.7 25.8 21.8 12.1	104.6 94.0 89.2 79.8 67.3 66.3 56.5 37.3	288.3 262.7 250.5 227.8 199.0 197.0 174.7 131.6	675.5 622.1 598.5 553.1 496.2 492.7 450.1 369.2	1396.9 1300.9 1259.2 1178.0 1082.1 1076.6 1006.7 872.9
	Constants fo		n of activity equations gi		
	T/K	А	В	С	
	218.15 223.15 228.15 233.15 243.15 253.15 263.15 273.15 283.15 293.15	1.772 1.718 1.671 1.630 1.528 1.439 1.348 1.259 1.176 1.091	-0.212 -0.201 -0.179 -0.173 -0.128 -0.100 -0.070 -0.041 -0.024 -0.011	0.237 0.213 0.205 0.184 0.142 0.123 0.098 0.072 0.062 0.048	
	_ 2			$(1 - 8 x_1 + 12)$ $(1 - 8 x_2 + 12)$	
where	$f_{2} = A x_{1} + f_{1} = active f_{2} = active x_{1} = mole + f_{2} = mole + f_{2}$	ity coefficier ity coefficier fraction of et fraction of bu	nt of ethylamin at of butane chylamine in t atane in the l	ne he liquid phas iquid phase	e

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	30	ublittles of		163	255		
COMPONENTS:			ORIGINAL M	EASUREMENTS :			
<pre>1. Ethanamine, (ethylamine); C2H7N; [75-04-7] 2. Hexane; C6H14; [110-54-3]</pre>			Wolff, H.; Höpfner, A.; Höpfner,HM Ber. Bunsenges. Phys. Chem. <u>1964</u> , 68, 410-417.				
VARIABLES:		<u></u>	PREPARED B	٧.			
	ition, temperatu	ire		P. G. T. Fogg	:		
EXPERIMENTAL VAL	.UES:						
Variation of the total vapor pressure/Torr with variation of temperature and of mole fraction of $C_2^{H}7^{N}$ in the liquid phase, $x_{C_2^{H}7^{N}}$							
			T/	Ϋ́K			
<sup>ж</sup> с <sub>2</sub> н <sub>7</sub> <sup>N</sup>	233.15	253	.15	273.15	293.15		
0 0.0105 0.0266 0.0359 0.0598 0.0824 0.0921 0.0956 0.1244 0.1591 0.1744 0.227 0.319 0.400 0.436 0.441 0.558 0.622 0.631	3.7 6.3 9.7 11.5 15.0 17.6 18.7 19.2 21.5 23.5 23.6 25.7 28.2 28.9 29.9 29.9 29.9 31.6 33.0 32.2	14 20 29 34 43 52 56 56 64 72 75 83 93 100 102 102 109 111	.4 .6 .0 .0 .4 .8 .7 .7 .7 .4 .4 .3 .1 .4 .2 .0 .3	45.4 59.1 77.8 88.3 110.9 130.5 140.1 141.4 162.4 184.4 191.8 215.7 247.2 268.1 276.4 276.8 298.5 307.7 309.4	121.0 145.5 180.3 201.1 244.6 287.1 304.9 306.5 350.7 401.8 417.5 473.3 552.8 607.2 629.2 632.0 689.1 716.2 722.0 Cont.		
		AUXILIARY	INFORMATIO	N			
used (1). Li accurately kr introduced in thermostat co The total vap by a mercury The authors of coefficients the vapor pro- described by for Redlich-H	scribed previous iquid mixtures o nown composition nto a cell held ontrolled to ± 0 por pressure was manometer. calculated activ of each compone essure data by a Barker (2). Co (ister equations Efficients were e	ly was f were in a .02°C. measured ity nt from method nstants (3) for	SOURCE ANI 1. From ethyl with Na; 1 and r descr methy 2. Mater over fract f	D PURITY OF MATERIALS commercial reinst ammonium chloride KOH; gas dried wi iquified gas trea epeatedly fractio ibed for preparat lamine (1). ial of high purit P205, distilled an ionated until fir ions had the same ures as measured eter.(1). ERROR: 0.02 (estimated S: , H.; Höpfner, A. <u>1962, 66, 149.</u> r, J.A. Aust. J.	by reaction th KOH and ted with Li onated as tion of by; dried dd repeatedly st and last vapor by the by authors) <i>Z. Elektro-</i> <i>Chem.</i> <u>1953</u> ,		

200		Solubilities of O	uner Amines		
COMPONENTS :	······	0	RIGINAL MEASURE	EMENTS:	<u></u>
[75-)	mine, (ethylamin 04-7] ; C <sub>6</sub> H <sub>14</sub> ; [110-54	- /		Höpfner, A.; Hö ges. Phys. Chem 10-417.	
VARIABLES:		P	REPARED BY:	···	
Com	position, temper	ature	P	. G. T. Fogg	
	·				
EXPERIMENTAL	VALUES: Cont.				
			T/K		
<sup><i>x</i></sup> С <sub>2</sub> н <sub>7</sub> <sup>N</sup>	233.15	253.	15	273.15	293.15
<u></u>			+		
0.687 0.761	32.8 35.1	115.		318.8 330.5	744.2 774.3
0.831 0.846	35.0 35.4	122. 123.		341.4 344.1	801.9 808.1
0.928	35.6	127.			843.0 851.5
1	37.6	132.		369.5	872.8
	Constants for from the Red T/K	lich-Kister e A	quations give B	en below C	
	233.15	1.665	-0.082	0.232	
	243.15	1.581	-0.015	0.169	
	253.15 263.15	1.477 1.376	-0.004 +0.024	0.107 0.096	
	273.15 283.15	1.285 1.190	+0.046 +0.061	0.081 0.067	
	293.15	1.097	+0.077	0.061	
ln $f_1$	$=$ A $x_2^2$ - B	$x_2^2(1 - 4 x_1)$	) + $C x_2^2$ (2)	$1 - 8 x_1 + 12 x_1$	1 <sup>2</sup> )
$\ln f_{2}$	$= A x_1^2 + B$	$x_1^2(1 - 4 x_2)$	$+ c_{x}^{2}$	$1 - 8 x_{0} + 12 x_{0}$	2 <sup>2</sup> )
- 2	T	1 2	T	2	2
where	$f_1 = \text{activity}$			9	
	$f_2 = \text{activity}$ $x_1 = \text{mole fraction}$			e liquid phase	
	<u>+</u>	ction of hexa			
	2			-	

					257
COMPONENTS:			ORIGINAL MEASUREM	ENTS:	
<pre>1. Ethanamine-d<sub>2</sub>; C<sub>2</sub>H<sub>5</sub>D<sub>2</sub>N;</pre>			Wolff, H.; H	öpfner, A.	
[5852-4				es. Phys. Cher	n.
	-		1965, 69, 71	-	
2. Butane; C	4 <sup>H</sup> 10; [106-97·	-8]	,,		
VARIABLES:			PREPARED BY:		
Compos:	ition, Tempera	ature	Р.	G. T. Fogg	
EXPERIMENTAL VALU					
Variat: temperature a	ion of the tot and of mole f	tal vapor pr raction of C	essure/Torr wi $2^{H}5^{D}2^{N}$ in the	th variation o liquid phase,	of <sup>x</sup> C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> N
			T/K		
	210 15	222 15	252 15	222 15	202.15
<sup>x</sup> C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> N	218.15	233.15	253.15	273.15	293.15
			•		
0 0102	52.1	125.0	338.5	772.7	1552.6
0.0102 0.0242	52.9 53.6	126.5 128.4	341.7 346.0	780.0 788.8	1566.5 1583.5
0.0463	53.7	130.1	351.0	800.5	1606.6
0.0646	54.1		354.9	808.0	1621.4
0.0925	54.7	131.2	357.6	816.9	1640.5
0.146	54.2	131.9	359.9	825.6	1662.0
0.171	54.3	131.8	360.0	827.4	1668.6
0.212	54.0 53.7	131.3 130.6	359.1 358.9	827.2 826.9	1673.6 1674.2
0.268	53.3	130.4	357.1	825.0	1671.8
0.343	53.3	128.9	353.6	816.7	1661.3
0.425	52.0	126.7	347.2	804.2	1638.3
0.483	52.2	125.1	341.7	792.1	1614.9
0.579	49.7 48.6	120.6 116.9	329.9 321.3	765.0 744.9	1565.1 1525.7
0.651	48.0	115.7	317.0	737.6	1512.0
0.677	46.8	113.6	311.6	725.4	1490.6
0.687	46.9	113.5	310.1	721.5	1482.5
					Cont.
		AUXILIARY	INFORMATION		
METHOD APPARATUS	/PROCEDURE:		SOURCE AND PURITY	OF MATERIALS:	
Apparatus described previously was used (1). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ± 0.02°C. The total vapor pressure was measured by a mercury manometer. The authors calculated activity coefficients of each component by a method described by Barker (2). Constants for Redlich-Kister			<ol> <li>Prepared from C<sub>2</sub>H<sub>5</sub>NH<sub>2</sub> and D<sub>2</sub>O; repeatedly fractionated until 1st and last fractions had vapor pressures which differed by 0.4 Torr at 20°C. Spectroscopic measurements indicated that the product was at least 99% pure.</li> <li>Commercial product; dried over P<sub>2</sub>O<sub>5</sub>; distilled and repeatedly fractionated until first and last fractions had consistent vapor pressures, as described for hexane (1)</li> </ol>		
equations for were evaluate	activity coe	fficients	STIMATED ERROR: δτ/κ = ± 0.02	e (estimated b	y authors)
			REFERENCES:		
			1. Wolff, H.;		. Elektro-
1			<i>chem</i> . <u>1962</u> , 2. Barker, J.	A. Aust. J. C	hem. 1953.
			6, 207.		
			3. Redlich, O. Chem. <u>1948</u> ,		. Ind. Eng.

1. Ethanamine-d <sub>2</sub> ; C <sub>2</sub> H <sub>5</sub> D <sub>2</sub> N; [5852-45-9] 2. Butane; C <sub>4</sub> H <sub>10</sub> ; [106-97-8] Wolff, H.; Höpfner, A. Ber. Bunsenges. Phys. Chem. <u>1965</u> , 69, 710-716. EXPERIMENTAL VALUES: Cont.
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
$T/K$ $T_{C_2H_5D_2N} 218.15 233.15 253.15 273.15 293.$ $0.754 43.8 105.7 291.5 681.8 1410 0.803 40.6 99.2 274.5 645.2 1342 0.869 35.3 85.9 242.0 579.4 1222 0.890 32.4 80.5 227.6 551.8 1176 0.930 27.1 67.9 198.9 494.1 1078 0.955 22.5 57.9 175.7 450.5 1003 1 11.3 34.8 124.5 354.7 847 11.3 34.8 124.5 354.7 847 160 Torr = 1 atm = 1.013 x 105 Pa T/K A B C \frac{T/K A B C}{218.15 1.762 - 0.219 0.233 0.253 223.15 1.660 - 0.199 0.210 223.15 1.660 - 0.199 0.210 223.15 1.660 - 0.194 0.206 243.15 1.558 - 0.151 0.150 233.15 1.660 - 0.194 0.206 243.15 1.558 - 0.151 0.150 233.15 1.660 - 0.194 0.206 243.15 1.558 - 0.151 0.150 233.15 1.286 - 0.071 0.083 263.15 1.376 - 0.095 0.106 273.15 1.286 - 0.071 0.083 263.15 1.115 - 0.032 0.049$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
0.803 40.6 99.2 274.5 645.2 1342 0.869 35.3 85.9 242.0 579.4 1222 0.890 32.4 80.5 227.6 551.8 1176 0.930 27.1 67.9 198.9 494.1 1078 0.955 22.5 57.9 175.7 450.5 1003 1 11.3 34.8 124.5 354.7 847 760 Torr = 1 atm = 1.013 x 10 <sup>5</sup> Pa Constants for calculation of activity coefficients from the Redlich-Kister equations given below T/K A B C 218.15 1.762 -0.219 0.233 223.15 1.660 -0.194 0.206 243.15 1.558 -0.151 0.150 233.15 1.660 -0.194 0.206 243.15 1.767 -0.125 0.132 263.15 1.376 -0.095 0.106 273.15 1.286 -0.071 0.083 283.15 1.199 -0.050 0.064 293.15 1.115 -0.032 0.049
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1   11.3   34.8   124.5   354.7   847 760 Torr = 1 atm = 1.013 x 10 <sup>5</sup> Pa Constants for calculation of activity coefficients from the Redlich-Kister equations given below $T/K   A   B   C$ 218.15   1.789   -0.233   0.253 223.15   1.762   -0.219   0.233 228.15   1.699   -0.199   0.210 233.15   1.660   -0.194   0.206 243.15   1.558   -0.151   0.150 253.15   1.470   -0.125   0.132 263.15   1.376   -0.095   0.106 273.15   1.286   -0.071   0.083 283.15   1.115   -0.032   0.049
760 Torr = 1 atm = 1.013 x $10^5$ Pa Constants for calculation of activity coefficients from the Redlich-Kister equations given below T/K A B C 218.15 1.789 -0.233 0.253 223.15 1.762 -0.219 0.233 228.15 1.699 -0.199 0.210 233.15 1.660 -0.194 0.206 243.15 1.558 -0.151 0.150 253.15 1.470 -0.125 0.132 263.15 1.376 -0.095 0.106 273.15 1.286 -0.071 0.083 283.15 1.199 -0.050 0.064 293.15 1.115 -0.032 0.049
Constants for calculation of activity coefficients from the Redlich-Kister equations given below $T/K$ ABC218.151.789-0.2330.253223.151.762-0.2190.233228.151.699-0.1990.210233.151.660-0.1940.206243.151.558-0.1510.150253.151.470-0.1250.132263.151.376-0.0950.106273.151.286-0.0710.083283.151.199-0.0500.049
from the Redlich-Kister equations given below $T/K$ ABC218.151.789-0.2330.253223.151.762-0.2190.233228.151.699-0.1990.210233.151.660-0.1940.206243.151.558-0.1510.150253.151.470-0.1250.132263.151.376-0.0950.106273.151.286-0.0710.083283.151.199-0.0500.064293.151.115-0.0320.049
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$
233.15       1.660       -0.194       0.206         243.15       1.558       -0.151       0.150         253.15       1.470       -0.125       0.132         263.15       1.376       -0.095       0.106         273.15       1.286       -0.071       0.083         283.15       1.199       -0.050       0.064         293.15       1.115       -0.032       0.049
243.15       1.558       -0.151       0.150         253.15       1.470       -0.125       0.132         263.15       1.376       -0.095       0.106         273.15       1.286       -0.071       0.083         283.15       1.199       -0.050       0.064         293.15       1.115       -0.032       0.049
253.15       1,470       -0.125       0.132         263.15       1.376       -0.095       0.106         273.15       1.286       -0.071       0.083         283.15       1.199       -0.050       0.064         293.15       1.115       -0.032       0.049
263.15       1.376       -0.095       0.106         273.15       1.286       -0.071       0.083         283.15       1.199       -0.050       0.064         293.15       1.115       -0.032       0.049
283.15       1.199       -0.050       0.064         293.15       1.115       -0.032       0.049
293.15 1.115 -0.032 0.049
$\ln f_1 = A x_2^2 - B x_2^2 (1 - 4x_1) + C x_2^2 (1 - 8 x_1 + 12 x_2^2)$
$\ln f_2 = A x_1^2 + B x_1^2 (1 - 4x_2) + C x_1^2 (1 - 8 x_2 + 12 x_2^2)$
where $f_1$ = activity coefficient of ethanamine-d <sub>2</sub>
$f_2$ = activity coefficient of butane
$x_1 =$ mole fraction of ethanamine-d <sub>2</sub> in the liquid phase
$x_2$ = mole fraction of butane in the liquid phase

COMPONENTS :			ORIGINAL MEASURE	MENTS .		
		1 amin - )				
-	anamine, (propy	lamine);	1	öpfner, A.; Höpfner, HM.		
<sup>C</sup> 3 <sup>H</sup> 9	N; [107-10-8]			es. Phys. Chem.		
2. Hexane	; C <sub>6</sub> H <sub>14</sub> ; [110-5	4-3]	1964, 68, 410	0-41/.		
VARIABLES:		· · · · · · · · · · · · · · · · · · ·	PREPARED BY:	·····		
	magilian towns	<b>W</b> = <b>t</b>		C III Read		
COM	position, tempe	rature	Ľ.	. G. T. Fogg		
EXPERIMENTAL	VALUES.		L	· · · · · · · · · · · · · · · · · · ·		
		-				
Va temper	riation of the ature and of mo	total vapor p le fraction d	pressure/Torr w of C_H_N in the	with variation of e liquid phase, ¤ <sub>C3</sub> H <sub>9</sub> N		
]				<sup>2</sup> <sup>3<sup>H</sup>9<sup>N</sup></sup>		
			T/K			
	<sup>ж</sup> с <sub>з</sub> н <sub>9</sub> м	253.15	273.15	293.15		
		·····				
	0 0.0055	14.4 14.9	46.0 46.9	121.7 124.3		
(	0.0114	14.9	48.9	124.3		
	0.0321	17.4 19.9	53.0 60.0	137.3 153.3		
	0.0679 0.0880	21.0	63.5	153.5		
	0.1503	23.9 24.5	71.7 74.0	181.1		
	0.1715 0.210	25.5	77.8	186.9 196.6		
	0.229 0.277	26.0 26.7	79.3 82.4	200.8 209.4		
ļ	0.296	27.1	83.6	212.5		
	0.360 0.402	28.2 28.6	87.0 88.7	222.3 227.5		
	0.451	29.3	90.9	233.7		
	0.527 0.608	29.8 30.4	93.1 95.2	240.7 247.1		
	0.628	30.2	95.5	248.0		
				Cont.		
		AUXILIARY	INFORMATION			
METHOD /APPAR	ATUS/PROCEDURE:		SOURCE AND PURIT	TY OF MATERIALS:		
Apparatus	described prev	iouely was	1. From commercial propylammonium chloride by reaction with KOH;			
used (1).	Liquid mixtur	es of	dried with	n KOH and with Li;		
	y known composi d into a cell h			y fractionated until the last fractions had the		
thermosta	t controlled to	± 0.02 <sup>0</sup> C.	same vapor	r pressure as measured by		
The total vapor pressures were				. (See ref. l.) L product; dried with		
measureu	measured by a mercury manometer.			eatedly fractionated		
	The authors calculated activity coefficients of each component from			st and last fractions had vapor pressure as		
the vapor pressure data by a method described by Barker (2). Constants for Redlich-Kister equations (3) for				by the manometer (1).		
			ESTIMATED ERROR	:		
	activity coefficients were evaluated			)2 (estimated by authors)		
and repor	ted.					
			REFERENCES:	UNDEROR D 7 87-14		
				Höpfner, A. Z. Elektro- 2, 66, 149.		
			2. Barker, J.	A. Aust. J. Chem. <u>1953</u> ,		
			6, 207. 3. Redlich, C	D.; Kister, A.T. Ind. Eng.		
				3, 21, 345.		
			J	· · · · · · · · · · · · · · · · · · ·		

COMPONENTS:		·	ORIGINAL MEASUREMENTS:			
с <sub>3</sub> н9	anamine, (prop N; [107-10-8] ; C <sub>6</sub> H <sub>14</sub> ; [110-		Wolff, H.; Höpfner, A.; Höpfner, HM Ber. Bunsenges. Phys. Chem. <u>1964</u> , 68, 410-417.			
VARIABLES:			PREPARED BY:			
Com	position, temp	erature	P. G. T. Fogg			
EXPERIMENTAL	VALUES: Cont	•				
			т/к			
	<sup>ж</sup> с <sub>3</sub> н <sub>9</sub> и	253.15	273.15	293.15		
	0.680 0.725 0.796 0.910 0.971 1	30.6 30.8 30.7 30.2 29.6 29.0	96.4 97.1 98.0 97.1 95.5 94.2	250.0 253.5 255.5 255.8 253.3 252.6		
<b>^</b> -	notonto for as	lawlahian of -	ctivity coeffic	cients from the		
Cc	Redli T/K	ch-Kister equa	ations given be: B	low C		
Cc	Redli	ch-Kister equa	tions given be.	Low		
ln $f_1$	Redli T/K 253.15 263.15 273.15 283.15 293.15 = A $x_2^2$ -	Ch-Kister equa A 1.253 1.165 1.099 1.024 0.947 B $x_2^2(1 - 4x)$	$ \begin{array}{c}     B \\     -0.070 \\     -0.034 \\     -0.002 \\     0.002 \\     0.008 \\   \end{array} $ $     x_1) + C x_2^2(1) $	$ \begin{array}{c} C \\ 0.090 \\ 0.059 \\ 0.041 \\ 0.042 \\ 0.015 \\ \end{array} $ $ - 8 x_1 + 12 x_1^2) $		
ln $f_1$	Redli T/K 253.15 263.15 273.15 283.15 293.15 = A $x_2^2$ -	Ch-Kister equa A 1.253 1.165 1.099 1.024 0.947 B $x_2^2(1 - 4x)$	$ \begin{array}{c}     B \\     -0.070 \\     -0.034 \\     -0.002 \\     0.002 \\     0.008 \\   \end{array} $ $     x_1) + C x_2^2(1) $	C 0.090 0.059 0.041 0.042 0.015		

COMPONENTS:	· · · · · · · · · · · · · · · · · · ·		ORIGINAL MEASUREMENTS:				
	inc. O U N	. [107-10-0]					
-		; [107-10-8]	Wolff, H.; Shadiakhy, A.				
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [1	10-54-3]	F	luid P	hase Equilib	ria	
1			1 1	<u>983</u> , 1	1, 267-287.		
VARIABLES:	····		PRE	PARED BY	<pre>{;</pre>		
					С. L. У	oung	
1					0. 1. 1	oung	
EXPERIMENTAL V	VALUES:						
т/к	<i>x</i> 1	P/kPa	т/	ĸ	<i>x</i> 1	P/kPa	
293.15	$\begin{array}{c} 0\\ 0.048,\\ 0.097,\\ 1\\ 0.150,\\ 0.183,\\ 0.234,\\ 0.284,\\ 0.348,\\ 0.377,\\ 0.429,\\ 0.429,\\ 0.429,\\ 0.483,\\ 0.543,\\ 0.543,\\ 0.584,\\ 0.659,\\ 0.768,\\ 0.708,\\ 0.767,\\ 0.804,\\ 0.877,\\ 0.938,\\ 0.975,\\ 1\end{array}$	16.17 $19.13$ $21.80$ $24.12$ $25.30$ $26.77$ $27.97$ $29.98$ $30.76$ $31.50$ $32.29$ $32.60$ $33.29$ $33.69$ $34.04$ $34.22$ $34.44$ $34.33$ $33.93$ $33.85$	30	3.15	$\begin{array}{c} 0\\ 0.048\\0971\\ 0.149\\036\\ 0.233\\ 0.233\\ 0.2341\\ 0.347\\ 0.3777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\03777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\0377\\ 0.3777\\ 0.429\\037\\ 0.543\\ 0.543\\ 0.583\\ 0.597\\037\\ 0.583\\ 0.597\\037\\ 0.593\\ 0.597\\037\\ 0.593\\ 0.597\\ 0.59$	25.00 29.28 33.00 36.36 38.05 40.32 42.25 44.41 45.28 46.56 47.80 49.01 49.72 50.68 51.37 52.08 52.33 52.65 52.72 52.34 52.16 (cont.)	
		AUXILIARY	INFO	RMATION			
METHOD APPARAT	TUS / PROCEDURE		- <b>T</b>		PURITY OF MATE	RIAIS	
		eviously was	1. Fluka purissima grade, frac-				
used (1), (2		d mixtures of	1.			99.5 mole per	
accurately }	-			cent.			
introduced i			2. Purity 99.97 mole per cent,				
thermostat o	controlled	to ±0.02 °C.	degassed, dried over molecular				
The total p	ressure was	measured		sieve.			
using a merc	cury manome	ter. The	EST	IMATED E		+0.02	
authors cald	culated act	ivity co-			0T/K =	±0.02.	
efficients o				ERENCES:			
method desci Constants fo		rker (3). on equation (4)	1.	<ol> <li>Wolff, H.; Höppel, H. E. Ber. Bunsenges. Phys. Chem. 1966, 70, 874.</li> </ol>			
were evaluated and reported.				<ol> <li>Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria 1981, 7, 309.</li> </ol>			
			3. Barker, J. A. Aust. J. Chem. <u>1953</u> , 6, 207.			t. J. Chem.	
			4. Wilson, G. M. J. Am. Chem. Soc. <u>1964</u> , 86, 127.				
			1				

COMPONENTS:		<u> </u>	ORIGINAL MEASUREMENTS:				
1. Propana	mime; C <sub>3</sub>	H <sub>9</sub> N; [107-10-8]	Wolff, H.; Shadiakhy, A.				
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ;	[110-54-3]	Fluid P	Fluid Phase Equilibria			
			1983, 1	1, 267-287.			
EXPERIMENTAL V	ALUES:		-1				
т/к	$x_1$	P/kPa	T/K	$x_1$	P/kPa		
313.15	$\begin{array}{c} 0\\ 0.048\\ +\\ 0.097\\ 0.149\\ 6\\ 0.183\\ 2\\ 0.233\\ 6\\ 0.347\\ 6\\ 0.347\\ 6\\ 0.377\\ +\\ 0.429\\ 3\\ 0.482\\ 8\\ 0.542\\ 8\\ 0.542\\ 8\\ 0.583\\ 8\\ 0.659\\ 6\\ 0.708\\ 7\\ 0.767\\ 1\\ 0.804\\ 7\\ 0.877\\ 5\\ 0.938\\ 6\\ 0.975\\ 6\\ 1\end{array}$	37.26 43.13 48.26 53.14 55.54 58.82 61.70 64.94 66.22 68.19 70.06 71.98 72.99 74.59 75.83 76.79 77.23 77.83 78.22 77.85 77.52	333.15	0 0.0484 0.0969 0.1491 0.1827 0.2329 0.2832 0.3768 0.4287 0.4287 0.4822 0.5423 0.5423 0.5833 0.6593 0.7084 0.7669 0.8045 0.8756 0.9756 1	76.23 86.43 95.58 104.26 108.82 115.22 121.02 127.47 130.23 134.47 138.43 142.41 144.83 142.41 144.83 148.61 151.07 153.36 154.63 156.40 157.53 157.21 157.38		
323.15	$\begin{array}{c} 0\\ 0.048\\ 0.097\\ 0.149\\ 0.183\\ 0.233\\ 0.283\\ 0.347\\ 0.3771\\ 0.429\\ 0.482\\ 0.542\\ 0.542\\ 0.583\\ 0.559\\ 0.708\\ 0.583\\ 0.659\\ 0.708\\ 0.708\\ 0.975\\ 0.975\\ 1\end{array}$	54.02 61.81 68.71 75.37 78.70 83.39 87.54 92.17 94.09 97.01 99.83 102.67 104.15 106.80 108.47 110.02 110.82 111.90 112.48 112.14 112.10	343.15	$\begin{array}{c} 0\\ 0.048_{3}\\ 0.096_{9}\\ 0.148_{8}\\ 0.182_{3}\\ 0.232_{6}\\ 0.282_{8}\\ 0.346_{5}\\ 0.376_{4}\\ 0.428_{3}\\ 0.428_{3}\\ 0.481_{9}\\ 0.542_{0}\\ 0.583_{0}\\ 0.659_{1}\\ 0.708_{3}\\ 0.766_{8}\\ 0.804_{4}\\ 0.877_{3}\\ 0.938_{6}\\ 0.975_{6}\\ 1\end{array}$	105.19 118.14 129.86 140.96 147.03 155.59 163.45		
Consta equation an		calculation of a coelow:	ctivity coe	efficients f	rom the Wilson		
	T/K		Λ <sub>12</sub>		Λ <sub>21</sub>		
	293.15 303.15 313.15 323.15 333.15 343.15		0.60548 0.65456 0.69946 0.74127 0.78189 0.83492		0.56004 0.56910 0.57555 0.59089 0.60184 0.60299		
				(cont.)			

COMPONENTS :	ORIGINAL MEASUREMENTS:		
l. Propanamine; C <sub>3</sub> H <sub>9</sub> N; [107-10-8]	Wolff, H.; Shadiakhy, A.		
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	Fluid Phase Equilibria		
	<u>1983</u> , <i>11</i> , 267-287.		

EXPERIMENTAL VALUES:

,

$$\ln f_{1} = -\ln (x_{1} + \Lambda_{12}x_{2}) + x_{2} \left( \frac{\Lambda_{12}}{x_{1} + \Lambda_{12}x_{2}} - \frac{\Lambda_{21}}{x_{2} + \Lambda_{21}x_{1}} \right)$$
$$\ln f_{2} = -\ln (x_{2} + \Lambda_{21}x_{1}) - x_{1} \left( \frac{\Lambda_{12}}{x_{1} + \Lambda_{12}x_{2}} - \frac{\Lambda_{21}}{x_{2} + \Lambda_{21}x_{1}} \right)$$

where	fı	8	activity coefficient of amine
	f <sub>2</sub>	=	activity coefficient of hexane
	$x_1$	=	mole fraction of amine in liquid
	x 2	=	mole fraction of hexane in liquid.

Solubilities of Other Amines

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. l-Propanamine-d<sub>2</sub>; C<sub>3</sub>H<sub>7</sub>ND<sub>2</sub>; [25837-80-3]</pre>	Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	
	<u>1983</u> , <i>11</i> , 267-287.
VARIABLES:	PREPARED BY:
	C. L. Young
EXPERIMENTAL VALUES:	
T/K $x_1$ $P/kPa$	T/K $x_1$ $P/kPa$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$303.15 \qquad 0 \qquad 25.00 \\ 0.046_6 \qquad 29.20 \\ 0.098_9 \qquad 33.06 \\ 0.150_7 \qquad 36.26 \\ 0.211_8 \qquad 39.13 \\ 0.245_0 \qquad 40.64 \\ 0.285_7 \qquad 42.14 \\ 0.348_1 \qquad 44.05 \\ 0.421_4 \qquad 45.97 \\ 0.449_6 \qquad 46.61 \\ 0.496_4 \qquad 47.57 \\ 0.555_1 \qquad 48.61 \\ 0.607_2 \qquad 49.44 \\ 0.657_4 \qquad 50.17 \\ 0.707_9 \qquad 50.80 \\ 0.752_7 \qquad 51.22 \\ 0.812_1 \qquad 51.60 \\ 0.875_0 \qquad 51.81 \\ 0.922_1 \qquad 51.73 \\ 0.969_5 \qquad 51.46 \\ 1 \qquad 50.95 \\ (cont.)$
AUXIL:	IARY INFORMATION
METHOD APPARATUS/PROCEDURE: Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were introduced into a cell held in a thermostat controlled to ±0.02 °C.	i mole per cent D <sub>2</sub> O. Purity
The total pressure was measured using a mercury manometer. The	$\delta T/K = \pm 0.02.$
authors calculated activity co- efficients of each component by a method described by Barker (3). Constants for the Wilson equation were evaluated and reported.	<ul> <li>REFERENCES:</li> <li>1. Wolff, H.; Höppel, H. E. Ber. Bunsenges. Phys. Chem. <u>1966</u>, 70, 874.</li> <li>(4)</li> <li>2. Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria <u>1981</u>, 7, 309.</li> <li>3. Barker, J. A. Aust. J. Chem. <u>1953</u>, 6, 207.</li> </ul>
	4. Wilson, G. M. J. Am. Chem. Soc. <u>1964</u> , 86, 127.

Solubilities of Other Amines

COMPONENTS :			ORIGINAL ME	ASUREMENTS:	
1. 1-Propan [25837-8	amine-d <sub>2</sub> ; 0-3]	C <sub>3</sub> H <sub>7</sub> ND <sub>2</sub> ;		.; Shadiakhy,	Α.
		[110-54-3]	Fluid Ph	ase Equilibria	
2. Hexane;	C6H147	[110-34-3]	<u>1983</u> , 11	, 267-287.	
EXPERIMENTAL V	ALUES:	<del>_</del>			
т/к	<i>x</i> 1	P/kPa	T/K	<i>x</i> 1	P/kPa
313.15	$\begin{array}{c} 0\\ 0.046_{6}\\ 0.098_{8}\\ 0.150_{5}\\ 0.211_{6}\\ 0.244_{8}\\ 0.285_{5}\\ 0.347_{9}\\ 0.421_{2}\\ 0.449_{3}\\ 0.496_{2}\\ 0.554_{9}\\ 0.607_{0}\\ 0.657_{2}\\ 0.707_{8}\\ 0.752_{6}\\ 0.812_{1}\\ 0.875_{0}\\ 0.922_{1}\\ 0.969_{5}\\ 1\end{array}$	64.46 67.42 68.41 69.90 71.53 72.90 73.98 75.01 75.62 76.39	333.15	$\begin{array}{c} 0\\ 0.046_{6}\\ 0.098_{7}\\ 0.150_{0}\\ 0.211_{0}\\ 0.244_{2}\\ 0.284_{8}\\ 0.347_{3}\\ 0.420_{6}\\ 0.448_{8}\\ 0.495_{7}\\ 0.554_{5}\\ 0.606_{6}\\ 0.656_{9}\\ 0.707_{6}\\ 0.752_{4}\\ 0.812_{0}\\ 0.874_{9}\\ 0.922_{1}\\ 0.969_{5}\\ 1\end{array}$	76.23 86.13 95.59 104.02 111.99 116.12 120.63 126.84 133.08 135.19 138.51 142.09 145.03 147.65 149.83 151.59 153.45 154.87 155.45 155.63 155.10
323.15	$\begin{array}{c} 0 \\ 0.046_{6} \\ 0.098_{8} \\ 0.150_{3} \\ 0.211_{3} \\ 0.244_{5} \\ 0.285_{2} \\ 0.347_{6} \\ 0.420_{9} \\ 0.449_{1} \\ 0.496_{0} \\ 0.554_{7} \\ 0.606_{9} \\ 0.657_{1} \\ 0.707_{7} \\ 0.752_{5} \\ 0.812_{0} \\ 0.874_{9} \\ 0.922_{1} \\ 0.969_{5} \\ 1 \end{array}$	54.02 61.61 68.93 75.19 81.03 84.03 87.25 91.65 95.97 97.49 99.66 102.28 104.19 105.91 107.46 108.52 109.71 110.56 110.84 110.75 110.27	343.15	$\begin{array}{c} 0 \\ 0.046 \\ \text{s} \\ 0.0987 \\ 0.1497 \\ 0.2107 \\ 0.2438 \\ 0.2844 \\ 0.3469 \\ 0.4202 \\ 0.4484 \\ 0.4953 \\ 0.5542 \\ 0.6064 \\ 0.6567 \\ 0.7074 \\ 0.7523 \\ 0.8119 \\ 0.8748 \\ 0.9220 \\ 0.9695 \\ 1 \end{array}$	105.19 117.78 129.99 140.84 151.55 157.15 163.21 171.84 180.36 183.32 187.96 193.13 197.22 200.78 204.12 206.57 209.49 211.77 212.92 213.37 213.12
Consta equation ar	e given b T/K 293.15	alculation elow:	of activity coe $\Lambda_{12}$ 0.61398	Λ <sub>21</sub> 0.5320ι	the Wilson
	303.15 313.15 323.15 333.15 343.15		0.65951 0.70431 0.75043 0.81005 0.84849	0.5471 <sub>8</sub> 0.56223 0.57249 0.56847 0.58263 (cont.)	

COMPO	NENTS:	ORIGINAL MEASUREMENTS:
1. 2.	l-Propanamine-d <sub>2</sub> ; C <sub>3</sub> H <sub>7</sub> ND <sub>2</sub> ; [25837-80-3] Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria 1983, 11, 267-287.

EXPERIMENTAL VALUES:

$$\ln f_1 = -\ln (x_1 + \Lambda_{12} x_2) + x_2 \left( \frac{\Lambda_{12}}{x_1 + \Lambda_{12} x_2} - \frac{\Lambda_{21}}{x_2 + \Lambda_{21} x_1} \right)$$

$$\ln f_2 = -\ln (x_2 + \Lambda_{21}x_1) - x_1 \left( \frac{\Lambda_{12}}{x_1 + \Lambda_{12}x_2} - \frac{\Lambda_{21}}{x_2 + \Lambda_{21}x_1} \right)$$

where	fl	=	activity coefficient of amine
	f₂	=	activity coefficient of hexane
	$x_1$	=	mole fraction of amine in liquid
	x 2	=	mole fraction of hexane in liquid.

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COMPONENTS :	ORIGINA	L MEASUREMENTS:		
<pre>1. 1-Propanamine (n-Propylamine);     C<sub>3</sub>H<sub>9</sub>N; [107-10-8]</pre>	Zell	ey, M.J.; Ginsb hoefer, G.F.; M		
2. Octanol, glycols and glycerol	J. Amer. Chem. Soc.			
	<u>1941</u>	<i>63</i> , 254-256.		
VARIABLES:	PREPARE	D BY:		
		P. G. T.	Fogg	
EXPERIMENTAL VALUES:	•			
Solvent	т/к	<sup>P</sup> C3H9N <sup>/mmHg*</sup>	Mole fraction <sup>x</sup> C <sub>3</sub> H <sub>9</sub> N	
1-Octanol; C <sub>8</sub> H <sub>18</sub> O; [111-87-5]	305.4	106	0.408	
1,2-Ethanediol (ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	305.4	106	0.465	
1,3-Butanediol (1,3-butylene glycol) C4 <sup>H</sup> 10 <sup>O</sup> 2; [107-88-0]	305.4	106	0.460	
1,2,3-Propanetriol (glycerol); C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> ; [56-81-5]	305.4	106	0.497	
2,2'-Oxybis-ethanol, (diethylene glycol); C <sub>4</sub> H <sub>10</sub> O <sub>3</sub> ; [111-46-6]	305.4	106	0.510	
2,2'-[1,2-ethanediylbis(oxy)]bis- ethanol, (triethylene glycol); C <sub>6</sub> H <sub>14</sub> O <sub>4</sub> ; [112-27-6]	305.4	106	0.519	
760 mmHg = 1 atm * The pressure of propanamine was sai vapor pressure at 4.5°C. The autho pressure at several temperatures an plot of the logarithm of the vapor	d by th rs stat d deter	e authors to co ed that they me mined the value	easured the vapor at 4.5°C from a	
AUXILIARY	INFORMAT	ION		
METHOD /APPARATUS / PROCEDURE :	SOURCE A	AND PURITY OF MATE	RIALS:	
The absorption apparatus was developed for studies of refrigerat- ion systems (ref. (1)) and consisted of a copper drum, 4 x 12 cm, fitted with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm <sup>3</sup> of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2°C. The drum was agitated and propanamine vapor	mater caref fract feasi	uthors stated t ials used were ully by chemica ional distillat ble.	all purified 1 means and	
allowed to flow slowly into it until the final pressure corresponded to	ESTIMAT	ED ERROR:		
the vapor pressure of propanamine at 4.5°C. The drum and contents were weighed again to find the weight of				
vapor which had been absorbed.	REFEREN	CES:	······	
	1	llhoefer, G.F. <u>37</u> , <i>29</i> , 548.	Ind. Eng. Chem.	

## Solubilities of Other Amines

COMPONENTS			ORICINAL ME	CUDENCY		
COMPONENTS:			ORIGINAL MEASUREMENTS:			
$C_3H_9N;$	[75-31-0]	<pre>propylamine);</pre>	Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria			
2. Hexane;	C <sub>6</sub> H <sub>14</sub> ; [1	10-54-3]	1083 11	, 267-287.		
			<u>1985</u> , 11	, 207-207.		
VARIABLES:			PREPARED BY			
				C. L. Youn	g	
EXPERIMENTAL	VALUES:	<u></u>	<u> </u>			
т/к	<i>x</i> 1	P/kPa	т/к	<i>x</i> 1	P/kPa	
283.15	$\begin{array}{c} 0\\ 0.046_9\\ 0.098_3\\ 0.154_6\\ 0.189_0\\ 0.250_0\\ 0.290_6\\ 0.336_1\\ 0.369_3\\ 0.432_9\\ 0.516_0\\ 0.566_0\\ 0.601_2\\ 0.664_4\\ 0.707_0\\ 0.751_1\\ 0.820_7\\ 0.869_6\\ 0.936_8\\ 0.967_2\\ 1\end{array}$	10.0914.1117.7220.9722.5625.2126.6128.0429.0130.7232.6133.6134.2435.5436.3737.1338.3339.1440.2440.7641.26	293.15	$\begin{array}{c} 0 \\ 0.046_9 \\ 0.098_3 \\ 0.154_4 \\ 0.188_7 \\ 0.249_7 \\ 0.290_3 \\ 0.335_8 \\ 0.369_0 \\ 0.432_6 \\ 0.515_7 \\ 0.565_7 \\ 0.565_7 \\ 0.601_0 \\ 0.664_2 \\ 0.706_9 \\ 0.751_0 \\ 0.820_6 \\ 0.869_5 \\ 0.936_8 \\ 0.967_2 \\ 1 \end{array}$	16.17 21.74 27.05 31.84 34.22 38.17 40.30 42.60 44.14 46.78 49.77 51.46 52.62 54.52 55.81 57.02 59.00 60.32 62.05 62.82 63.61	
		AUXILIARY	INFORMATION			
METHOD APPAR	ATUS/PROCEDURE:		SOURCE AND I	PURITY OF MATER	IALS:	
Apparatus	described pre	eviously was	l. Fluka	purissima g	rade, frac-	
used (1),	-	l mixtures of		ted, purity		
-	known compos		per cent.			
· · ·	into a cell					
thermostat	controlled t	to ±0.02 °C.	2. Purity 99.97 mole per cent, degassed, dried over molecular			
The total	pressure was	measured	sieve.			
using a me	rcury manomet	er. The	ESTIMATED EF	-		
authors ca	lculated acti	lvity co-		$\delta T/K = \pm 0.02.$		
efficients	of each comp	ponent by a	REFERENCES:			
Constants		on equation (4)	<ol> <li>Wolff, H.; Höppel, H. E. Ber. Bunsenges. Phys. Chem. <u>1966</u>, 70, 874.</li> </ol>			
were evalu	ated and repo	orted.	2. Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria 1981, 7, 309.			
			3. Barker, J. A. Aust. J. Chem. <u>1953</u> , 6, 207.			
			4. Wilson <u>1964</u> ,	, G. M. J. A 86, 127.	m. Chem. Soc.	

<pre>COMPONENTS: 1. 2-Propanamine (iso-propylamine); C<sub>3</sub>H<sub>9</sub>N; [75-31-0] 2. Hexane; C<sub>6</sub>H<sub>14</sub>; [110-54-3]</pre>			ORIGINAL MEASUREMENTS Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria 1983, 11, 267-287.		
EXPERIMENTAL V	ALUES:	- mai	<u></u>		
т/к	$x_1$	P/kPa	т/к	<i>x</i> 1	P/kPa
303.15	0 0.0469 0.0982 0.1541 0.1884 0.2494 0.2899 0.3354 0.3687 0.4322 0.5154 0.4322 0.5554 0.6007 0.5654 0.6007 0.5654 0.6007 0.5654 0.6007 0.5654 0.6007 0.6640 0.7067 0.7508 0.8205 0.8695 0.9368 0.982 0.1538 0.1880 0.24895 0.3350 0.3682	87.45 89.50 92.15 93.23 94.60 37.26 47.46 57.28 66.54 71.05 79.23 84.02	323.15	$\begin{array}{c} 0\\ 0.046_{8}\\ 0.098_{1}\\ 0.153_{4}\\ 0.187_{6}\\ 0.248_{4}\\ 0.289_{0}\\ 0.334_{4}\\ 0.367_{7}\\ 0.431_{3}\\ 0.514_{5}\\ 0.564_{6}\\ 0.599_{9}\\ 0.663_{3}\\ 0.706_{1}\\ 0.750_{3}\\ 0.820_{2}\\ 0.936_{7}\\ 0.967_{1}\\ 1\\ 0\\ 0.046_{8}\\ 0.098_{1}\\ 0.153_{0}\\ 0.187_{1}\\ 0.247_{9}\\ 0.288_{4}\\ 0.333_{8}\\ 0.367_{1}\\ \end{array}$	54.02 67.26 80.13 92.41 98.51 109.62 116.23 123.07 127.82 136.10 145.97 151.45 155.15 161.49 165.49 169.63 176.05 180.29 186.06 188.53 191.23 76.23 93.03 109.32 125.42 133.68 148.24 157.20 166.49 172.89
equation are	0.431 0.515 0.565 0.600 0.6637 0.706 0.8203 0.8693 0.9367 0.9671 1 	98.02 104.92 108.79 111.31 115.68 118.54 121.31 125.83 128.76 132.80 134.50 136.36 alculation of ac elow: A 0.5 0.6	12 940 <sub>0</sub> 427 <sub>2</sub>	0.4307 0.5140 0.5641 0.5995 0.6629 0.7058 0.7500 0.8199 0.8690 0.9366 0.9670 1 ficients fro	184.25 198.09 205.69 211.02 219.66 225.35 231.14 240.03 246.11 254.41 257.67 261.57 m the Wilson
303.15 313.15 323.15 333.15		0.7 0.7	905₅ 325₅ 7957 1842	0.61149 0.62334 0.63104 0.64446 (cont.)	

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. 2-Propanamine (iso-propylamine); C<sub>3</sub>H<sub>9</sub>N; [75-31-0]</pre>	Wolff, H.; Shadiakhy, A.
	Fluid Phase Equilibria
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]	<u>1983</u> , <i>11</i> , 267-287.

EXPERIMENTAL VALUES:

$$\ln f_{1} = -\ln (x_{1} + \Lambda_{12}x_{2}) + x_{2} \left( \frac{\Lambda_{12}}{x_{1} + \Lambda_{12}x_{2}} - \frac{\Lambda_{21}}{x_{2} + \Lambda_{21}x_{1}} \right)$$
$$\ln f_{2} = -\ln (x_{2} + \Lambda_{21}x_{1}) - x_{1} \left( \frac{\Lambda_{12}}{x_{1} + \Lambda_{12}x_{2}} - \frac{\Lambda_{21}}{x_{2} + \Lambda_{21}x_{1}} \right)$$

where  $f_1$  = activity coefficient of amine  $f_2$  = activity coefficient of hexane  $x_1$  = mole fraction of amine in liquid  $x_2$  = mole fraction of hexane in liquid.

COMPONENTS:			ORIGINAL MEAS	UDEMENTC .							
	namine-d. C	H-ND . :			. A.						
	L. 2-Propanamine- $d_2$ ; $C_3H_7ND_2$ ; [7395-10-0]		Wolff, H.; Shadiakhy, A. Fluid Phase Equilibria								
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]		1983, 11,	267-287.								
			· ·								
VARIABLES:			PREPARED BY:		······································						
			C. L. Young								
				с. п.	roung						
EXPERIMENTAL	VALUES:		L								
T/K	<i></i>	P/kPa	т/к	жı	P/kPa						
	~1	1 / MI 4	2,	<b>-</b>	- ,						
283.15	0	10.09	293.15	0	16.17						
	0.0520	14.36		0.0520	22.24						
	$0.105_{3}$	18.03		0.1053	27.50 31.78						
	0.157 <sub>3</sub> 0.1989	20.88 22.76		$0.157_{1}$ $0.198_{6}$	31.78						
	0.2334	24.14		0.2331	36.66						
	0.2995	26.45		0.233 <sub>1</sub> 0.299 <sub>2</sub>							
	0.3474	27.92		0.3470	42.54						
	0.399 <sub>1</sub> 0.4537	29.36 30.61		0.398₀ 0.453₅	44.76 46.89						
	0.5161	31.96		0.515,	49.05						
	0.5674	33.00		0.5671	50.77						
	0.6212	34.00		0.6210	52.38						
	$0.673_7$	34.93 35.72		0.673 <sub>5</sub> 0.714 <sub>6</sub>	53.88 55.08						
	0.714 <sub>8</sub> 0.787 <sub>7</sub>	35.72		0.7876							
	0.821 <sub>6</sub> 0.880 <sub>2</sub>	37.53		0.821	57,92						
				0.8801	59.42						
	$0.925_{8}^{-}$ 0.970 <sub>5</sub>	39.10 39.81		0.925₀ 0.970₅	60.62 61.69						
	1	40.14		1	62.31						
					(cont.)						
		· · · · · · · · · · · · · · · · · · ·									
		AUXILIARY	INFORMATION								
METHOD APPARA	TUS/PROCEDURE:			URITY OF MATERI							
			1. Prepare	d via exchang	e reaction of						
Apparatus described previously was used (1), (2). Liquid mixtures of accurately known composition were introduced into a cell held in a		<ul> <li>non-deuterated amine with 99.7</li> <li>mole per cent D<sub>2</sub>O. Purity</li> <li>better than 99 mole per cent.</li> <li>Dried.</li> <li>2. Purity 99.97 mole per cent, de- gassed, dried over molecular</li> </ul>									
							controlled to		gassed, sieve.	dried over	molecular
									ESTIMATED ER		
						-	pressure was i		ESTIMATED ER	$\delta T/K = \pm$	0 02
	cury manomet			0.1/K = 1	0.02						
	lculated activ	-	REFERENCES:		-						
efficients	of each comp	onent by a	1	u . uännal	u r						
method described by Barker (3).		1. Wolff, H.; Höppel, H. E. Ber. Bunsenges. Phys. Chem.									
		n equation (4)		0, 874.							
	ated and report			H.; Shadiak	hy, A.						
were evalua	ited and repo.			Phase Equilib							
			<u>1953</u> , 6								
				, G. M. J. Am 36, 127.	a. Chem. Soc.						
			<u> </u>								

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Solubilities of Other Amines

12		Solubiliti	es of Other Amine	S		
COMPONENTS:	<del></del>	<u></u>	ORIGINAL ME	ORIGINAL MEASUREMENTS:		
<pre>1. 2-Propanamine-d<sub>2</sub>; C<sub>3</sub>H<sub>7</sub>ND<sub>2</sub>; [7395-10-0]</pre>			Wolff, H	Wolff, H.; Shadiakhy, A.		
-	-		Fluid Pl	ase Equilibr	ia	
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]			<u>1983</u> , <i>11</i> , 267-287.			
EXPERIMENTA	L VALUES:	<u> </u>		196- 	<u></u>	
т/к	<i>x</i> 1	P/kPa	т/К	<i>x</i> 1	P/kPa	
303.15	0	25.00	323.15	0	54.02	
	$0.051_9$ $0.105_2$	33.28 40.58		0.051 <sub>9</sub> 0.105 <sub>1</sub>	68.31 81.29	
	0.156 <sub>8</sub> 0.198 <sub>3</sub>	46.65 50.56		0.1561 0.1975	92.43 99.83	
	0.2327	53.74		0.2318	105.96	
	0.298 <sub>9</sub> 0.3467	59.05 62.47		0.2979 0.3457	116.68 123.67	
	0.3984	65.87		0.3974	130.64	
	0.4531 0.5155	69.07 72.43		0.4522 0.5146	137.47 144.64	
	0.5668	75.01		0.5660	150.08	
	0.6208 0.6733	77.53 79.90		0.6201 0.6727	155.68 160.84	
	0.7144	81.79		0.713,	164.67	
	0.7874 0.8214	84.71 86.11		0.787₀ 0.821₁	171.21 174.21	
	0.8801	88.45		0.8798	179.25	
	0.925 <sub>8</sub> 0.9704	90.26 91.97		0.925 <sub>6</sub> 0.9704	183.13 186.72	
	1	92.94		1	189.09	
313.15	0	37.26	333.15	0	76.23	
	0.051 <sub>9</sub> 0.1052	48.33 58.24		0.051 <sub>8</sub> 0.1050	94.35 110.87	
	0.1565	66.62		0.155,	125.44	
	0.197 <sub>9</sub> 0.232 <sub>3</sub>	71.91 76.46		0.197 <sub>0</sub> 0.231 <sub>3</sub>	135.31 143.53	
	0.2984	84.18		0.2973	157.97	
	0.346 <sub>2</sub> 0.398 <sub>0</sub>	89.15 94.09		0.3451 0.3968	167.52	
	0.4527	98.81		0.398%	177.03 186.52	
	0.5151	103.83		0.5141	196.66	
	0.5665 0.6205	107.67 111.42		0.565 <sub>5</sub> 0.619 <sub>6</sub>	204.30 212.02	
	0.673	114.92		0.6723	219.24	
	0.714 <sub>2</sub> 0.787 <sub>2</sub>	117.62 122.19		0.713₅ 0.7868	224.58 233.83	
	0.8213	124.23		0.8209	238.21	
	0.880 <sub>0</sub> 0.925 <sub>7</sub>	127.79 130.39		0.8797 0.9255	245.34 250.70	
	0.9704	132.94		0.9704	255.87	
	1	134.46		÷	259.20	
Const equation a	ants for cal are given bel	culation of	activity coef	ficients from	n the Wilson	
	T/K		Λ <sub>12</sub>	Λ <sub>21</sub>		
	283.15 293.15		0.5998 <sub>3</sub> 0.6393 <sub>0</sub>	0.5755		
	303.15		0.68563	0.613	•	
	313.15		0.7289	0.6255		
	323.15 333.15		0.7789 <sub>9</sub> 0.82494	0.6331 0.6412		
				(cont.)	_	

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. 2-Propanamine-d<sub>2</sub>; C<sub>3</sub>H<sub>7</sub>ND<sub>2</sub>;</pre>	Wolff, H.; Shadiakhy, A.
[7395-10-0]	Fluid Phase Equilibria
2. Hexane; C <sub>6</sub> H <sub>1</sub> 4; [110-54-3]	<u>1983</u> , 11, 267-287.

EXPERIMENTAL VALUES:

$$\ln f_1 = -\ln (x_1 + \Lambda_{12}x_2) + x_2 \left( \frac{\Lambda_{12}}{x_1 + \Lambda_{12}x_2} - \frac{\Lambda_{21}}{x_2 + \Lambda_{21}x_1} \right)$$

$$\ln f_2 = -\ln (x_2 + \Lambda_{21}x_1) - x_1 \left( \frac{\Lambda_{12}}{x_1 + \Lambda_{12}x_2} - \frac{\Lambda_{21}}{x_2 + \Lambda_{21}x_1} \right)$$

where  $f_1 = activity$  coefficient of amine  $f_2 = activity$  coefficient of hexane  $x_1 = mole$  fraction of amine in liquid  $x_2 = mole$  fraction of hexane in liquid.

COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. 2-Propanamine (iso-propyl amine); C<sub>3</sub>H<sub>9</sub>N; [75-31-0] 2. Glycols</pre>	Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S. J. Amer. Chem. Soc. <u>1941</u> , 63, 254-256.
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	

Solvent	т/к	<sup>p</sup> C3 <sup>H</sup> 9 <sup>N/mmHg*</sup>	Mole fraction <sup><i>x</i></sup> C3 <sup>H</sup> 9 <sup>N</sup>
l,2-Ethanediol (ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	305.4	223	0.488
2,2'-Oxybis-ethanol, (diethylene glycol); C <sub>4</sub> <sup>H</sup> 10 <sup>O</sup> 3; [lll-46-6]	305.4	223	0.517
2,2'-[1,2-ethanediylbis(oxy)]bis- ethanol, (triethylene glycol); C <sub>6</sub> <sup>H</sup> 14 <sup>0</sup> 4; [112-27-6]	305.4	223	0.552

\* The pressure of 2-propanamine was said by the authors to correspond to its vapor pressure at 4.5°C. The authors stated that they measured the vapor pressure at several temperatures and determined the value at 4.5°C from a plot of the logarithm of the vapor pressure against K/T.

## AUXILIARY INFORMATION

METHOD/APPARATUS/PROCEDURE: SOURCE AND PURITY OF MATERIALS: The authors stated that the The absorption apparatus was materials used were all purified developed for studies of refrigeracarefully by chemical means and tion systems (ref. (1)) and consisted of a copper drum 4 x 12 cm, fitted fractional distillation where feasible. with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm<sup>3</sup> of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2 °C. The drum was agitated and ESTIMATED ERROR: 2-propanamine vapor allowed to flow slowly into it until the final pressure corresponded to the vapor pressure of 2-propanamine at 4.5 °C. The drum and contents were weighed **REFERENCES**: again to find the weight of vapor which had been absorbed. 1. Zellhoefer, G.F. Ind. Eng. Chem. 1937, 29, 548.

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COMPONENTS:	ORIGINAL	L MEASUREMENTS:	
COM ONENTS.	ORIGINA	L HERDOREFIEN 13.	
<pre>1. l-Butanamine, (n-butylamine); C4H11N; [109-73-9]</pre>	Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S.		
1	J. Amer. Chem. Soc.		
2. Glycols and amines	1941, 63, 254-256.		
	<u>1511</u> , 00, 254 250.		
VARIABLES:	PREPARE	D BY:	
		P. G. T. F	ogg
			099
EXPERIMENTAL VALUES:	L		
Solvent	т/к	<sup>p</sup> C4 <sup>H</sup> 11 <sup>N/mmHg*</sup>	Mole fraction ${}^{x}C_{4}{}^{H}_{11}{}^{N}$
l,2-Ethanediol, (ethylene glycol); C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	305.4	24	0.400
2,2'-Oxybis-ethanol, (diethylene glycol); $C_4H_{10}O_3$ ; [111-46-6]	305.4	24	0.384
2,2'-[1,2-ethanediylbis(oxy)]bis- ethanol, (triethylene glycol); C <sub>6</sub> <sup>H</sup> 14 <sup>O</sup> 4; [112-27-6]	305.4	24	0.405
2,2'-[oxybis(2,1-ethanediyloxy)]bis- ethanol, (tetraethylene glycol); C <sub>8</sub> <sup>H</sup> 18 <sup>O</sup> 5; [112-60-7]	305.4	24	0.410
<pre>1,6-Hexanediamine (hexamethylened- iamine); C<sub>6</sub><sup>H</sup>16<sup>N</sup>2; [124-09-4]</pre>	305.4	24	0.144
<pre>N,N'-bis(2-aminoethyl)-l,2-ethan- ediamine, (triethylenetetramine); C<sub>6</sub>H<sub>18</sub>N<sub>4</sub>; [112-24-3]</pre>	305.4	24	0.145
* The pressure of 1-butanamine was sa its vapor pressure at 4.5 <sup>°</sup> C. The a vapor pressure at several temperatu from a plot of the logarithm of the	uthors res and	stated that the determined the	y measured the values at 4.5°C
AUXILIARY	INFORMAT	TION	
METHOD / APPARATUS / PROCEDURE :	SOURCE A	AND PURITY OF MATER	IALS:
The absorption apparatus was	The a	uthors stated t	hat the
developed for studies of refrigerat- ion systems (ref. (1)) and consisted of a copper drum, 4 x 12 cm, fitted with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm <sup>3</sup> of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2°C. The drum was agitated and 1-butanamine vapor	mater caref fract feasi	ials used were a ully by chemica ional distillat ble.	all purified 1 means and
allowed to flow slowly into it until	ESTIMAT	ED ERROR:	
the final pressure corresponded to the vapor pressure of 1-butanamine	[		
at 4.5 <sup>0</sup> C. The drum and contents were weighed again to find the weight of			
vapor which had been absorbed.	REFEREN	CES:	
	1. Zel	lhoefer, G.F. In	nd. Eng. Chem.
	<u>193</u>	<u>7</u> , 29, 548.	
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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. 2-Butanamine, (sec-butylamine); C<sub>4</sub>H<sub>11</sub>N; [13952-84-6]</pre>	Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S.
2. 1,2-Ethanediol, (ethylene glycol); C <sub>2</sub> <sup>H</sup> 6 <sup>O</sup> 2; [107-21-1]	J. Amer. Chem. Soc. <u>1941</u> , 63, 254-256.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	
т/к <sup>P</sup> c4 <sup>H</sup> ll	N <sup>/mmHg*</sup> Mole fraction <sup>x</sup> C4 <sup>H</sup> llN
305.4 56	.5 0.397
vapor pressure at several temperatu	id by the authors to correspond to uthors stated that they measured the
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: The absorption apparatus was developed for studies of refrigerat- ion systems (ref. (1)) and consisted of a copper drum, 4 x 12 cm, fitted with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm <sup>3</sup> of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2°C. The drum was agitated and 2-butanamine vapor allowed to flow slowly into it until the final pressure corresponded to the vapor pressure of 2-butanamine at 4.5°C. The drum and contents were weighed again to find the weight of vapor which had been absorbed.	ESTIMATED ERROR:

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. 2-Methyl-l-propanamine, (iso-butylamine); C4H11N; [78-81-9]</pre>	Copley, M.J.; Ginsberg, E.; Zellhoefer, G.F.; Marvel, C.S. J. Amer. Chem. Soc.
2. 1,2-Ethanediol, (ethylene glycol) C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	. <u>1941</u> , <i>63</i> , 254-256.
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	
т/к р	$C_4H_{11}N^{/mmHg*}$ Mole fraction $C_4H_{11}N^{/mmHg*}$
305.4	45.4 0.381
<pre>760 mmHg = 1 atm = 1.0 * The pressure of 2-methyl-1-propanam correspond to its vapor pressure at they measured the vapor pressure at the value at 4.5°C from a plot of t against 1/(T/K).</pre>	
	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
The absorption apparatus was developed for studies of refrigerat- ion systems (ref. (1)) and consisted of a copper drum, 4 x 12 cm, fitted with a needle valve and two-way outlet with one outlet connected to a manometer. The drum was evacuated to a pressure of 1 mmHg and about 40 cm of solvent drawn into this drum which was then reweighed and immersed in a water bath at 32.2°C. The drum was agitated and the amine vapor allowed to flow slowly into it until the final pressure correspond- ed to the vapor pressure of the amine at 4.5°C. The drum and contents were weighed again to find the weight of vapor which had been absorbed.	The authors stated that the materials used were all purified carefully by chemical means and fractional distillation where feasible.
	<u>1937</u> , 29, 548.

COMPONENTS :	ORIGINAL MEASUREMENTS:
l. N-Ethylethanamine (diethylam C <sub>4</sub> H <sub>ll</sub> N; [109-89-7]	Zellhoefer, G.F.; Marvel, C.S.
2. 1,2-Ethanediol, (ethylene glyc C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	ol); J. Amer. Chem. Soc. <u>1941</u> , 63 254-256.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	
т/к <sup>р</sup> с <sub>4</sub> 1	HllN/mmHg* Mole fraction C4HllN
305.4	88 0.371
760 mmHg = 1 atm = 1.01	3 x 10 <sup>5</sup> Pa.
its vapor pressure at 4.5°C. The the vapor pressure at several to	s said by the authors to correspond to he authors stated that they measured emperatures and determined the value at thm of the vapor pressure against (K/T).
AUXIL	IARY INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
The absorption apparatus was developed for studies of refrigera- ion systems (ref. (1)) and consist of a copper drum, 4 x 12 cm, fitte with a needle valve and two-way outlet with one outlet connected a manometer. The drum was evacuated a pressure of 1 mmHg and about 40 of solvent drawn into this drum wh was then reweighed and immersed in water bath at 32.2°C. The drum wa agitated and diethylamine vapor	ted carefully by chemical means and fractional distillation where feasible. to a d to cm <sup>3</sup> nich a
allowed to flow slowly into it und the final pressure corresponded to the vapor pressure of diethylamine at 4.5 C. The drum and contents were weighed again to find the wei of vapor which had been absorbed.	
	<pre>1. Zellhoefer, G.F. Ind. Eng. Chem. 1937, 29, 548.</pre>

Solubilities of Other Amines

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COMPONENTS				279
י זג זג ד	:		ORIGINAL MEASUREMENTS:	
(Tr [12	Diethylethanamine, riethylamine); C <sub>6</sub> H <sub>16</sub> 21-44-8] D-methane; CH <sub>3</sub> NO <sub>2</sub> ; [		Halban, H. 2. <i>Phys. Chem.</i> <u>1913</u> , 84, 129-159.	
VARIABLES:	<u></u>			
VARIABLES:	Concentration		PREPARED BY: P. G. T. FO	aa
EXPERIMENT	AL VALUES:	·		
т/к с	Concentration of 6 <sup>H</sup> 16 <sup>N</sup> in solution/ mol dm	<sup><i>p</i></sup> C6 <sup>H</sup> 16 <sup>N/m</sup>	Concentration of mHg C <sub>6</sub> H <sub>16</sub> N in solution/ concentration in gas phase	Mole fraction in solution* <sup>xC</sup> 6 <sup>H</sup> 16 <sup>N</sup>
298.2	0.300	13.7	408	0.0159
	0.214	9.76	407	0.0114
	0.190	8.83	400	0.0102
* ~ 7 -			a demoite of the second	t sin i
ref. (		on that dis iquid phase	ne density of the solve ssolution of gas caused 	
ref. ( change	1), on the assumpti of volume of the 1	on that dis iquid phase	ssolution of gas caused	negligible
ref. ( change METHOD/APP/ The part amine ab ions det measured (2) & (3 oxygen, sodium h ed throu amine. stream w acid and	1), on the assumpti	on that dis iquid phase AUXILIARY iethyl- ncentrat- n, were d (refs. drogen and lysis of were pass- triethyl- n the gas ochloric nges in	ssolution of gas caused	negligible ALS: com Kahlbaum; as dried with to ref. (4); n carbonate:

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. N,N-Diethylethanamine, (Triethylamine); C <sub>6</sub> H <sub>16</sub> N;	Halban, H.	
[121-44-8]	Z. Phys. Chem.	
2 Hoverov C H • [1]0-54-31	<u>1913</u> , 84, 129-159.	
2. Hexane; C <sub>6</sub> H <sub>14</sub> ; [110-54-3]		
VARIABLES:	PREPARED BY:	
Concentration	P. G. T. Fogg	
EXPERIMENTAL VALUES:		
Concentration of T/K C6 <sup>H</sup> 16 <sup>N</sup> in solution/ <sup>P</sup> C6 <sup>H</sup> 16 <sup>N·</sup> mol dm	Concentration of Mole fraction /mmHg C <sub>6</sub> H <sub>16</sub> N in solution/ in solution* concentration <sup>x</sup> C <sub>6</sub> H <sub>16</sub> N in gas phase C <sub>6</sub> H <sub>16</sub> N	
298.2 0.300 2.56	2175 0.0380	
0.269 2.35	2129 0.0342	
0.238 2.04	2169 0.0304	
	the density of the solvent given in lissolution of gas caused negligible use.	
ref. (1), on the assumption that of change of volume of the liquid pha	lissolution of gas caused negligible	
ref. (1), on the assumption that of change of volume of the liquid pha AUXILIAN	dissolution of gas caused negligible ase. Y INFORMATION	
ref. (1), on the assumption that of change of volume of the liquid pha	lissolution of gas caused negligible ase.	
ref. (1), on the assumption that on change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs.	Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH.	
ref. (1), on the assumption that on change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an	Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH.	
ref. (1), on the assumption that on change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs.	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na;</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the	Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum <i>n-Hexan aus Propyljodid</i> ; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg). </pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the	Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum <i>n-Hexan aus Propyljodid</i> ; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the barometric pressure and changes in a	Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum <i>n-Hexan aus Propyljodid</i> ; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the	<pre>Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg). ESTIMATED ERROR: REFERENCES:</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the barometric pressure and changes in a copper voltameter in series with the cell for producing the gas. The partial pressures of triethylamine	<pre>Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg). ESTIMATED ERROR: REFERENCES: 1. Dreisbach, R.R. Physical Properties</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the barometric pressure and changes in a copper voltameter in series with the cell for producing the gas. The	<pre>Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg). </pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the barometric pressure and changes in a copper voltameter in series with the cell for producing the gas. The partial pressures of triethylamine were calculated on the assumption that equilibrium was established between triethylamine in solution	<pre>Aissolution of gas caused negligible ase.  Y INFORMATION  SOURCE AND PURITY OF MATERIALS:  I. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg).  ESTIMATED ERROR:  REFERENCES: I. Dreisbach, R.R. Physical Properties of Chemical Compounds, Vol. 2, A.C.S., Washington. <u>1959</u>. 2. Gaus, Z. Anorg. Chem. <u>1900</u>,</pre>	
ref. (1), on the assumption that a change of volume of the liquid phy AUXILIAN METHOD/APPARATUS/PROCEDURE: The partial pressures of triethyl- amine above solutions of concentrat- ions determined by titration, were measured by a dynamic method (refs. (2) & (3)). Mixtures of hydrogen an oxygen, produced by electrolysis of sodium hydroxide solution, were passed through each solution of triethylamine. The triethylamine in the gas stream was absorbed in hydrochloric acid and estimated from changes in electrical conductivity due to partial neutralisation of the acid. The volumes of hydrogen/ oxygen gas mixture produced by electrolysis were found from the barometric pressure and changes in a copper voltameter in series with the cell for producing the gas. The partial pressures of triethylamine were calculated on the assumption that equilibrium was established	<pre>Aissolution of gas caused negligible ase. Y INFORMATION SOURCE AND PURITY OF MATERIALS: 1. Hydrated chloride from Kahlbaum; reacted with KOH; gas dried with NaOH. 2. Kahlbaum n-Hexan aus Propyljodid; distilled over Na; b.p. 67.85-68.10°C (745 mmHg). ESTIMATED ERROR: REFERENCES: 1. Dreisbach, R.R. Physical Properties of Chemical Compounds, Vol. 2, A.C.S., Washington. <u>1959</u>.</pre>	

**Phosphine Solubilities** 

COMPONENTS:	EVALUATOR:
l. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Organic liquids.	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London N7 8DB United Kingdom. August 1983

## CRITICAL EVALUATION:

Data obtained by Palmer  $et \ al$  (1) and by Devyatykh  $et \ al$  (2) have been discussed in detail by Gerrard (3). Mole fraction solubilities calculated from measurements by Palmer  $et \ al$ . fall into a consistent pattern with a lower solubility in hydrogen bonded solvents compared with other solvents. There is also an increase in mole fraction solubility with increase in chain length in the case of straight chain alkanes. Solubilities are in the order:

in benzene < in cyclohexene < in cyclohexane

and

in benzene < in toluene < in xylene.

The variation of solubility in nitrobenzene, with change in temperature, was measured by both Palmer *et al.* and by Devyatykh *et al.* The ratio  $vol_{PH_3}/vol_{solvent}$  for a temperature of 295.2 K has been estimated by

the compiler from data given by Devyatykh *et al*. to be 8.4. This may be compared with the value of 3.06 given by Palmer *et al*. for a pressure of 1 atm. There is a similar discrepancy between the solubility in liquid paraffin calculated from the data of Devyatykh *et al* and that measured by Palmer.

There is also a marked difference between the solubility of phosphine in didecyl phthalate calculated from data given by Devyatykh and that in dibutyl phthalate measured by Palmer. Expressed as  $vol._{PH_3}/vol._{solvent}$ 

at 295.7 K the former gives 22.2 and the latter 3.23. If it could be assumed that Devyatykh's data could be extrapolated to a partial pressure of phosphine of 1 atm, the corresponding mole fraction solubility at 295.7 K for didecyl phthalate would be about 0.3 compared with the value of 0.0342 given by Palmer for dibutyl phthalate at this temperature.

Solubilities measured with conventional apparatus by Palmer *et al.* are likely to be reliable. Solubilities for a partial pressure of 1 atm calculated from distribution constants determined by gas chromatography by Devyatykh *et al.* are likely to be unreliable. They may, perhaps, be used to estimate relative solubilities in the solvents which were studied but such estimates may not be precise.

The solubility in cyclohexanol at 299.2 K was measured by Cauquil (4) using very simple apparatus. The mole fraction solubility at a partial pressure of 1 atm, calculated from the Ostwald coefficient reported by this author, is close to values for other polar solvents reported by Palmer *et al*. The value for cyclohexanol may therefore be accepted as a tentative value in the absence of other data for this solvent.

The solubility in trifluoroacetic acid was measured by Fujioka and Cady (5) who also used very simple apparatus. They calculated the Ostwald coefficient to be 15.9 from measurements at 653 mmHg and 299.2 K. This corresponds to a mole fraction solubility of 0.040 at this pressure and about 0.046 at 760 mmHg. These measurements are in sharp contrast to those of Palmer *et al.* who reported an Ostwald coefficient of 2.46 at 760 mmHg and 293.2 K for 95.3% trifluoroacetic acid and a value of 2.64 at 760 mmHg and 294.7 K for a 96.8% sample. Unfortunately the purity of the acid used by Fujioka and Cady was not stated and direct comparison of the two sets of work may not be justified.

(cont.)

COMPONENTS: l. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Organic liquids.	EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London N7 8DB United Kingdom. August 1983
CRITICAL EVALUATION:	
CALIFORE EVALUATION.	
References:	
1. Palmer, M. G.; Lessels, R.W.M.; Albright & Wilson (Mfg.) Ltd., T (Quoted by Gerrard, W. Gas Solub Pergamon Press, Oxford, <u>1980</u> .)	
2. Devyatykh, G. G.; Ezheleva, A. Zh. Neorgan. Khim. <u>1963</u> , 8, 1307 (Russ. J. Inorg. Chem. <u>1963</u> , 8,	7.
3. Gerrard, W. Solubility of Gases in Liquids,	Plenum Press, New York, <u>1976</u> .
4. Cauquil, G. J. Chim. Phys. Phys. Chim. Biol.	<u>1927</u> , 24, 53.
5. Fujioka, G.S.; Cady, G.H. J. Amer. Chem. Soc. <u>1957</u> , 79, 24	451.

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COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; 2. Alkanes	[7803-51-2]	Childs, A. F.; Albright & Wilso Technical Note N Ouoted by Gerrar	Lessels, R. W. M.; McCoubrey, J. C. n (Mfg.) Ltd., to. 60, <u>1963</u> . cd, W., "Gas Solu- pread Applications",
VARIABLES:		PREPARED BY: P. G	. T. Fogg
EXPERIMENTAL VALUES:			
Solvent	т/к	Mole fraction $x_{\rm PH_3}$ (l atm)	Ostwald Coefficient, L
Pentane; $C_5H_{12}$ ; [109-66-0]	294.65	0.0200	4.33
Hexane; $C_6H_{14}$ ; [110-54-3]	294.65	0.0354	6.79
Heptane; C <sub>7</sub> H <sub>16</sub> ; [142-82-5]	294.65	0.0413	7.12
2,2,4-Trimethylpenta C <sub>8</sub> H <sub>18</sub> ; [540-84-1	ne; 294.4 ]	0.0400	6.19
Decane; $C_{10}H_{22}$ ; [124-18-5]	294.05	0.0432	5.73
Dodecane; C <sub>12</sub> H <sub>26</sub> ; [112-40-3]	293.15	0.0469	5.35
pressure (unspec.	ified) and solub:	l pressure equal t ility values were of 101.325 kPa (1	adjusted to
	AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE	:	SOURCE AND PURITY OF	MATERIALS:
Gas saturated with so was passed into a gla vessel connected to a A measured volume of introduced into the stirred with a magner measured volume of ga from a gas burette to total pressure in the vessel to its origin was apparently equal pressure. The proce	ass absorption a gas burette. liquid was vessel and tic stirrer. A as was added o restore the e absorption al value which	acid; contai as impurity; H <sub>3</sub> PO <sub>4</sub> and wit 2. C <sub>5</sub> H <sub>12</sub> ; C <sub>6</sub> H <sub>14</sub> pure material Petroleum LtC technical gra by distillati	<pre>d dilute phosphoric .ned 2.5% hydrogen dried with conc. ch P<sub>2</sub>O<sub>5</sub>. ; C<sub>7</sub>H<sub>16</sub>; C<sub>8</sub>H<sub>18</sub>: .s supplied by Esso d; C<sub>10</sub>H<sub>22</sub>; C<sub>12</sub>H<sub>26</sub>: ade samples purified</pre>
peated several times value of the solubil: The apparatus was shi draughts and measured room temperature.	and the mean ity was taken. ielded from	ESTIMATED ERROR:	
In calculating the set the gas, account was a partial vapor pressure solvent and the part of hydrogen present a in the phosphine.	taken of the re of the ial pressure	REFERENCES :	

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. 2,6-Dimethyl-2-heptane; C <sub>9</sub> H <sub>18</sub> ; [5557-98-2] VARIABLES:	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford. PREPARED BY:	
	P. G. T. Fogg	
EXPERIMENTAL VALUES:		
T/K Ostwald Coefficient, L		
293.65 5.87		
Measurements were made at a total pressure equal to barometric pressure (unspecified) and solubility values were adjusted to a partial pressure of phosphine of 101.325 kPa (l atm) using Henry's law.		
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re-	<ol> <li>Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>.</li> <li>G.P.R. grade, distilled under reduced pressure (ca. 17 mmHg), to remove dissolved gases.</li> </ol>	
peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature.	ESTIMATED ERROR:	
In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	REFERENCES:	

ويستجمع ويبيب ومستخفي كالتعامي والمتعادين والمتعاد والمتعاد والمتعاد والتعادي والتعاد والتعاد والمتعاد والمتعاد	
COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Alicyclic compounds	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	
Solvent	T/K Mole Ostwald T/K fraction Coefficient, $x^{PH_3}$ (1 atm) L
Cyclohexene; $C_{6}H_{10}$ ; [110-83-8]	294.15 0.0280 6.85
Cyclohexane; $C_{6}H_{12}$ ; [110-82-7]	291.65 0.0326 7.47
Undecafluoro(trifluoromethyl)-	294.95
cyclohexane; $C_7F_{14}$ ; [355-02-2]	2)4.90 T.9T
1,2,3,4-Tetrahydronaphthalene; $C_{10}H_{12}$ ; [119-64-2]	295.25 0.0291 5.34
2,6,6-Trimethylbicyclo[3.1.1]- hept-2-ene,(α-pinene); C <sub>10</sub> H <sub>16</sub> ; [80-56-8]	292.65 19.5
Decahydronaphthalene; C <sub>10</sub> H <sub>18</sub> ; [91-17-8]	295.35 0.0316 5.05
pressure (unspecified) and solub a partial pressure of phosphine Henry's law.	of 101.325 kPa (1 atm) using
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of	<ol> <li>Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>.</li> <li>Cyclohexene Technical grade, purified by dis- tillation. Other solvents "Analar" or G.P.R. grade, dis- tilled under reduced pressure (ca. 17 mmHg) to remove dis- solved gases.</li> <li>ESTIMATED ERROR:</li> </ol>
the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Aromatic compounds	Palmer Childs <i>Albrig</i> <i>Techni</i> Quoted <i>biliti</i>	MEASUREMENTS: , M. G.; Lessel , A. F.; McCoul ht & Wilson (Mfg cal Note No. 60) by Gerrard, W. es - Widespread Pergamon Press,	prey, J. C. g.) Ltd., , <u>1963</u> . , "Gas Solu- Applications",
VARIABLES:	PREPARED	BY: P. G. T. Fo	ogg
EXPERIMENTAL VALUES:		· · · · · · · · · · · · · · · · · · ·	
Solvent	т/К	Mole fraction $x_{\rm PH_3}$ (1 atm)	Ostwald Coefficient, L
Benzene; C <sub>6</sub> H <sub>6</sub> ; [71-43-2]	295.15	0.0260	7.26
Benzenamine; C <sub>6</sub> H <sub>7</sub> N; [62-53-3]	295.15	0.0105	2.80
Dimethylbenzene; C <sub>6</sub> H <sub>10</sub> ; [1330-20-7]	294.65		6.52
<pre>(1-Methylethyl)benzene; C<sub>9</sub>H<sub>12</sub>;     [98-82-8]</pre>	294.65	0.0316	5.68
<pre>l,2-Benzenedicarboxylic acid, dibutyl ester; C16H22O4; [119-64-2]</pre>	295.65	0.0342	3.23
Hexafluorobenzene 98.5%; C <sub>6</sub> F <sub>6</sub> ; [392-56-3]	295.4		4.36
Henry's law.			
AUXILIARY	INFORMAT	ION	
METHOD/APPARATUS/PROCEDURE:	SOURCE A	ND PURITY OF MATER	IALS:
Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of the gas, account was taken of the	pho aci as H <sub>3</sub> P 2. C <sub>6</sub> H G.P duc rem C <sub>1</sub> s	ed pressure (ca. ove dissolved ga H <sub>22</sub> O <sub>4</sub> : technica <u>d by distillatic</u> D ERROR:	te phosphoric 5% hydrogen 1 with conc. 5. "Analar" or cilled under re- 17 mmHg) to ases; C9H12; al grade, puri-
partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.			

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Methylbenzene; C <sub>7</sub> H <sub>8</sub> ; [108-88-3] VARIABLES:	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford. PREPARED BY: P. G. T. Fogg
T/K Mole fraction $x_{\rm PH_3}$ (1 atm)	Ostwald Coefficient, L
293.85       0.0290         295.15       0.0304         313.4       0.0194         334.95       0.0129	- 7.15 -
Measurements were made at a total pressure (unspecified) and solubi a partial pressure of phosphine o Henry's law.	lity values were adjusted to
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts for measurements at room temperature (293.85 K). Tempera- tures were thermostatically control- led for other measurements. In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H <sub>3</sub> PO <sub>4</sub> and with P <sub>2</sub> O <sub>5</sub> . ESTIMATED ERROR: REFERENCES:

COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Phosphine; PH3; [7803-51-2]	Cauquil, G.	
<pre>2. Cyclohexanol; C<sub>6</sub>H<sub>12</sub>O; [108-93-0]</pre>	J. Chim. Phys. Phys. Chim. Biol. <u>1927</u> , 24, 53 <b>-</b> 55.	
VARIABLES:	PREPARED BY: P. G. T. Fogg	
EXPERIMENTAL VALUES:	· · · · · · · · · · · · · · · · · · ·	
T/K P <sub>PH3</sub> /mmHg Co	Ostwald Mole fraction* Defficient, $x_{PH_3}$ (1 atm.)	
299.2 766	2.856 0.01226	
760 mmHg = 1 atm = $1.013 \times 10^5$ Pa. * Value of $x_{\rm PH_3}$ (1 atm) has been calculated by the compiler using densities of cyclohexanol at 293.2 K and 303.2 K given in refs. (1) and (2), respectively, and values of van der Waals constants for phosphine given in ref. (1).		
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
A measured volume of cyclohexanol was put into contact with a measured volume of phosphine in a graduated tube over mercury. The final volume of gas and the temperature and pressure were measured when equilibrium had been reached. The author considered	2. All dissolved air was removed by boiling; b.p. 334.1 K (766 mmHg).	
that no allowance for the vapor	ESTIMATED ERROR:	
pressure of cyclohexanol at the		
temperature of measurement was		
necessary.	<ul> <li>REFERENCES:</li> <li>1. Handbook of Chemistry and Physics, (61st edition), C.R.C. Press, Cleveland, Ohio, <u>1980</u>.</li> <li>2. Timmermans, J. Physico-Chemical Constants of Pure Organic Com- pounds, Vol. II, Elsevier, London, <u>1965</u>.</li> </ul>	

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COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Petroleum ethers and liquid paraffin	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	
Solvent T/K	Ostwald Coefficient, L
Liquid paraffin 292.35 40/60 Petroleum ether 292.15 60/80 " " 292.15 80/100 " " 296.15 100/120 " " 295.65 120/160 " " 293.9	4.86 4.36 8.02 6.42 6.15 6.14
Measurements were made at a total pressure (unspecified) and solub a partial pressure of phosphine of Henry's law.	ility values were adjusted to
AUXILIARY	INFORMATION
ME THOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature.	<ol> <li>Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>.</li> <li>Solvents were "Analar" or G.P.R. grade; distilled under reduced pressure (ca. 17 mmHg) to remove dissolved gases.</li> <li>ESTIMATED ERROR:</li> </ol>
In calculating the solubility of the gas, account was taken of the partial vapor pressure of the sol- vent and the partial pressure of hydrogen present as an impurity in the phosphine.	REFERENCES :

	ORIGINAL M	EASUREMENTS:	
<ol> <li>Phosphine; PH<sub>3</sub>; [7803-51-2]</li> <li>Aliphatic compounds containing oxygen.</li> </ol>	Childs, Albrigh Technica Quoted I bilitiea	M. G.; Lessel A. F.; McCoub t & Wilson (Mfg al Note No. 60, by Gerrard, W., s - Widespread ergamon Press,	prey, J. C. .) Ltd., <u>1963</u> . "Gas Solu- Applications",
VARIABLES:	PREPARED E	Y: Р. G. T.	Fogg
EXPERIMENTAL VALUES:		· · · · · · · · · · · · · · · · · · ·	
Solvent	т/к	Mole fraction $x_{\rm PH_3}$ (1 atm)	Ostwald Coefficient, L
Trifluoroacetic acid 95.3%; C <sub>2</sub> HF <sub>3</sub> O; [76-05-1]	293.15	, <u>, , , , , , , , , , , , , , , ,</u>	2.46
Trifluoroacetic acid 96.8%; C2HF3O; [76-05-1]	294.65		2.64
Acetic acid; $C_2H_4O_2$ ; [64-19-7]	294.15	0.0075	3.19
1,2-Ethanediol; C <sub>2</sub> H <sub>6</sub> O <sub>2</sub> ; [107-21-1]	292.35	0.0033	1.45
2-Propanone; C <sub>3</sub> H <sub>6</sub> O; [67-64-1]	295.55	0.0132	4.45
1,2-Epoxypropene <sup>*</sup> ; C₃H <sub>6</sub> O; [75-56-9]	295.95	0.0088	3.06
Nitropropane <sup>*</sup> ; C <sub>3</sub> H <sub>7</sub> NO <sub>2</sub> ; [25322-01-4]	294.4	0.0157	4.26
3-oxo-butanoic acid, ethyl ester; C <sub>6</sub> H <sub>10</sub> O <sub>3</sub> ; [141-97-9]	294.95	0.0114	2.23
Measurements were made at a total pressure (unspecified) and solubi	lity valu	ues were adjust	ed to
Measurements were made at a total pressure (unspecified) and solubi a partial pressure of phosphine o Henry's law.	lity valu	ues were adjust	ed to
pressure (unspecified) and solubi a partial pressure of phosphine o	lity valu f 101.32	ues were adjust 5 kPa (1 atm) v	ed to
pressure (unspecified) and solubi a partial pressure of phosphine o Henry's law.	lity valu f 101.32	ues were adjust 5 kPa (1 atm) v	ed to sing
pressure (unspecified) and solubi a partial pressure of phosphine o Henry's law. AUXILIARY	<pre>lity valu f 101.32 INFORMATIO SOURCE AND 1. Prepa acid as in H<sub>3</sub>PO 2. Compo tech dist: were dist:</pre>	N PURITY OF MATERI Ared from zinc phorus and dilus; contained 2. mpurity; dried , and with P <sub>2</sub> O <sub>5</sub> bunds marked wi hical grade and illation. Oth "Analar" or G. illed under red 17 mmHg) to re	ALS: amalgam, te phosphoric 5% hydrogen with conc. th * were purified by er solvents P.R. grade uced pressure

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Tetrahydrofuran; C₄H <sub>8</sub> O; [109-99-9]	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford.
VARIABLES:	PREPARED BY:
	P. G. T. Fogg
EXPERIMENTAL VALUES:	
T/K Mole fraction <sup>x</sup> PH <sub>3</sub> (1 atm)	Ostwald Coefficient, L
295.15 0.0245	7.49
Measurements were made at a total pressure (unspecified) and solubil a partial pressure of phosphine of Henry's law.	ity values were adjusted to 101.325 kPa (1 atm) using
	INFORMATION _
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam,    phosphorus and dilute phosphoric    acid; contained 2.5% hydrogen    as impurity; dried with conc.    H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>. 2. "Analar" or G.P.R. grade,    distilled under reduced pressure    (ca. 17 mmHg) to remove dis-    solved gases. ESTIMATED ERROR: REFERENCES: REFERENCES:</pre>

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Nitrobenzene; C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ;	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963.
[98-95-3]	Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", <u>1980</u> , Pergamon Press, Oxford.
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	
T/K Mole fraction $x_{\rm PH_3}$ (1 atm)	Ostwald Coefficient, L
293.65       0.0139         295.65       0.0127         313.25       0.0100	- 3.06 -
Measurements were made at a total pressure (unspecified) and solubi a partial pressure of phosphine o Henry's law.	lity values were adjusted to
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re-	SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H <sub>3</sub> PO <sub>4</sub> and with P <sub>2</sub> O <sub>5</sub> .
peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts for measurements at room temperature (293.65 K). Tempera- tures were thermostatically con- trolled for other measurements.	ESTIMATED ERROR: REFERENCES:
In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	

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<pre>COMPONENTS: 1. Phosphine; PH<sub>3</sub>; [7803-51-2] 2. Dinonylamine, (N-nonyl-1-nonan- amine); C<sub>10</sub>H<sub>39</sub>N; [2044-21-5] VARIABLES:</pre>	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications" <u>1980</u> , Pergamon Press, Oxford. PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	
Mole fractio T/K <sup>x</sup> PH <sub>3</sub> (l at	
294.4 0.0593	4.55
Measurements were made at a tota pressure (unspecified) and solub a partial pressure of phosphine Henry's law.	ility values were adjusted to
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam,    phosphorus and dilute phosphoric    acid; contained 2.5% hydrogen    as impurity; dried with conc.    H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>. 2. Technical grade purified by    distillation.  ESTIMATED ERROR: REFERENCES: REFERENCES:</pre>
	I

294 Phosphine Solubilities		
<pre>COMPONENTS: 1. Phosphine; PH<sub>3</sub>; [7803-51-2] 2. Tetrachloromethane; CCl<sub>4</sub>;    [56-23-5]    or    1,2-Dichloroethane; C<sub>2</sub>H<sub>4</sub>Cl<sub>2</sub>;    [107-06-2] VARIABLES:</pre>	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications" 1980, Pergamon Press, Oxford. PREPARED BY:	
	P. G. T. Fogg	
EXPERIMENTAL VALUES:		
Solvent T/K	Mole fraction Ostwald $x_{PH_3}$ (1 atm) Coefficient, L	
Tetrachloromethane 293.65	0.0165 4.19	
1,2-Dichloroethane 294.4	0.0176 5.48	
	INFORMATION	
	••••••••••••••••••••••••••••••••••••••	
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	<pre>SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam,    phosphorus and dilute phosphoric    acid; contained 2.5% hydrogen    as impurity; dried with conc.    H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>. 2. Solvents were "Analar" or G.P.R.    grade; distilled under reduced    pressure (ca. 17 mmHg) to remove    dissolved gases. ESTIMATED ERROR: REFERENCES: REFERENCES:</pre>	

COMPONENTS: 1. Phosphine; PH <sub>3</sub> ; [7803-51-2] 2. Carbon disulfide; CS <sub>2</sub> ; [75-15-0]	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford.
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	L
T/K Mole fraction $x_{\rm PH_3}$ (l atm)	Ostwald Coefficient, L
294.15 0.0250	10.25
Measurements were made at a tota pressure (unspecified) and solub a partial pressure of phosphine o Henry's law.	ility values were adjusted to
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean	<ol> <li>Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H<sub>3</sub>PO<sub>4</sub> and with P<sub>2</sub>O<sub>5</sub>.</li> <li>No details given.</li> </ol>
value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature.	
In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	REFERENCES:

•	Solubilities
COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>Phosphine; PH<sub>3</sub>; [7803-51-2]</li> <li>Various Liquids.</li> </ol>	Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.
2. Various Liquius.	Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682.
VARIABLES: Temperature	PREPARED BY: P.G.T. Fogg.
EXPERIMENTAL VALUES:	
	ribution constant Heat of solution PH <sub>3</sub> /vol <sub>solvent</sub> /kcal mol <sup>-1</sup>
2-Furancarboxaldehyde, C <sub>5</sub> H <sub>4</sub> O <sub>2</sub> ; [98-01-1]	11.8 -3.4
l,2-Benzenedicarboxylic acid, didecyl ester, C <sub>28</sub> H <sub>46</sub> O <sub>4</sub> ; [84-77-5]	23.5 -4.0
Triethoxysilane, C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	12.2 -5.4
Silicic acid, tetraethyl ester, C <sub>8</sub> H <sub>20</sub> O <sub>4</sub> Si; [78-10-4]	12.45 -5.0
Silicone 702-DF	15.3 -3.6
Silicone VKZh-94B	25.3 -6.0
Temperature = 293.2 K. Distribution constants were measured	between 278.2 K and 323.2 K. The
partial pressures of phosphine at whi not stated. The total pressure of ph 760 mmHg. in each case. Distribution	ch these measurements were made were osphine and carrier gas was about
AUXILIARY	INFORMATION
METHOD / APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain.	<ol> <li>Prepared from phosphorus and aqueous alkali; purified by vacuum distillation; no impurities detected by chromatography.</li> <li>H<sub>2</sub> &amp; N<sub>2</sub>: passed through activated carbon and through molecular sieve.</li> </ol>
The free volume, V <sub>g</sub> , was equated with the retention volume for hydrog- en gas. The distribution constant, <i>K</i> , was calculated from the James and Martin equation.	ESTIMATED ERROR:
$v_{R} = v_{q} + kv_{1}$	
where V <sub>R</sub> is the retention volume for phosphine.	REFERENCES :

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Phosphine; PH3; [7803-51-2]	Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.
2. Various liquids	Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682.

## EXPERIMENTAL VALUES:

temperature only but heats of solution, said to have been calculated from the variation of distribution constants with temperature, were given.

If it is assumed that distribution constants vary with temperature according to equations of the form :

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution of phosphine in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form :

 $K = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	B/K
2-Furancarboxaldehyde	-3.371	1712
<pre>l,2-Benzenedicarboxylic acid, didecyl ester</pre>	-3.712	2014
Triethoxysilane	-6.772	2719
Silicic acid, tetraethyl ester	-6.065	2518
Silicone 702-DF	-3.455	1813
Silicone VKZh-94B	-7.073	3021

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of phosphine at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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296 Phosphine Solubilities				
COMPONENTS :		ORIGINAL MEASUREMENTS:		
<ol> <li>Phosphine; PH<sub>3</sub>; [7803-51-2]</li> <li>Various liquids</li> </ol>		Devyatykh, G.G.; Ezheleva, A.E. Zorin, A.D.; Zueva, M.V. Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682.		
VARIABLES:		PREPARED BY:		
Temperature, pressure		P.G.T. Fogg.		
EXPERIMENTAL VALUES:				
Solvent	Pressure range /mmHg	Distribution constant vol <sub>PH3</sub> /vol <sub>solvent</sub>	Heat of solution /kcal mol <sup>-1</sup>	
2-Ethoxyethanol, C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> ; [110-80-5]	0.3-25.0	9.4	-0.95	
l,l <sup>-</sup> -oxybis [2-chloro- ethane]; C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub> O; [lll-44-4]	0.05-19.0	20.0	-2.2	
Nitrobenzene, C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ; [98-95-3]	0.02-18.0	8.59	-1.56	
Liquid paraffin	0.1 -43.0	15.9	-3.0	
Silicone PFMS-4F	0.03-23.0	16.5	-2.3	
Temperature = 293.2K	760  mmHg =	$1 \text{ atm} = 1.013 \times 10^5 \text{ Pa}$		
Distribution constants were measured range of partial pressures of phosphi mmHg. At a fixed temperature the dis from the mean values by more than ±3% one temperature only but heats of sol from the variation of distribution co If it is assumed that distribution co ing to equations of the form :		ne and a total pressure tribution constants did . These mean values wer ution, said to have been nstants with temperature	of about 760 not depart re reported at n calculated e, were given.	
	AUXILIARY	INFORMATION		
METHOD/APPARATUS/PROCEDURE:	<u> </u>	SOURCE AND PURITY OF MATERIA	ALS:	
A chromatographic method wa Temperatures were controlle $\pm$ 0.5 K. The support phase of Nichrome spirals. The c gas was either nitrogen or The volume, V <sub>1</sub> , of the liqu was calculated from the wei column before and after fil liquid and allowing to drai free volume, V <sub>g</sub> , was equate retention volume for hydrog	d to consisted arrier hydrogen. id phase ght of the ling with n. The d with the	<ol> <li>Prepared from phos aqueous alkali; pu vacuum distillatio impurities detecte ography.</li> <li>H<sub>2</sub> and N<sub>2</sub>: passed t ed carbon and thro sieve.</li> </ol>	rified by n; no d by chromat- hrough activat-	
The distribution constant, calculated from the James a equation.	K, was	ESTIMATED ERROR:		
$V_{R} = V_{g} + KV_{l}$				
where $V_R$ is the retention v phosphine.	olume for	REFERENCES:		

COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>Phosphine; PH<sub>3</sub>; [7803-51-2]</li> <li>Various liquids.</li> </ol>	Devyatykh, G.G.; Ezheleva, A.E. Zorin, A.D.; Zueva, M.V.
	Russ, J. Inorg. Chem. <u>1963</u> ,8, 678-682.

EXPERIMENTAL VALUES:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution of phosphine in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $K = \exp [A + (B/T)]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	B/K
2-Ethoxyethanol	0.609	478
1,1'-oxybis [2-chloroethane]	-0.782	1108
Nitrobenzene	-0.528	785
Liquid paraffin	-2.386	1511
Silicone PFMS-4F	-1.147	1158

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of phosphine at the stationary phasecarrier gas interface may have lowered the accurary of the results.

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<pre>COMPONENTS:     1. Phosphine; PH<sub>3</sub>; [7803-51-2]     2. Carbon disulfide; CS<sub>2</sub>;     [75-15-0]     3. Phosphorus; P<sub>4</sub>; [7723-14-0]     VARIABLES:     EXPERIMENTAL VALUES:</pre>	ORIGINAL MEASUREMENTS: Palmer, M. G.; Lessels, R. W. M.; Childs, A. F.; McCoubrey, J. C. Albright & Wilson (Mfg.) Ltd., Technical Note No. 60, 1963. Quoted by Gerrard, W., "Gas Solu- bilities - Widespread Applications", 1980, Pergamon Press, Oxford. PREPARED BY: P. G. T. Fogg
T/K Percentage by weight Pe of CS <sub>2</sub>	ercentage by weight Coefficient, of P <sub>4</sub> L
294.15 88.69	11.31 6.25
Measurements were made at a tota pressure (unspecified) and solub a partial pressure of phosphine Henry's law.	ility values were adjusted to
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE: Gas saturated with solvent vapor was passed into a glass absorption vessel connected to a gas burette. A measured volume of liquid was introduced into the vessel and stirred with a magnetic stirrer. A measured volume of gas was added from a gas burette to restore the total pressure in the absorption vessel to its original value which was apparently equal to barometric pressure. The procedure was re- peated several times and the mean value of the solubility was taken. The apparatus was shielded from draughts and measurements made at room temperature. In calculating the solubility of the gas, account was taken of the partial vapor pressure of the solvent and the partial pressure of hydrogen present as an impurity in the phosphine.	SOURCE AND PURITY OF MATERIALS: 1. Prepared from zinc amalgam, phosphorus and dilute phosphoric acid; contained 2.5% hydrogen as impurity; dried with conc. H <sub>3</sub> PO <sub>4</sub> and with P <sub>2</sub> O <sub>5</sub> . ESTIMATED ERROR: REFERENCES:

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Phosphine; PH<sub>3</sub>; [7803-51-2] 2. Trifluoroacetic acid; C<sub>2</sub>HF<sub>3</sub>O<sub>2</sub>;</pre>	Fujioka, G. S.; Cady, G. H. J. Amer. Chem. Soc.
	<u>1957</u> , <i>79</i> , 2451-2454.
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	······································
T/K <sup>p</sup> PH3 <sup>/mmHg</sup> Ostwald	Coefficient Mole fraction* L $x^{p_{H_3}}$
299.2 653	15.9 0.040
760 mmHg = 1 atm 1 atm = 1.013 x $10^5$ Pa	
* Calculated by the compiler using that 25°C given in ref. (1).	he density of trifluoroacetic acid
AUXILIARY	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
This solubility measurement was carried out during investigations of inorganic reactions in anhydrous trifluoroacetic acid. Phosphine was confined over mercury in a gas measuring tube and a measured sample of trifluoroacetic acid was added above the mercury by a hypodermic syringe. The apparatus was shaken for several hours until the new volume of gas was constant. The	<ol> <li>No details given.</li> <li>Supplied by Minnesota Mining and Manufacturing Co. and used without further purification.</li> </ol>
amount of gas absorbed was calculated from the change in volume of the gas phase. In the calculation of the partial pressure of phosphine the total pressure was corrected to allow for the partial pressure of	ESTIMATED ERROR:
trifluoroacetic acid but details of the correction were not given.	REFERENCES: 1. Encyclopedia of Chemical Technology, 3rd ed. Vol. 10, Wiley, New York, <u>1980</u> .

**Arsine Solubilities** 

COMPONENTS: l. Arsine; AsH3; [7784-42-1] 2. Organic liquids	EVALUATOR: P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, N7 8DB, UNITED KINGDOM.
	August 1983

CRITICAL EVALUATION:

The data published by Devyatykh *et al*. (1) and those published by Corriez and Berton (2) have been discussed in detail by Gerrard (3). The data of Devyatykh *et al*. (1) were determined using a gas chromatographic technique. The solubility refers to that at a very low pressure of arsine and it is unlikely that extrapolation to one atmosphere pressure is valid. In addition, possible adsorption at the stationary phase-carrier gas interface could have occurred and the results should be viewed with caution. It is unwise to use the data given by Devyatykh to predict gas solubilities at 1 atmosphere pressure. The data may, perhaps, be used to estimate relative solubilities in the solvents which were studied but such estimates may not be very percise.

Solubilities measured by Corriez and Berton are consistent with the properties of the solvents which were studied and may be accepted as provisional values.

## References

- Devyatykh, G. G.; Ezheleva, A. E.; Zorin, A. D.; Zueva, M. V. Zh. Neorgan. Khim. <u>1963</u>, 8, 1307 (Russ. J. Inorg. Chem. <u>1963</u>, 8, 678).
- Corriez, P.; Berton, A. Bull. Soc. Chim. France <u>1950</u>, 43.
- Gerrard, W.
   Gas Solubilities Widespread Applications, Pergamon Press, Oxford, <u>1980</u>.

COMPONENTS:	ORIGINAL N	ÆASUREMENTS:	
l. Arsine; AsH <sub>3</sub> ; [7784-42-1]	Corriez, P.; Berton, A.		
<ol> <li>Hydrogen cyanide and aliphatic nitriles.</li> </ol>	Bull. Soc. Chim. France 1950, 43-45.		
VARIABLES:	PREPARED BY:		
	P. G. T. Fogg		
EXPERIMENTAL VALUES:		· · · · · · · · · · · · · · · · · · ·	
Solvent	т/к	Bunsen coefficient «	Mole fraction <sup>;</sup> <sup>x</sup> AsH <sub>3</sub> (1 atm)
Hydrocyanic acid; HCN; [74-90-8]	287.2	0.7	0.0012
Acetonitrile; C <sub>2</sub> H <sub>3</sub> N; [75-05-8]	287.2	5.3	0.0122
Propanenitrile (propionitrile); C <sub>3</sub> H <sub>5</sub> N; [107-12-0]	287.2	7.9	0.0242
Butanenitrile (butyronitrile); C <sub>4</sub> H <sub>7</sub> N; [109-74-0]	287.2	8.0	0.0302
* Calculated by compiler using the de the densities of solvents given in	ensity of refs. (2)	arsine given i and (3).	n ref. (1) and
the densities of solvents given in	ensity of refs. (2) INFORMATIO	and (3).	n ref. (1) and
the densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE:	refs. (2) INFORMATIO	and (3).	
the densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured	refs. (2) INFORMATIO	and (3).	IALS;
the densities of solvents given in	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
The densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed into an absorption pipette containing	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
The densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed into an absorption pipette containing a known volume of liquid S. The	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
The densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed into an absorption pipette containing a known volume of liquid S. The final volume of gas was measured at	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;
The densities of solvents given in AUXILIARY METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed into an absorption pipette containing	refs. (2) INFORMATIO SOURCE AND No inf	and (3). N D PURITY OF MATER	IALS;

COMPONENTS :		ORIGINAL MEASUREMENTS:	
		DRIGINAL MEASUREMENTS: Devyatykh, G.G.; Ezheleva, A.E.;	
1. Arsine; AsH <sub>3</sub> ; [7784-42-1]		Devyatykn, G.G.; Ezneleva, A.E.; Zorin, A.D.; Zueva, M.V.	
2. Various liquids		Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682.	
VARIABLES:		PREPARED BY:	
Temperature, press	ıre	P.G.T. Fog	là
EXPERIMENTAL VALUES:	<u></u>		
Solvent	Pressure I range /mmHg	Distribution constant vol <sub>AsH3</sub> /vol <sub>solvent</sub>	Heat of solution /kcal mol <sup>-1</sup>
2-Ethoxyethanol, C4H10O2; [110-80-5]	0.2 - 23.4	16.5	-0.98
l,l'-oxybis [2-chloro- ethane], C&H&Cl2O [111-44-4]	0.05- 13.4	22.4	-2.5
Nitrobenzene, C <sub>5</sub> H <sub>5</sub> NO <sub>2</sub> ; [98-95-3]	0.01- 17.0	11.72	-1.80
Liquid paraffin	0.2 - 26.5	22.7	-3.5
Silicone PFMS-4F	0.02- 17.5	31.4	-3.2
Temperature = 293.2 K	760  mmHg = 1	$atm = 1.013 \times 10^5 Pa.$	
a range of partial press 760 mmHg. At a fixed ter depart from the mean value reported at one temperature been calculated from the temperature, were given. vary with temperature acc	nperature the les by more t lre only but variation of If it is as	e distribution constant than ±3%. These mean v heats of solution, sai distribution constant sumed that distributio	s did not alues were d to have s with
	AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCEDURE :		SOURCE AND PURITY OF MATER	IALS;
A chromatographic method was used. Temperatures were controlled to $\pm$ 0.5K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K,		<ol> <li>Prepared by react Zn<sub>3</sub>As<sub>2</sub> and aqueou purified by vacuu no impurities det chromatography.</li> <li>H<sub>2</sub> &amp; N<sub>2</sub> : passed activated carbon</li> </ol>	s acid; m distillation; ected by through
		molecular sieve.	
was calculated from the C Martin equation:	Tames and	ESTIMATED ERROR:	
$v_{R} = v_{g} + Kv_{1}$			
where V <sub>R</sub> is the retention for arsine.	n volume	REFERENCES:	
		L	

COMPONENTS:

1. Arsine; AsH ; [7784-42-1]

2. Various liquids

ORIGINAL MEASUREMENTS:

Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.

Russ, J. Inorg. Chem. <u>1963</u>, 8, 678-682.

EXPERIMENTAL VALUES:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature  $T, \Delta H$  is the heat of solution of arsine in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form.

 $K = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	В/К
2-Ethoxyethanol	1.120	493
1,1'-oxybis [2-chloroethane]	-1.184	1259
Nitrobenzene	-0.630	906
Liquid paraffin	-2.888	1762
Silicone PFMS-4F	-2.049	1611

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of arsine at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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306 Arsine S	olubilities
COMPONENTS:	ORIGINAL MEASUREMENTS:
<ol> <li>Arsine, AsH<sub>3</sub>; [7784-42-1]</li> <li>Various liquids</li> </ol>	Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V. <i>Russ. J. Inorg. Chem.</i> <u>1963</u> ,8, 678-682.
VARIABLES: Temperature	PREPARED BY: P.G.T. Fogg
EXPERIMENTAL VALUES:	L
Solvent	Distribution constant Heat of vol <sub>AsH3</sub> /vol <sub>solvent</sub> /kcal mol <sup>-1</sup>
2-Furancarboxaldehyde; C5H4O2; [98-01-1]	15.68 -3.6
l,2-Benzenedicarboxylic acid, didecyl ester; C <sub>20</sub> H46O4; [84-77-5]	31.8 -3.0
Triethoxysilane, C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	19.7 -5.8
Silicic acid, tetraethyl ester, $C_8H_{20}O_4Si$ ; [78-10-4]	17.0 -4.3
Silicone 702-DF	38.0 -4.7
Silicone VKZh-94B	26.2 -5.6
Temperature = 293.2 K	
and carrier gas was about 760 mmHg i	these measurements were made were small. The total pressure of arsine n each case. Distribution constants y but heats of solution, said to have
AUXILIARY	INFORMATION
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:
A chromatographic method was used. Temperatures were controlled to $\pm$ 0.5 K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and	no impurities detected by chromatography. H <sub>2</sub> & N <sub>2</sub> : passed through activated carbon and through molecular sieve.
Martin equation : $V_R = V_g + KV_1$ where $V_R$ is the retention volume for	PEFEDENCES.
arsine.	REFERENCES:

COMPONENTS:

1. Arsine, AsH<sub>3</sub>; [7784-42-1]

2. Various liquids

ORIGINAL MEASUREMENTS:

Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.

Russ. J. Inorg. Chem. <u>1963</u>,8, 678-682.

EXPERIMENTAL VALUES:

temperature, were given.

If it is assumed that distribution constants vary with temperature according to equations of the form :

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution of arsine in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $\mathcal{K} = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	B/K
2-Furancarboxaldehyde	-3.430	1813
1,2-Benzenedicarboxylic acid, didecyl		
ester	-1.693	1511
Triethoxysilane	-6.980	2920
Silicic acid, tetraethyl ester	-4.551	2165
Silicone 702-DF	-4.434	2367
Silicone VKZh-94B	-6.351	2820

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of the arsine at the stationary phasecarrier gas interface may have lowered the accuracy of the results. Arsine Solubilities

308 Arsine Sc	lubilities		
COMPONENTS :	ORIGINAL MEASUREMENTS:		
l. Arsine; AsH <sub>3</sub> ; [7784-42-1] 2. Various liquids.	Corriez, P.; Berton, A. Bull. Soc. Chim. France, 1950, 43-45.		
VARIABLES:	PREPARED BY: P. G. T. Fogg		
EXPERIMENTAL VALUES:			
Solvent	Bunson Mole fr T/K coefficient $x_{ m ASH}_3$	action* 1 atm)	
Huile de vaseline (liquid paraffin)	290.2 8 -		
2-Propanone (acetone); C <sub>3</sub> H <sub>6</sub> O; [67-64-1]	298.2 9.3 0.03	0	
Tetrahydronaphthalene (tetralin). C <sub>10</sub> H <sub>22</sub> ; [119-64-2]	298.2 10 0.06	2	
2-Aminoethanol (monoethanolamine); C <sub>2</sub> H <sub>7</sub> NO; [141-43-5]	285.2 1.75 0.00	47	
2,2',2"-Nitrilotris-ethanol (triethanolamine); C <sub>6</sub> H <sub>15</sub> NO <sub>3</sub> ; [102-71-6]	285.2 0.8 0.00	47	
* Calculated by the compiler using th and the densities of solvents given		ref. (1)	
AUXILIARY	INFORMATION		
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:		
The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0°C and l atm by the relation PV = RT. Gas was passed into an absorption pipette containing a known volume of solvent. The final volume of gas was measured at the barometric pressure, $p_{total}$ . The final pressure of arsine, $p_{ASH_2}$ was taken to be $p_{total}$ minus	<ol> <li>Acetone was 'pure' grade Tetralin, monoethanolami triethanolamine were 'te grades.</li> </ol>	ne, and	
rAsH <sub>3</sub> was taken to be ptotal minus the vapor pressure of the pure solvent. The final volume of gas was adjusted from $p_{ASH_3}$ to 1 atm and 0°C. The Bunsen absorption coefficient, «, was the difference between the initial and final adjusted volumes divided by the volume of solvent.	ESTIMATED ERROR: REFERENCES: 1. Mellor, J.W.Comprehensive on Inorganic & Theoretica	l	
	Chemistry, Vol. IX, Longma London, 1929.	ans,	

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COMPONENTS:	ORIGINAL M	EASUREMENTS :	
<pre>1. Arsine; AsH<sub>3</sub>; [7784-42-1] 2. Chlorinated alkanes.</pre>	Corriez	, P.; Berton, pance <u>1950</u> , 43	A. Bull. Soc. -45
VARIABLES:	PREPARED B	Υ:	
		P. G. T. F	odâ
EXPERIMENTAL VALUES:			
Solvent	т/к	Bunsen coefficient «	Mole fraction* <sup>x</sup> AsH <sub>3</sub> (1 atm)
Dichloromethane; CH <sub>2</sub> Cl <sub>2</sub> ; [75-09-2]	298.2	10.7	0.0300
Trichloromethane, (Chloroform); CHCl <sub>3</sub> ; [67-66-3]	298.2	10.9	0.0379
5	298.2	11.7	0.0485
1,2-Dichloroethane; C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> ; [107-06-2]	298.2	8.8	0.0304
1,1,2,2-Tetrachloroethane; C <sub>2</sub> H <sub>2</sub> Cl <sub>4</sub> ; [79-34-5]	298.2	9.7	0.0440
1,2-Dichloroethene; C <sub>2</sub> H <sub>2</sub> Cl <sub>2</sub> ; [540-59-0]	298.2	12.3	0.0404
Trichloroethene; C2HCl3; [79-01-6]	298.2	12.5	0.0482
Tetrachloroethene; C <sub>2</sub> Cl <sub>4</sub> ; [127-18-4]	298.2	11.2	0.0490

\* Calculated by compiler using the density of arsine given in ref. (1) and the densities of solvents given in refs. (2), (3) and (4).

AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE: The initial volume of gas was measured over mercury in a gas burette at the barometric pressure. This volume was adjusted to 0 °C and 1 atm by the relation PV = RT. Gas was passed into an absorption pipette containing	NO INFORMATION GIVEN.	
a known volume of liquid S. The final volume of gas was measured at the barometric pressure, $p_{total}$ . The final pressure of arsine, $p_{ASH_3}$ , was taken to be $p_{total}$ minus vapor pressure of pure solvent. The final volume of gas was adjusted from $p_{ASH_3}$ to 1 atm and 0 °C. The Bunsen absorption coefficient, $\alpha$ , was the difference between the initial and final adjusted volumes divided by the volume of solvent.	<ul> <li>REFERENCES:</li> <li>1. Mellor, J.W., Comprehensive Treatise on Inorganic &amp; Theoretical Chemistry, Vol. IX, Longmans, London. <u>1929</u>.</li> <li>2. R.R. Dreisbach, Physical Properties of Chemical Compounds, A.C.S., Washington. <u>1959</u>, <u>1961</u>.</li> <li>3. Handbook of Chemistry &amp; Physics (61st edition), C.R.C. Press, Cleveland, Ohio. <u>1980</u>.</li> <li>4. Lange's Handbook of Chemistry (12th edition), McGraw-Hill, New York. <u>1979</u>.</li> </ul>	

**Stibine Solubilities** 

COMPONENTS:	EVALUATOR:
l. Stibine; SbH3; [7803-52-3] 2. Organic liquids	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London, N7 8DB, UNITED KINGDOM.
	August 1983

#### CRITICAL EVALUATION:

Distribution constants for systems consisting of the gas and eight different liquids have been measured by Devyatykh *et al.* (1) using a chromatographic technique. (See comments under arsine evaluation and on compiled tables.) It is, however, unwise to equate these constants with Ostwald coefficients in order to calculate solubilities for a particular partial pressure of gas. Analogy with measurements on phosphine reported by these authors makes it likely that such estimates could be several hundred per cent too large. The data may perhaps be used to estimate relative solubilities of stibine in different solvents but such estimates are unlikely to be very precise.

### References

 Devyatykh, G. G.; Ezheleva, A. E.; Zorin, A. D.; Zueva, M. V. Zh. Neorgan. Khim. <u>1963</u>, 8, 1307 (Russ. J. Inorg. Chem. <u>1963</u>, 8, 678).

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Stibine Solubilities 311		
COMPONENTS:	ORIGINAL MEASUREMENTS:	
1. Stibine; SbH <sub>3</sub> ; [7803-52-3]	Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.	
2. Various liquids	Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682	
VARIABLES: Temperature	PREPARED BY: P.G.T. Fogg	
EXPERIMENTAL VALUES:		
	cribution constant Heat of solution ol <sub>SbH</sub> /vol <sub>solvent</sub> /kcal mol <sup>-1</sup>	
2-Furancarboxaldehyde; C <sub>5</sub> H <sub>4</sub> O <sub>2</sub> ; [98-01-1]	25.2 -4.1	
Triethoxysilane; C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	39.8 - 6.0	
<pre>Silicic acid, tetraethyl ester; C<sub>8</sub>H<sub>20</sub>O<sub>4</sub>Si; [78-10-4]</pre>	28.5 - 5.4	
Silicone VKZh-94B	58.8 - 6.2	
the variation of distribution constant	these measurements were made were tibine and carrier gas was about constants were reported at one on, said to have been calculated from	
AUXILIARY INFORMATION		
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
A chromatographic method was used. Temperatures were controlled to ±0.5K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrog- en gas. The distribution constant, K, was calculated from the James and Martin equation: $V_{\rm R} = V_{\rm g} + KV_{\rm l}$ where V <sub>R</sub> is the retention volume for stibine.	1. Prepared from SbCl <sub>3</sub> and aqueous sodium tetrahydroborate; purified by vacuum distillation; chromatographic analysis indicated about 5% H <sub>2</sub> . H <sub>2</sub> & N <sub>2</sub> : passed through activated carbon and through molecular sieve. ESTIMATED ERROR:	

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COMPONENTS: ORIGINAL MEASUREMENTS: 1. Stibine; SbH<sub>3</sub>; [7803-52-3] Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V. 2. Various liquids. Russ. J. Inorg. Chem. 1963,8, 678-682. EXPERIMENTAL VALUES:  $\ln K = (-\Delta H/RT) + A$ where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the correspond-ing value of the heat of solution. The equation for K may be written in the form :  $K = \exp \left[A + (B/T)\right]$ The following values of A and B have been calculated by the compiler: Solvent Α B/K 2-Furancarboxaldehyde -3.8142064 Triethoxysilane -6.620 3021 Silicic acid, tetraethyl ester -5.924 2719 Silicone VKZh-94B -6.573 3122 In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment. In addition, possible adsorption of stibine at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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5000	ne Solubilities		31
COMPONENTS:	ORIGINAL M	EASUREMENTS:	
<pre>l. Stibine; SbH<sub>3</sub>; [7803-52-3] 2. Various liquids '</pre>	Zorin, Russ. J	kh, G. G.; Ezhe A. D.; Zueva, M . Inorg. Chem. , 678-682.	
VARIABLES:	PREPARED B	Y:	
Temperature		P. G. T. F	ogg
EXPERIMENTAL VALUES: Solvent	P <sub>SbH3</sub> /mmHg	Distribution constant <sup>vol</sup> SbH <sub>3</sub> /vol <sub>solvent</sub>	Heat of solution /kcal mol <sup>-1</sup>
2-Ethoxyethanol; C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> ; [110-80-5]	0.3	40.7	-1.2
l,l'-oxybis[2-chloroethane]; C4H8Cl2O; [111-44-4]	0.2	28.9	-3.5
Nitrobenzene; $C_6H_5NO_2$ ; [98-95-3]	0.2	22.9	-1.82
Liquid paraffin	0.3	39.7	-
Temperature = 293.2 K. 760 mm Distribution constants were measure total pressure of stibine and carry tion constants were reported at or said to have been calculated from with temperature, were given. If constants vary with temperature ac $\ln K = (-\Delta H/H)$	red between 2 rier gas of a ne temperatur the variatic f it is assum ccording to e	78.2 K and 323.2 bout 760 mmHg. e only but heats n of distributio ed that distribu	K with a Distribu- of solution n constants tion
where $K$ is the distribution constant	ant for a tem	nerature T. AH i	s the heat

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat (cont.)

AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MATERIALS:	
A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, $V_{g}$ , of the liquid phase was calculated from the weight of	<ul> <li>1. Prepared from SbCl<sub>3</sub> and aqueous sodium tetrahydroborate; purified by vacuum distillation; chromatographic analysis indicated about 5% H<sub>2</sub>.</li> <li>H<sub>2</sub> and N<sub>2</sub>: passed through activated carbon and through molecular sieve.</li> </ul>	
the column before and after filling		
with liquid and allowing to drain. The free volume, $V_g$ , was equated with the retention volume for hydrogen gas. The distribution constant, <i>K</i> , was calculated from the James and Martin equation: $V_R = V_g + KV_k$	REFERENCES:	
where $V_R$ is the retention volume for stibine.		

**Stibine Solubilities** 

COMPONENTS:		ORIGINAL MEASUREMENTS:
<ol> <li>Stibine; SbH<sub>3</sub>;</li> <li>Various liquids</li> </ol>	[7803-52-3]	Devyatykh, G. G.; Ezheleva, A. E.; Zorin, A. D.; Zueva, M. V. <i>Russ. J. Inorg. Chem.</i> <u>1963</u> , 8, 678-682.

EXPERIMENTAL VALUES:

of solution of stibine in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $K = \exp [A + (B/T)].$ 

The following values of A and B have been calculated by the compiler:

Solvent	А	в/к
2-Ethoxyethanol	1.645	604
1,1'-oxybis[2-chloroethane]	-2.647	1762
Nitrobenzene	0.006	916

In the opinion of the compiler these distribution constants can not be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of stibine at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

COMPONENTS:	EVALUATOR:
<pre>1. Silane; SiH<sub>4</sub>; [7803-62-5] Germane; GeH<sub>4</sub>; [7782-65-2] Stannane; SnH<sub>4</sub>; [2406-52-2] 2. Organic liquids.</pre>	P. G. T. Fogg, School of Chemistry, Polytechnic of North London, Holloway, London N7 8DB, United Kingdom. October 1983

#### CRITICAL EVALUATION:

Devyatykh *et al*. (1) measured distribution constants for each of the three gases and several solvents by a chromatographic method. It is, however, unwise to equate these constants with Ostwald coefficients in order to estimate solubilities. The data may, perhaps, be used to estimate relative solubilities but such estimates may not be precise.

The solubility of silane in cyclohexane was measured by Cauquil (2). Very simple apparatus was used. The possibility that equilibrium between gas and liquid was not achieved should be borne in mind.

### References:

- 1. Devyatykh, G. G.; Ezheleva, A. E.; Zorin, A. D.; Zueva, M. V. Zh. Neorgan. Khim. <u>1963</u>, 8, 1307. (Russ. J. Inorg. Chem. <u>1963</u>, 8, 678.)
- Cauquil, G.
   J. Chim. Phys. Phys. Chim. Biol. <u>1927</u>, 24, 53.

COMPONENTS:		ORIGINAL MEASUDEWENTS -	
COMPONENTS: 1. Silane; SiH <sub>4</sub> ; [7803-62-5] 2. Various liquids		ORIGINAL MEASUREMENTS: Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V. <i>Russ. J. Inorg. Chem.</i> <u>1963</u> ,8, 678-682.	
VARIABLES: Temperature, press	ure	PREPARED BY: P.G.T. Fogg	
EXPERIMENTAL VALUES:			
Solvent	Pressure range /mmHg	Distribution constant <sup>VOl</sup> SiH <sub>4</sub> /VOlsolvent	Heat of solution /kcal mol-'
2-Ethoxyethanol; C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> ; [110-80-5]	0.5 -17.1	.8 3.24	-1.2
l,l <sup>^</sup> -oxybis [2-chloro- ethane]; C <sub>4</sub> H <sub>8</sub> Cl <sub>2</sub> O; [lll-44-4]	0.06 -21.0	4.02	-1.2
Nitrobenzene, C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ; [98-95-3]	0.03 -18.7	4.38	-0.93
Liquid paraffin	0.5 -50.0	5.46	-3.8
Silicone PFMS-4F	0.05 -34.0	6.4	-2.2
Temperature = 293.2 K.	760 mmHg =	$= 1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$	
Distribution constants were measured range of partial pressures of silane mmHg. At a fixed temperature the dis from the mean values by more than ±3% at one temperature only but heats of ated from the variation of distributi given. If it is assumed that distrib ure according to equations of the for		stribution constants did n . These mean values were solution, said to have be on constants with tempera oution constants vary with	ot depart reported en calcul- ture, were
	AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	······	SOURCE AND PURITY OF MATERIALS	5:
A chromatographic method was used. Temperatures were controlled to $\pm$ 0.5 K. The support phase consist- ed of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and Martin equation : $V_{\rm R} = V_{\rm g} + KV_{\rm I}$		<ol> <li>Prepared by dispropo of triethoxysilane i presence of metallic distilled with low t still; chromatograph pure.</li> <li>H<sub>2</sub> &amp; N<sub>2</sub>: passed thro carbon and through m sieve.</li> </ol>	rtionation n the sodium; emperature ically ugh activated
		ESTIMATED ERROR:	
where V <sub>R</sub> is the retention silane.	volume for	REFERENCES :	

COMPONENTS:

1. Silane; SiH<sub>4</sub>; [7803-62-5]

2. Various liquids

ORIGINAL MEASUREMENTS:

Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.

Russ, J. Inorg. Chem. <u>1953</u>, 8, 678-682.

EXPERIMENTAL VALUES:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature  $T, \Delta H$  is the heat of solution of silane in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form :

 $K = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	в/к
2-Ethoxyethanol	-0.885	604
1,1'oxybis [2-chloroethane]	-0.670	604
Nitrobenzene	-0.120	468
Liquid paraffin	-4.828	1913
Silicone PFMS-4F	-1.922	1108

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of the silane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

COMPONENTS:	OPTCINAL MEACUPRIMINE
	ORIGINAL MEASUREMENTS:
1. Silane; SiH <sub>4</sub> ; [7803-62-5]	Devyatykh, G.G.; Ezheleva, A.E.; Zorin, A.D.; Zueva, M.V.
2. Various liquids	Russ. J. Inorg. Chem. 1963,8,
	678-682
VARIABLES: Temperature	PREPARED BY: P.G.T. Fogg
i emperature	1.0.1. 1099
· · · · · · · · · · · · · · · · · · ·	
EXPERIMENTAL VALUES:	
	ribution constant Heat of solution <sup>l</sup> /vol /kcal mol <sup>-1</sup> SiH <sub>4</sub> solvent
2-Furancarboxaldehyde; C <sub>5</sub> H <sub>4</sub> O <sub>2</sub> ;	
[98-01-1]	3.08 -4.4
1,2-Benzenedicarboxylic acid,	
didecyl ester; C28H46O4;	
[84-77-5]	4.8 -3.8
Triethoxysilane; C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	2.8 -6.0
Silicic acid, tetraethyl ester; C <sub>8</sub> H <sub>20</sub> O <sub>4</sub> Si; [78-10-4]	5.10 -5.4
Silicone 702-DF	3.8 -2.0
Silicone VKZh-94B	3.0 -4.3
Temperature = 293.2 K Distribution constants were measure	
	n these measurements were made were not ne and carrier gas was about 760 mmHg ts were reported at one temperature have been calculated from the
AUXILIARY	INFORMATION
METHOD /APPARATUS / PROCEDURE :	SOURCE AND PURITY OF MATERIALS:
A chromatographic method was used.	1. Prepared by disproportionation
Temperatures were controlled to ±0.5K	
The support phase consisted of Nichrome spirals. The carrier gas	presence of metallic sodium; distilled with low temperature
was either nitrogen or hydrogen. The volume, $V_1$ , of the liquid phase was	still; chromatographically pure.
calculated from the weight of the	$H_2 \& N_2$ : passed through activat-
column before and after filling with liquid and allowing to drain. The	ed carbon and through molecular sieve.
free volume, V <sub>q</sub> , was equated with	SIEVE.
the retention volume for hydrogen gas	
The distribution constant, <i>K</i> , was calculated from the James and Martin	ESTIMATED ERROR:
equation:	
$v_{R} = v_{g} + K v_{l}$	
where $V_{R}$ is the retention volume	REFERENCES:
for silane.	

COMPONENTS:	ORIGINAL MEASUREMENTS:
l. Silane; SiH <sub>4</sub> ; [7803-62-5] 2. Various liquids	Devyatykh, G.G. Ezheleva, A.E. Zorin, A.D.; Zueva, M.V. <i>Russ. J. Inorg. Chem.</i> <u>1963,</u> 8, 678-682.

EXPERIMENTAL VALUES:

variation of distribution constants with temperature, were given.

If it is assumed that distribution constants vary with temperature according to equations of the form:

 $\ln \kappa = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form :

 $K = \exp [A + (B/T)]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	B/K
2-Furancarboxaldehyde	-6.431	2215
1,2-Benzenedicarboxylic acid, didecyl ester	-4.957	1913
Triethoxysilane	-9.274	3021
Silicic acid, tetraethyl este	er-7.644	2719
Silicone 702-DF	-2.100	1007
Silicone VKZh-94B	-6.286	2165

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of silane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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COMPONENTS:	ORIGINAL MEASUREMENTS:
<pre>1. Silane, SiH<sub>4</sub>; [7803-62-5] 2. Cyclohexanol, C<sub>6</sub>H<sub>12</sub>O; [108-93-0]</pre>	Cauquil, G. J. Chim. Phys. Phys. Chim. Biol. <u>1927</u> , 24, 53-55.
	·
VARIABLES:	PREPARED BY: P. G. T. Fogg
EXPERIMENTAL VALUES:	L
T/K <sup>p</sup> SiH <sub>4</sub> /mmHg Ostw	ald coefficient Mole fraction* L $x_{SiH_4}$ (1 atm)
299.2 765	0.097 0.00042
<pre>760 mmHg = 1 atm 1 atm = 1.013 x 10<sup>5</sup> Pa * Calculated by the compiler using equation for SiH<sub>4</sub> given in ref.</pre>	constants of the van der Waals (1) and densities of C <sub>6</sub> H <sub>12</sub> 0 given
	INFORMATION
METHOD/APPARATUS/PROCEDURE: A measured volume of cyclohexanol was put into contact with a measured volume of silane in a graduated tube over mercury. The final volume of gas and the temperature and pressure were measured when equilibrium had been reached. The author considered that no allowance for the vapor pressure of cyclohexanol at the temperature of measurement was necessary.	SOURCE AND PURITY OF MATERIALS: C <sub>6</sub> H <sub>12</sub> O: dissolved air removed by boiling. b.p. 334.1 K (766 mmHg) ESTIMATED ERROR:
	<ul> <li>REFERENCES:</li> <li>1. Handbook of Chemistry &amp; Physics (61st edition), C.R.C. Press, Cleveland, Ohio. <u>1980</u>.</li> <li>2. J. Timmermans, Physico-Chemical Constants of Pure Organic Compound. Vol. 2, Elsevier, Amsterdam. <u>1965</u>.</li> </ul>

COMPONENTS:		ORIGINAL MEASUREMENTS:	
1. Germane, GeH <sub>4</sub> ; [7782-	65-2]	Devyatykh, G.G.; Ezhel Zorin, A.D.; Zueva, M.	
2. Various liquids			
		Russ. J. Inorg. Chem. 678-682.	<u>1963</u> ,8,
		070-002.	
VARIABLES:		PREPARED BY:	
Temperature, press	ure	P.G.T. Fogo	J•
EXPERIMENTAL VALUES:			
Solvent	Pressure	Distribution constant	Heat of
	range	vol <sub>GeH4</sub> /vol <sub>solvent</sub>	solution
	/mmHg	Sent Dorvene	/kcal mol-1
2-Ethoxyethanol, C <sub>4</sub> H <sub>10</sub> O <sub>2</sub> ;	0 1 - 19 5	6.24	-1.3
[110-80-5]	0.1 10.5	0.24	1.0
<pre>l,1'-oxybis [2-chloroethane],</pre>	0.05- 16.3	8.57	-1.5
$C_4H_8Cl_2O;$ [111-44-4]			
Nitrobenzene, C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ;	0 02- 10 0	9.0	-1.64
[98-95-3]	0.03- 19.0	9.0	-1.04
Liquid paraffin	0.4 - 43.5	9.4	-3.4
Silicone PFMS-4F	0.03- 22.0	11.7	-3.0
			•
Temperature = 293.2K.	760  mmHg =	$1 \text{ atm} = 1.013 \times 10^5 \text{ Pa.}$	
Distribution constants wer range of partial pressures			
mmHg. At a fixed temperat	ure the dist	ribution constants did n	ot depart
from the mean values by mo	re than ±3%.	These mean values were	e reported
at one temperature only bu ated from the variation of	t heats of s	olution, said to have be	en calcul-
given. If it is assumed t	hat distribution	tion constants with tempera	temperature
	AUXILIARY	INFORMATION	
METHOD / APPARATUS / PROCEDURE :		SOURCE AND PURITY OF MATERIA	15.
	_		
A chromatographic method		1. Prepared by reduction	
Temperatures were control ± 0.5 K. The support pha		lithium tetrahydroal ether; distilled wit	
consisted of Nichrome spi	rals. The	temperature still; c	
carrier gas was either ni	trogen	N. and N. a pageod t	hrough
or hydrogen. The volume, the liquid phase was calc	vl, Or ulated	H <sub>2</sub> and N <sub>2</sub> : passed t activated carbon and	
from the weight of the co		molecular sieve.	
and after filling with li			
allowing to drain. The f volume, V <sub>g</sub> , was equated w	ith the		
retention volume for hydr		NORTHARED PREAD	
The distribution constant	, K, was	ESTIMATED ERROR:	
calculated from the James	and		
Martin equation:			
$v_{R} = v_{q} + K v_{l}$		DEFEDENCES.	·
where $V_{R}$ is the retention	volume for	REFERENCES:	
	. or and rot		
germane.			
	······································		

COMPONENTS: 1. Germane, GeH<sub>4</sub>; [7782-65-2]

2. Various liquids

ORIGINAL MEASUREMENTS

Devyatykh, G.G.; Ezheleva, A.E. Zorin, A.D.; Zueva, M.V.

Russ. J. Inorg. Chem. <u>1963</u>, 8, 678-682.

EXPERIMENTAL VALUES:

according to equations of the form:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature  $T, \Delta H$  is the heat of solution of germane in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $K = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	A	B/K
2-Ethoxyethanol	-0.402	655
1,1'-oxybis [2-chloroethane]	-0.428	755
Nitrobenzene	-0.619	826
Liquid paraffin	-3.598	1712
Silicone PFMS-4F	-2.692	1511

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of the germane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

		323
COMPONENTS: 1. Germane; GeH <sub>4</sub> ; [7782-65-2] 2. Various liquids	ORIGINAL MEASUREMENTS: Devyatykh, G.G.; E Zorin, A.D.; Zueva Russ. J. Inorg. Ch. 678-682.	, M.V.
VARIABLES: Temperature	PREPARED BY: P.G.T.	Fogg
EXPERIMENTAL VALUES:		
Solvent Di	stribution constant <sup>Vol</sup> GeH <sub>4</sub> solvent	Heat of solution / kcal mol <sup>-1</sup>
2-Furancarboxaldehyde, C <sub>5</sub> H <sub>4</sub> O <sub>2</sub> ; [98-01-1]	8.31	-4.5
l,2-Benzenedicarboxylic acid, didecyl ester, C <sub>28</sub> H <sub>46</sub> 0 <sub>4</sub> ;[84-77-5]	7.4	-3.4
Triethoxysilane, C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	6.8	-4.4
Silicic acid, tetraethyl ester, $C_{\theta}H_{2,0}O_{4}Si;$ [78-10-4]	11.72	-6.4
Silicone 702-DF	6.14	-3.2
Silicone VKZh-94B	3.98	-4.3 -
Temperature = 293.2 K		
Distribution constants were measured partial pressures of germane at which not stated. The total pressure of ge 760 mmHg in each case. Distribution temperature only but heats of solution from the variation of distribution co	these measurements wermane and carrier gas constants were repor- on, said to have been	were made were s was about ted at one calculated
AUXILIARY	INFORMATION	
METHOD/APPARATUS/PROCEDURE:	SOURCE AND PURITY OF MAT	ERIALS:
A chromatographic method was used. Temperatures were controlled to $\pm$ 0.5K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>1</sub> , of the liquid phase was calculated from the weight of the colum before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and Martin equation:	$H_2$ . $H_2$ and $N_2$ : pass activated carbon molecular sieve	ahydroaluminate lled with low ll; contained 5% sed through
$V_R = V_g + KV_1$ where $V_R$ is the retention volume for germane.	REFERENCES:	

Solubilities of Silane, Germane and Stannane

COM	1PONENTS:	ORIGINAL MEASUREMENTS
1.	Germane; GeH <sub>4</sub> ; [7782-65-2]	Devyatykh, G.G.; Ezheleva, A.E. Zorin, A.D.; Zueva, M.V.
2.	Various liquids	Russ. J. Inorg. Chem. <u>1963</u> ,8, 678-682.

EXPERIMENTAL VALUES:

If it is assumed that distribution constants vary with temperature according to equations of the form:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature  $T, \Delta H$  is the heat of solution in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $K = \exp \left[A + (B/T)\right]$ 

The following values of A and B have been calculated by the compiler:

Solvent	А	B/K
2-Furancarboxaldehyde	-5.611	2266
<pre>l,2-Benzenedicarboxylic acid, didecyl ester</pre>	-3.837	1712
Triethoxysilane	-5.639	2215
Silicic acid, tetraethyl ester	-8.530	3222
Silicone 702-DF	-3.681	1611
Silicone VKZh-94B	-6.003	2165

In the opinion of the compiler these distribution constants cannot be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of the germane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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COMPONENTS:	LOD TOTAL		
	ORIGINAL	MEASUREMENTS:	
<pre>1. Stannane; SnH<sub>4</sub>; [2406-52-2]</pre>	Devyaty	kh, G. G.; Ezhele	eva, A. E.;
	Zorin,	A. D.; Zueva, M.	v.
2. Various liquids	Russ. J	. Inorg. Chem.	
	1963, 8	, 678-682.	
	1		
VARIABLES:	PREPARED	RY •	<u> </u>
Temperature, pressure		P. G. T. FC	ogg
	1	· · · · · · · · · · · · · · · · · · ·	
EXPERIMENTAL VALUES:		Distribution	Heat of
Solvent	<sup>p</sup> SnH <sub>4</sub>	constant	solution
		vol SnH4	/kcal mol
	/mmHg	/vol solvent	
······································			
2-Ethoxyethanol; C4H10O2; [110-80-5]	0.5	26.2	7 54
<pre>[110-80-5] 1,1'-oxybis[2-chloroethane];</pre>	0.5	26.2	-1.54
$C_{4}H_{8}Cl_{2}O;$ [111-44-4]	0.3	27.3	-2.3
Nitrobenzene; C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ;			-2.5
[98-95-3]	0.9	15.4	-1.82
Liquid paraffin	1.2	17.0	-3.9
Silicone PFMS-4F	0.9	12.1	-2.8
ture only but heats of solution, said variation of distribution constants w is assumed that distribution constant	l to have	e been calculated f	From the
equations of the form:	s vary w	erature, were give	on. Tfit
equations of the form:	s vary w	erature, were give	on. Tfit
equations of the form:	INFORMATI	perature, were give with temperature ac	en. If it cording to
equations of the form:	s vary w	perature, were give with temperature ac	en. If it ccording to (cont.)
equations of the form: AUXILIARY	s vary w	perature, were give with temperature ac	en. If it ccording to (cont.)
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE:	INFORMATI	perature, were give with temperature ac	en. If it ccording to (cont.)
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used.	INFORMATI SOURCE AL 1. Prep with	verature, were give with temperature ac on ND PURITY OF MATERIALS pared by reduction aqueous sodium te	en. If it coording to (cont.) : : of SnCl <sub>4</sub> etrahydro-
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to ±0.5 K. The support phase consisted	INFORMATI SOURCE AL 1. Prep with bora	verature, were give with temperature ac on ND PURITY OF MATERIALS vared by reduction aqueous sodium te te in acid; purif	of SnCl <sub>4</sub> etrahydro- ied by
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to ±0.5 K. The support phase consisted of Nichrome spirals. The carrier	INFORMATI SOURCE AL 1. Prep with bora	verature, were give with temperature ac on ND PURITY OF MATERIALS vared by reduction aqueous sodium te te in acid; purif	of SnCl <sub>4</sub> etrahydro- ied by
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to ±0.5 K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen.	INFORMATI SOURCE AN 1. Prep with bora vacu ~ 5%	ON ND PURITY OF MATERIALS ared by reduction aqueous sodium te te in acid; purif uum distillation; H <sub>2</sub> .	en. If it ccording to (cont.)  of SnCl. etrahydro- fied by contained
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to ±0.5 K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase	INFORMATI SOURCE AN 1. Prep with bora vacu ~ 5%	verature, were give with temperature ac on ND PURITY OF MATERIALS vared by reduction aqueous sodium te te in acid; purif	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to ±0.5 K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>L</sub> , of the liquid phase was calculated from the weight of	INFORMATI SOURCE AN 1. Prep with bora vacu ~ 5%	ND PURITY OF MATERIALS ared by reduction aqueous sodium te te in acid; purif uum distillation; H <sub>2</sub> . N <sub>2</sub> : passed throug	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling	INFORMATI SOURCE AN 1. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif um distillation; H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve.	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, $V_{l}$ , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain.	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif um distillation; H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve.	en. If it cording to (cont.) (
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif um distillation; H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve.	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif um distillation; H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve.	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K,	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and Martin equation:	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it ccording to (cont.)(
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, V <sub>l</sub> , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, V <sub>g</sub> , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and Martin equation:	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it cording to (cont.) (
equations of the form: AUXILIARY METHOD/APPARATUS/PROCEDURE: A chromatographic method was used. Temperatures were controlled to $\pm 0.5$ K. The support phase consisted of Nichrome spirals. The carrier gas was either nitrogen or hydrogen. The volume, $V_{g}$ , of the liquid phase was calculated from the weight of the column before and after filling with liquid and allowing to drain. The free volume, $V_{g}$ , was equated with the retention volume for hydrogen gas. The distribution constant, K, was calculated from the James and Martin equation: $V_{R} = V_{g} + KV_{g}$	INFORMATI SOURCE AN I. Prep with bora vacu $\sim$ 5% H <sub>2</sub> and ESTIMATE	ON ND PURITY OF MATERIALS Pared by reduction aqueous sodium te te in acid; purif H <sub>2</sub> . N <sub>2</sub> : passed throug carbon and th cular sieve. D ERROR:	en. If it ccording to (cont.)(

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Solubilities of Silane, Germane and Stannane

COMPONENTS:	ORIGINAL MEASUREMENTS:	1
l. Stannane; SnH <sub>4</sub> ; 2. Various liquids	<pre>[2406-52-2] Devyatykh, G. G.; Ezheleva, J Zorin, A. D.; Zueva, M. V. Russ. J. Inorg. Chem. 1963, 8, 678-682.</pre>	A. E.;

EXPERIMENTAL VALUES:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution of stannane in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

```
K = \exp \left[A + (B/T)\right].
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The following values of A and B have been calculated by the compiler:

Solvent	А	в/к
2-Ethoxyethanol	0.621	775
1,1'-oxybis[2-chloroethane]	-0.643	1158
Nitrobenzene	-0.391	916
Liquid paraffin	-3.864	1964
Silicone PFMS-4F	-2.315	1410

In the opinion of the compiler these distribution constants can not be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of stannane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

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COMPONENTS :	ORIGINAL MEASUREMENTS:	
		Francisco
<pre>1. Stannane; SnH<sub>4</sub>; [2406-52-2]</pre>	Devyatykh, G. G.;	
	Zorin, A. D.; Zue	
2. Various liquids	Russ. J. Inorg. Ch	iem.
	<u>1963</u> , <i>8</i> , 678-682.	
VARIABLES:	PREPARED BY:	
Temperature	Ρ.	G. T. Fogg
EXPERIMENTAL VALUES:		
	Distribution constant	Heat of solution
Solvent	vol SnH4	/kcal mol <sup>-1</sup>
	/vol <sub>solvent</sub>	·
2-Furancarboxaldehyde; C <sub>5</sub> H <sub>4</sub> O <sub>2</sub> ;	10.0	
[98-01-1]	18.2	-4.6
<pre>1,2-Benzenedicarboxylic acid, didecyl     ester; C<sub>20H46</sub>O<sub>4</sub>; [84-77-5]</pre>	8.3	-4.0
Triethoxysilane; C <sub>6</sub> H <sub>16</sub> O <sub>3</sub> Si; [998-30-1]	31.7	-6.0
Silicic acid, tetraethyl ester; C <sub>8</sub> H <sub>20</sub> O <sub>4</sub> Si; [78-10-4]	21.6	-5.0
Silicone 702-DF	10.0	-3.0
Silicone VKZh-94B	7.26	-5.6
Temperature = 293.2 K. Distribution constants were measured		
Distribution constants were measured is partial pressures of stannane at which not stated. The total pressure of standard for the state of the state	h these measurements tannane and carrier constants were repo n, said to have been	s were made were gas was about orted at one n calculated from
Distribution constants were measured is partial pressures of stannane at which not stated. The total pressure of so 760 mmHg in each case. Distribution	h these measurements tannane and carrier constants were repo n, said to have been	s were made were gas was about orted at one n calculated from , were given.
Distribution constants were measured 1 partial pressures of stannane at which not stated. The total pressure of s 760 mmHg in each case. Distribution temperature only but heats of solution the variation of distribution constant	h these measurements tannane and carrier constants were repo n, said to have been	s were made were gas was about orted at one n calculated from , were given.
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Solubilities of Silane, Germane and Stannane

COMPONENTS:	ORIGINAL MEASUREMENTS:
1. Stannane; SnH <sub>4</sub> ; [2406-52-2]	Devyatykh, G. G.; Ezheleva, A. E.; Zorin, A. D.; Zueva, M. V.
2. Various liquids	Russ. J. Inorg. Chem.
	<u>1963</u> , <i>8</i> , 678-682.

EXPERIMENTAL VALUES:

If it is assumed that distribution constants vary with temperature according to equations of the form:

 $\ln K = (-\Delta H/RT) + A$ 

where K is the distribution constant for a temperature T,  $\Delta H$  is the heat of solution in the solvent and A is a constant for the solvent, then distribution constants at any temperature in the range 278.2 K to 323.2 K may be estimated from a value at 293.2 K and the corresponding value of the heat of solution. The equation for K may be written in the form:

 $K = \exp \left[A + (B/T)\right].$ 

The following values of A and B have been calculated by the compiler:

Solvent

2-Furancarboxaldehyde	-4.998	2316
1,2-Benzenedicarboxylic acid, didecyl ester	-4.753	2014
Triethoxysilane	-6.848	3021
Silicic acid, tetraethyl ester	-5.514	2518
Silicone 702-DF	-2.849	1511
Silicone VKZh-94B	-7.635	2820

Α

B/K

In the opinion of the compiler these distribution constants can not be equated with Ostwald coefficients unless the assumption is made that equilibrium was established between gas and liquid phases under the conditions of the experiment.

In addition, possible adsorption of stannane at the stationary phasecarrier gas interface may have lowered the accuracy of the results.

# SYSTEM INDEX

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Page numbers preceded with e refer to evaluations whereas those not preceded with e refer to compiled tables.Systems are indexed under solvents not under gases.

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Acetic acid, octyl ester	
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Acetic, trifluoro-, acid	
+ phosphine	e281,e282,290,301
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+ N-methylmethanamine	e83,162
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+ N-methylmethanamine	e83,155,175
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+ N-methylmethanamine	e82,140
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