IDENTIFICATION OF UNKNOWN ORGANIC COMPOUNDS

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INTRODUCTION

The analysis and identification of unknown organic compounds constitutes a very important aspect of experimental organic chemistry. One could easily have an idea of what the unknown compound is, in cases such as chemical reactions. However, when a compound is isolated from a natural source, one may be left clueless as to what the compound can be. Discovering the identity of an unknown organic compound requires figuring out which functional groups it contains and determining its molecular structure.

The purpose of this laboratory activity was to identify the functional groups present in the given unknown, and eventually identify what organic compound the unknown is. In order to accomplish this, a variety of different tests were done. First, preliminary tests were conducted. Afterwards, solubility tests were run. Physical properties (density, melting point) were also determined. The results of the solubility tests can indicate the size and polarity of an unknown compound, which can narrow down the possible functional groups in the unknown. Once the options were narrowed, further classification tests were run. These tests were used to identify specific functional groups in the unknown sample.

METHODOLOGY

Preliminary tests were first conducted. The physical characteristics (physical state, color, odor) of the unknown was noted. An ignition test was also performed by heating a small amount of the unknown (about 0.1 g) on a metal spatula. The flame produced was observed (luminous or sooty).

After these preliminary tests, the solubility test was performed. First, 2mL of water was pipetted into a test tube and then a few crystals of the unknown were added. The solution was shaken. Solubility of the unknown was observed. If the unknown dissolved in water, the same procedure will be done but using ether as the solvent. If the unknown is insoluble in water, the solubility of the unknown will be tested with 5% NaOH. The next steps will be done according to the solubility flowchart (Figure 1) until it lands into a solubility class. The solubility of the unknown in the following reagents indicates the class of compound where it belongs and will be the basis of the classification tests to be conducted later on.

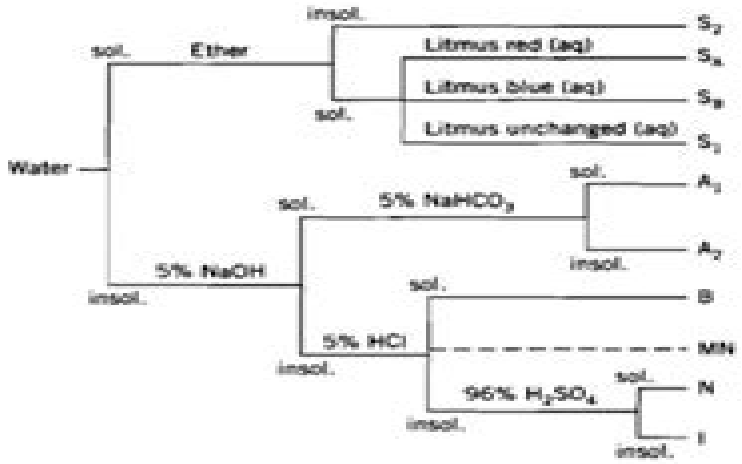

Figure 1. Classification of organic compounds by solubility (see Table 1 for compounds comprising each class). sol. = soluble, insol. = insoluble; litmus red is at pH below 4.5 and blue above 8.3.

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Dana W. Mayo,Ronald M. Pike,David C. Forbes

Identification Of Unknown Organic Compounds:

The Systematic Identification of Organic Compounds Christine K. F. Hermann,Terence C. Morrill,Ralph L. Shriner,Reynold C. Fuson,2023-03-08 The Systematic Identification of Organic Compounds A comprehensive introduction to the identification of unknown organic compounds Identifying unknown compounds is one of the most important parts of the study of chemistry From basic characteristics such as melting and or boiling point to more complex data generated through cutting edge techniques the range of possible methods for identifying unknown organic compounds is substantial The utility of a research reference which compiles known techniques and characteristics of possible compounds is clear The Systematic Identification of Organic Compounds provides such a reference designed to teach a hands on approach in the chemistry lab It takes readers step by step through the process of identifying an unknown compound and elucidating its structure from infrared nuclear magnetic resonance and mass spectra in addition to solubility characteristics melting point boiling point and classification tests The result is an essential overview for advanced chemistry students looking to understand this exciting area of laboratory work Readers of the ninth edition of The Systematic Identification of Organic Compounds will also find A detailed chapter on safety personal protection equipment chemical storage safety data sheets and other safety concerns New NMR IR and mass spectra with detailed explanations on interpretation Questions at the end of each chapter designed to facilitate and reinforce progression keyed to a companion website for instructors Tables of known compounds including data relevant for identification Companion website with structural problems from experimental data for students to practice how to reason and solve The Systematic Identification of Organic Compounds is a useful reference for advanced undergraduates and graduate students studying organic chemistry organic spectroscopy and related subjects The Systematic Identification of Organic Compounds, Set Christine K. F. Hermann,Terence C. Morrill,Ralph L. Shriner,Reynold C. Fuson,2023-05-02 **Organic Analytical Chemistry** Jag Mohan,2003 Rapid developments in analytical techniques and the use of modern reagents in organic synthesis during the last two decades have revolutionized the approach to organic structure determination As advanced topics in organic analysis such as spectroscopic methods are being introduced postgraduate students majoring in organic chemistry have been feeling handicapped by the non availability of a book that could uncover various aspects of qualitative and quantitative organic analysis This book is written primarily to stimulate the interest of students of organic chemistry and pharmaceutical sciences in organic analytical chemistry Key features Identification and characterization of organic compounds by classical methods Mechanism of various reactions involved in the detection of functional groups and their derivatization Functional groups interfering with a given test procedure Identification of organic compounds by spectral methods IR UV NMR and Mass Spectrometry Chemical analysis by other instrumental techniques Atomic emission spectroscopy Electron spin resonance spectroscopy Atomic absorption spectroscopy flnorimetry Phosphorimetry Flame photometry and X ray methods General techniques for separation and

purification including Gas Chromatography and HPLC Preparation of organic compounds based on important name reactions and pharmaceutical properties Mechanism of the reactions involved in the synthesis Simple analytical techniques and specific methods of quantitative elemental functional groups and biochemical estimations Composite spectral problems Incorporating ample modern techniques of organic analysis this book will be of great value to graduate postgraduate students teachers and researchers in the field of organic chemistry and pharmaceutical sciences **Microscale Organic Laboratory** Dana W. Mayo,Ronald M. Pike,David C. Forbes,2010-01-12 This is a laboratory text for the mainstream organic chemistry course taught at both two and four year schools featuring both microscale experiments and options for scaling up appropriate experiments for use in the macroscale lab It provides complete coverage of organic laboratory experiments and techniques with a strong emphasis on modern laboratory instrumentation a sharp focus on safety in the lab excellent pre and post lab exercises and multi step experiments Notable enhancements to this new edition include inquiry driven experimentation validation of the purification process and the implementation of greener processes including microwave use to perform traditional experimentation **Practical Pharmaceutical Organic Chemistry I & II** Mr. Rohit Manglik,2024-05-24 Provides detailed experimental procedures for synthesizing purifying and analyzing organic compounds used in pharmaceuticals **Laboratory Experiments on the Class Reactions and Identification of Organic Substances** Arthur Amos Noyes,Samuel Parsons Mulliken,1897 *A Method for the identification of pure organic compounds by a systematic analytical procedure based on physical properties and chemical reactions ... v. 1, 1911* Samuel Parsons Mulliken,1904 **A Method for the Identification of Pure Organic Compounds by a Systematic Analytical Procedure Based on Physical Properties and Chemical Reactions ...** Samuel Parsons Mulliken,1916 **The Systematic Identification of Organic Compounds** Ralph Lloyd Shriner,1980 Step by step instructions on identifying organic compounds The steps described include elemental analysis solubility infrared spectra nuclear magnetic resonance spectra mass spectra classification tests and preparation of a derivative Most directions for experiments are described in a micro or mini scale and clean up directions are given at the end of each procedure Emphasizes the systematic approach to identifying unknowns Offers a review of spectroscopy Discusses infrared nuclear magnetic resonance and mass spectroscopy and includes examples of spectra Discusses chromatography distillations and the separation of mixtures *A Method for the identification of pure organic compounds by a systematic analytical procedure based on physical properties and chemical reactions ... v. 2, 1916* Samuel Parsons Mulliken,1916 *Laboratory Manual of Pharmaceutical Organic Chemistry I* Mr. Sushant Sudhir Pande,Dr. Prashant D. Aragade,Dr. Saurabh C. Khadse,Dr. Niranjan S. Mahajan,2024-02-16 We are pleased to put forth the Laboratory Manual of Pharmaceutical Organic Chemistry I This manual prepared according to the PCI B Pharm course regulations 2014 is divided into three sections systematic qualitative analysis preparation of suitable solid derivatives and construction of molecular models The methods of all the experiments are drawn from the latest editions of

official books of pharmaceutical organic chemistry and research papers ensuring the inclusion of the latest advancements in methodologies or apparatus This manual is designed for outcome based education Each experiment follows a uniform format with sections for practical significance practical outcomes PrOs mapping with course outcomes theory resources used procedure precautions observations results conclusion references and synopsis questions Each experiment offers an opportunity for students to perform practical work developing proficiency in effectively managing equipment handling glassware chemicals reagents and writing analytical reports In addition the questions at the end of the experiments help to enhance students knowledge benefiting them as they pursue higher studies During the laboratory period you will have to multiple tasks while performing the experiment It is essential to document your actions and observations thoroughly as you proceed Always plan your work ahead considering what you are doing why you are doing it what is happening and what conclusions you can draw from your experiment We acknowledge the help and cooperation of various individuals in bringing out this manual We are highly indebted to the authors of the books and articles mentioned in the references which were a major source of information for this manual We also thank the publishers designers and printers who worked hard to publish this manual in a timely manner We hope that this manual will be helpful to students in understanding concepts principles and performing procedures We wish you all the best **Organic Compounds in Natural Waters** T Roy Crompton,2013-09-23 The potential health hazards that might arise from the presence of organic substances in water are a matter of increasing concern to the water industry environmentalists and the general public alike This comprehensive reference draws together and systematises the vast body of information available on the occurrence and determination of organic su Journal of the American Chemical Society American Chemical Society,1913 *American Journal of Pharmacy* ,1904 Practical Organic Chemistry Workbook Devanshi Magoo,Anju Srivastava,Sriparna Dutta,2025-07-11 This book is a unique laboratory workbook which is intended for the use of undergraduate students of various universities pursuing chemistry as the major subject and has been especially tuned as per the latest NEP UGCF syllabus It is also helpful to students pursuing biochemistry and pharmacy at college or university levels Further this workbook provides basic guidance in the essential experimental techniques that an undergraduate student must master to hone the skills required for training in chemical sciences To the best of our knowledge this is the first time that a workbook for NEP UGCF syllabus is being proposed for helping students acquire prior deep knowledge pertaining to a particular exercise objective and enthuse them by stimulating their scientific thinking through various pre and post lab questions formulated The current pedagogy demands a reformation in the conduct of the practicals under the new syllabi scheme therefore it is anticipated that this manual would be beneficial for the students as well as teachers in rendering the best Besides the book encompasses the fundamentals of all the techniques that would equip the practitioners with specific skills especially on various purification techniques such as recrystallization and chromatography without which one cannot think about proceeding with any synthesis in any of the chemical pharmaceutical

textile industries oil and petroleum industries and more *American Journal of Pharmacy and the Sciences Supporting Public Health* ,1904 *Chemical Addresses Delivered at the Second Decennial Celebration of Clark University* Clark University (Worcester, Mass.),1911 American Chemical Journal ,1898 American Chemical Journal Ira Remsen,Charles August Rouillu,1898 **Evaluation and Identification of Volatile Organic Compounds in Childhood Education Facilities** Asa Bradman,Rosemary Castorina,Tina Hoang,Fraser Gaspar,Alex Shi,2015

Decoding **Identification Of Unknown Organic Compounds**: Revealing the Captivating Potential of Verbal Expression

In a period characterized by interconnectedness and an insatiable thirst for knowledge, the captivating potential of verbal expression has emerged as a formidable force. Its power to evoke sentiments, stimulate introspection, and incite profound transformations is genuinely awe-inspiring. Within the pages of "**Identification Of Unknown Organic Compounds**," a mesmerizing literary creation penned by a celebrated wordsmith, readers set about an enlightening odyssey, unraveling the intricate significance of language and its enduring affect our lives. In this appraisal, we shall explore the book is central themes, evaluate its distinctive writing style, and gauge its pervasive influence on the hearts and minds of its readership.

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