



## IDENTIFICATION OF UNKNOWN ORGANIC COMPOUNDS

Department of Chemistry, College of Science, Bicol University, Legazpi City

### 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.

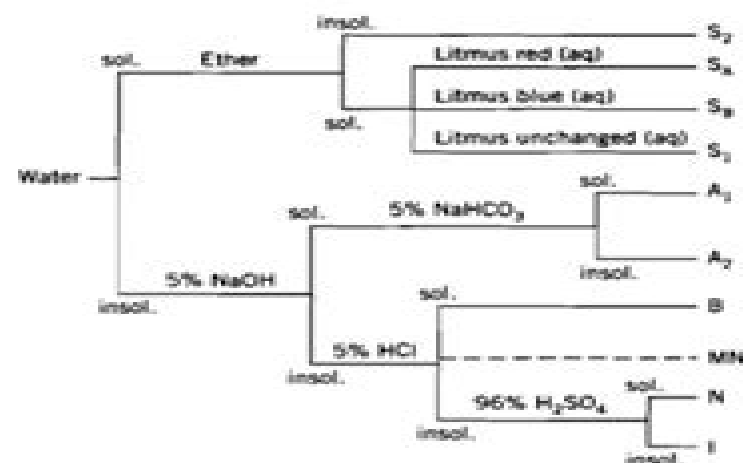


Figure 1. Classification of organic compounds by solubility (see Table 1 for compounds comprising each class). sol. = soluble; insol. = insoluble; litmus red is at pH below 4.5 and blue above 8.3.

# Identification Of Unknown Organic Compounds

**L Darling-Hammond**



## 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 **Systematic Lab**

**Experiments in Organic Chemistry** Arun Sethi, 2006 Basically The Book Has Been Written As A Textbook With An Intention To Serve The Students At The Graduate And Postgraduate Level The Subject Matter Is Based On The New Model Curriculum Recommended By The University Grants Commission For All Indian Universities The Book Provides An Exhaustive List Of Organic Compounds Methods Of Its Identification Its Derivatives Every Information Incorporated In Consolidated Form Exercises Included In The Book Not Only Describe Different Methods Techniques Of Preparation But Also Explain The Theoretical Background Of These Reactions It Also Describes Different Methods Of Isolation Of Some Important Class Of Compounds This Book Promotes Self Reliance Since It Is In Itself Complete Requiring No Reference To Other Texts

*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 **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

**The Systematic Identification of Organic Compounds, Set** Christine K. F. Hermann, Terence C. Morrill, Ralph L. Shriner, Reynold C. Fuson, 2023-05-02

**Laboratory Manual of Pharmaceutical Organic Chemistry I** Mr. Sushant Sudhir Pande, Dr. Prashant D. Aragade, Dr. Saurabh C. Khadse, Dr. Niranjana 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

**Laboratory Manual of Pharmaceutical Chemistry** Dr. Remeth J. Dias, Dr. Prashant D. Aragade, Mr. Sushant Sudhir Pande, 2023-09-28 We are very pleased to put forth the revised edition of Laboratory Manual of Pharmaceutical chemistry We have incorporated all the suggestions modified it to make it easier student friendly and relevant in terms of achieving curriculum outcome We are very much thankful to all the learned teachers who have given their feedback whole heartedly We have even incorporated the changes in this manual based on the feedback given by the teachers from all the institutes Now we believe that the manual has been fulfilling the aspirations of Pharmacotherapeutics teachers and students too This manual is prepared as per PCI Education Regulations 2020 for Diploma Course in Pharmacy The methods of all the experiments are reviewed and added

from the recent research papers so that the advancement in the methods or apparatus can be addressed This manual is designed for outcome based education and each experiment is arranged in a uniform way such as practical significance practical outcomes PrOs and its mapping with course outcomes minimum theoretical background resources used procedure precautions observations result conclusion references and related questions Moreover assessment scheme is also given to help the student and teacher to know what to be assessed Each experiment offers an opportunity to perform practical work allowing students to gain proficiency in effectively managing equipment handling glassware chemicals and reagents and writing analytical reports In addition questions are provided at the end of the experiments to enhance students knowledge which will be beneficial for them as they pursue higher studies We hope that this manual will assist students in understanding concepts principles and performing procedures We wish you all the best

Determination of Organic Compounds in Natural and Treated Waters T R Crompton,1999-10-14 A comprehensive reference which draws together and systematises the information available on the occurrence and determination of organic substances in all types of non saline and saline natural and treated waters It provides a comprehensive description of organic compounds in all natural and treated water types The book includes a series of table

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