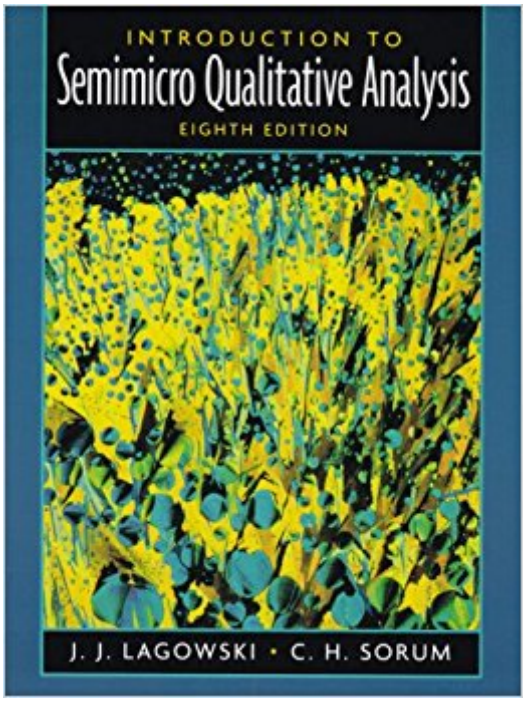
Introduction To Semimicro Qualitative Analysis (8th Edition)



Synopsis

This self-teaching lab manual presents a process for learning descriptive chemistry in the format of a scheme of analysis. Readers are challenged to call upon their manipulative and observational skills to provide the basis for identifying a substance or a mixture of substances. Describes the strategy of qualitative analysis so that readers have a review of the principles readily available when they are engaged in the details of laboratory work. Presents the concepts involved in qualitative analysis, systematically dealing with the nature of the chemical compounds. Features well-tested analytical procedures. Provides an early introduction to the principles of Ã¢â ¬Å“green chemistry.Ã¢â ¬Â• Includes a list of required equipment and a list of all reagents used with directions for preparing all solutions. A self-teaching manual useful for anyone who wants to learn more about chemistry in the laboratory.

Book Information

Paperback: 312 pages

Publisher: Pearson; 8 edition (October 10, 2004)

Language: English

ISBN-10: 0130462160

ISBN-13: 978-0130462169

Product Dimensions: 6.9 x 0.7 x 9 inches

Shipping Weight: 1 pounds (View shipping rates and policies)

Average Customer Review: 3.7 out of 5 stars 4 customer reviews

Best Sellers Rank: #104,238 in Books (See Top 100 in Books) #26 inÃ Â Books > Science & Math > Chemistry > Analytic #130 inÃ Â Books > Medical Books > Medicine > Internal Medicine > Pathology > Clinical Chemistry #477 inÃ Â Books > Science & Math > Chemistry > General & Reference

Customer Reviews

Semimicro Qualitative Analysis, Eighth Edition, addresses two important current issues in chemistry education: the need for students to acquire a knowledge of descriptive chemistry and a growing interest by teaching chemists to expose students to the concepts of "green chemistry." Although descriptive chemistry may be difficult to define precisely, most chemists would agree that a major component of this subject—descriptive chemistry—is the chemistry of the more common elements and their compounds, especially as this occurs in aqueous solutions. "Green chemistry," briefly, is an expression of doing chemistry—laboratory work—that minimizes the use of

chemicals, uses benign solvents (like water); and attends to the problems of handling "wastes" in a non-polluting way. The first part of this classic work discusses the general strategy of qualitative analysis. It then systematically surveys the nature of chemical compounds including ionic, covalent and coordination of compounds, and the chemical reactions they undergo. The second part provides a series of laboratory experiments to perform that have been tested over time, and reviewed to insure current treatment in terms of chemical safety and disposal. Key chemical concepts are highlighted along with important safety information. The discussion in Part I provides a firm foundation for understanding the practical work carried out in Part II.

The subject of qualitative analysis has its roots in the works of Boyle (1627-1691) who, some argue, laid the foundations for the subject by using flame colors, spot tests, "fumes," precipitates, specific gravity, and solvent action as analytical tools. The modern expression of qualitative analysis can be traced directly to Fresenius (1818-1897) whose thesis, published in 1842, was the basis for a successful student manual on qualitative analysis. This manual was revised repeatedly to keep the subject up to date as chemistry passed through a phase of uncertain notation and nomenclature and experienced the reforms instigated by Cannizzaro's use of Avogadro's hypothesis to clarify a number of apparently troublesome facts, and which clarified the "nature of the molecule." An American edition, translated by S.W. Johnson, appeared in 1869. The current interest in the need for students to "learn some descriptive chemistry" can be satisfied by a course in qualitative analysis. Although "descriptive chemistry" may be difficult to define precisely, most chemists would agree that a major component of this subject is the chemistry of the more common elements and their compounds. From this point of view, the chemistry of elements and their compounds is probably best expressed as the chemical processes that occur in an aqueous environment—processes that involve considerations of metathetical, redox, and complexation reactions, namely, the directions in which these processes occur (thermodynamics) as well as how rapidly they occur (kinetics). This kind of practical descriptive chemistry can be, and has been, discussed on the printed page, but we believe it is best learned by the student in a laboratory setting. We choose to use, as the basis of descriptive chemistry, the chemistry of the compounds of common metal canons formed with a relatively small number of anions. The focus of this kind of chemistry is qualitative analysis, a format that most students find engaging and informative. The basis for our analysis scheme is the relative solubilities of the chlorides, sulfides, and hydroxides of a representative selection of canons. Thus, we present a process for learning descriptive chemistry in the format of a scheme of analysis where students are challenged to bring to bear their

manipulative and observational skills to provide the basis for identifying a substance or a mixture of substances. In our experience, most students enjoy the "hunt" for the unknown. We recognize the fact that wet methods of qualitative analysis are not usually used in modern chemical laboratories; the scheme of analysis presented here is designed as a method of learning descriptive chemistry, not necessarily of providing a practical modern scheme of analysis. The interest in exposing our students early to the principles of "green chemistry"—using less chemicals and smaller volumes of solution in a benign solvent—is also met by providing them with an experience in the semimicro methods of qualitative analysis, which is the focus of the experimental processes described here. The experimental procedures outlined here are in consonance with the current "less-than-macro" trends in laboratory instruction. All the benefits of this strategy—small quantities of chemicals involved, simpler equipment, fewer hazards—accrue from the use of the semimicro methods of qualitative analysis described. The chapters in this edition are distributed into three parts. In Part I, we describe the strategy of qualitative analysis. We believe it is pedagogically beneficial for students to have a review of the principles readily available when they are engaged in the details of laboratory work. Accordingly, in Part II, we present the concepts involved in qualitative analysis; systematically dealing with the nature of chemical compounds, including ionic, covalent, and coordination compounds, and the chemical reactions they undergo, stressing solution processes and equilibria. The discussion in Part II is intended to support the practical aspects of qualitative analysis that appear in Part III. The well-tested analytical procedures of Part III from previous editions remain, for the most part, intact. Within each chapter of Part III is a general survey of the chemistry of the species in a qualitative analysis group of ions, followed by the experimental details for the ions in that group. We have attempted to direct the reader’s attention to certain important sections of Part III by using the following pictorial devices. An exclamation point symbol indicates a cautionary section, that is, a place in the directions where a safety problem could arise if the procedure is not followed carefully. A key symbol indicates a key idea, a place in the directions where a principle described in Part II is applied. The reader would benefit from recognizing the relationship of the principle to the action being described at the key symbol. We express our appreciation to users of previous editions, colleagues, and students for suggestions, comments, and criticisms, which were helpful in preparing this revision. We would also like to thank the following reviewers for their suggestions: Gerhard Buchbauer of the University of Vienna, Philip W Crawford of Southeast Missouri State University, Lisa C. Price of Bennett College, and Duanne E. Weisshaar of Augustana College. For invaluable assistance in the preparation of the manuscript for this edition, we express great appreciation to Rita D. Wilkinson. The editorial staff at Prentice

Hall are gratefully acknowledged for their extensive contributions to the production of this volume. J.J.L. Austin, Texas Note to instructors After a short overview of the strategy of qualitative analysis in Part I, we intend Part II, the theory of qualitative analysis, to be a review of the important principles of chemistry that pertain to the laboratory-oriented phenomena that are normally associated with qualitative analysis as described in Part III. Many of the questions at the end of the chapters in Part III serve to illustrate the principles developed in Part II. Conversely, the problems at the end of the chapters in Part II anticipate some of the more practical problems listed in Part III. A list of the required equipment appears in Appendix III. We find it useful to most students to be introduced to each piece of equipment and special technique at the time it is first used in the plan of analysis described here. The equipment is of the standard semimicro type available at most supply houses. Only a few items need to be prepared, but these can be made by the student. If H2S gas is used as a precipitating reagent, the student will need to prepare several hydrogen sulfide bubbling tubes from 6-mm glass tubing, as shown in Fig. 10.2 and described in the accompanying text. If each student is to prepare H2S by heating a mixture of sulfur, paraffin, and asbestos, simple generators of the type illustrated in Fig. 10.2 must be set up. Stirring rods will need to be cut from 3-mm glass rods and fire-polished. A list of all reagents used with directions for preparing all solutions is also given in Appendix III. The experimental procedures and specific tests have been checked numerous times; if the directions given are followed with care, good results will be obtained. We would appreciate being informed of errors, inconsistencies, or ambiguities in the procedures. In general, net equations are used to describe reactions that occur in solution in conformity with the principle that equations should indicate the predominant species in the system. No effort has been made to present the detailed mechanisms of the more complex reactions.

The content itself is superb; I’ve used this text before, but the copy I received was of poor quality. It looked like it came out of a consumer-grade laser printer or copier. Streaks from the fuser could still be seen on the pages. What’s sad is that it’s still full-price. The book was returned a few days later.

It was exactly what I read in the review. The object arrive before I expected. Also, It was in a very good shape. Best service!

this was just what i wanted and needed. although there was some writing in it, the product was what i needed.

Invariably, the final semister/quarter of General Chemistry involves determining the ions contained in an unknown solution. This can be a frustrating time for a student, which is in many instances due to the lack of clearly written and understandable laboratory procedures. When I took the class, I thankfully had a savvy professor who utilized this book (the Sixth edition) as the sole laboratory procedures. As a consequence, I did well in the lab (grade was an A) and had a positive experience. As a teaching assistant in graduate school, I recalled how useful this book was and developed my lectures based on its content (the Chemistry department at that university utilized its own "home grown" book of procedures which were sadly lacking in clarity). This book contains much of the necessary background in reaction kinetics, solution phenomenon, and ionic properties for each group that a student needs to perform and understand the experiments. Two of the most important and indispensable aspects of this book are the flow charts and the questions in each chapter. The flow charts provide a clear, overall picture of the procedures and are easy to follow. I implemented flow charts similar to these in my class with much success. Many of my students copied those flow charts and gave them to classmates in other laboratory sections. The questions were VERY helpful in clarifying how separations of the ions could be successfully achieved and the importance of reaction conditions during these separations. The questions, or variations of them, also made good lab quiz questions. (Hint, hint.) I highly recommend answering the questions prior to performing the lab to give yourself a better idea of what to expect when following the procedures. With this book and good laboratory techniques, you should have no problem acing the Unknowns.

Edition) Analytics: Business Intelligence, Algorithms and Statistical Analysis (Predictive Analytics, Data Visualization, Data Analytics, Business Analytics, Decision Analysis, Big Data, Statistical Analysis) Analytics: Data Science, Data Analysis and Predictive Analytics for Business (Algorithms, Business Intelligence, Statistical Analysis, Decision Analysis, Business Analytics, Data Mining, Big Data) Bundle: Calculus: Early Transcendentals, Loose-Leaf Version, 8th + WebAssign Printed Access Card for Stewart's Calculus: Early Transcendentals, 8th Edition, Multi-Term Counseling Research: Quantitative, Qualitative, and Mixed Methods (2nd Edition) (Merrill Counseling)