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This clearly written, class-tested manual has long given students hands-on experience covering all the essential topics in general chemistry. Stand alone experiments provide all the background introduction necessary to work with any general chemistry text. This revised edition offers new experiments and expanded information on applications to real world situations. Steve and Susan Zumdahl's texts focus on helping students build critical -thinking skills through the process of becoming independent problem-solvers. They help students learn to think like chemists so they can apply the problem solving process to all aspects of their lives. In this Second Edition of CHEMISTRY: AN ATOMS FIRST APPROACH, the Zumdahls use a meaningful approach that begins with the atom and proceeds through the concept of molecules, structure, and bonding, to more complex materials and their properties. Because this approach differs from what most students have experienced in high school courses, it encourages them to focus on conceptual learning early in the course, rather than relying on memorization and a plug and chug method of problem solving that even the best students can fall back on when confronted with familiar material. The atoms first organization provides an opportunity for students to use the tools of critical thinkers: to ask questions, to apply rules and models, and to evaluate outcomes. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. With the increasing focus on science education, growing attention is being paid to how science is taught. Educators in science and science-related disciplines are recognizing that distance delivery opens up new opportunities for delivering information, providing interactivity, collaborative opportunities and feedback, as well as for increasing access for students. This book presents the guidance of expert science educators from the US and from around the globe. They describe key concepts, delivery modes and emerging technologies, and offer models of practice. The book places particular emphasis on experimentation, lab and field work as they are fundamentally part of the education in most scientific disciplines. Chapters include: \* Discipline methodology and teaching strategies in the specific areas of physics, biology, chemistry and earth sciences. \* An overview of the important and appropriate learning technologies (ICTs) for each major science. \* Best practices for establishing and maintaining a successful course online. \* Insights and tips for handling practical components like laboratories and field work. \* Coverage of breaking topics, including MOOCs, learning analytics, open educational resources and m-learning. \* Strategies for engaging your students online. A companion website presents videos of the contributors sharing additional guidance, virtual labs simulations and various additional resources. While many of the core labs from the first edition have been retained, a renewed focus on the basics of chemistry and the scientific process create an even more detailed supplemental offering. This full-color, comprehensive, affordable manual is appropriate for two-semester introductory chemistry courses. It is loaded with clearly written exercises, critical thinking questions, and full-color illustrations and photographs, providing ample visual support for experiment set up, technique, and results. Exploring Chemical Analysis provides an ideal one-term introduction to analytical chemistry for students whose primary interests generally lie outside of chemistry. Combining coverage of all major analytical topics with effective problem-solving methods, it teaches students how to understand analytical results and how to use quantitative manipulations, preparing them for the problems they will encounter in fields from biology to chemistry to geology. Consistent Approach to Problem Solving By providing Test Yourself questions (which break down problem-solving to more elementary steps) at the end of each worked example, students can check their understanding of the concepts covered in each worked example. Integrated Spreadsheet Applications The text can be used without ever opening a spreadsheet application, but the early introduction of spreadsheets allows more flexibility. Problems marked with a spreadsheet icon denote problems that can be answered with a spreadsheet. Chapter Openers show the relevance of analytical chemistry to the real world and to other disciplines of science. New Applications through the book include: • solid-phase extraction for the measurement of caffeine • measuring the common cold virus with an imprinted polymer on a quartz crystal microbalance • a precipitation titration conducted on the Phoenix Mars Lander • updated classroom data from a saltwater aquarium • microdialysis in biological sampling, measuring pH of oceans and rivers by spectrophotometry with indicators • continued highlighting of the effects of increasing carbon dioxide in the air and ocean • a description of the lithium-ion battery • how perchlorate was discovered on Mars with ion-selective electrodes • protein immunosensing with solid-state ion-selective electrodes • X-ray photoemission from the peeling of tape • how a home pregnancy test works • laser-ablation atomic emission on Mars • lead isotopes in archaeology • bisphenol A in food containers • measuring trans fat in food with an ionic liquid gas chromatography stationary phase • chromated copper arsenate preservative in wood • preconcentration of trace elements from seawater • simultaneous separation of anions and cations • detecting contaminated heparin • DNA profiling with a lab on a chip New topics in this edition include: • The F test for comparison of variance is introduced early in the chapter on statistics. • The meaning of statistical hypothesis testing is explained with an example from epidemiology. • Propagation of uncertainty for pH is described. • New topics in liquid chromatography include ultra-performance liquid chromatography, superficially porous particles, hydrophilic interaction chromatography, a waveguide absorbance detector, and an illustration of the charged aerosol detector. • An improved diagram showing the working of an electronic balance and a photograph of the optical train of an ultraviolet-visible spectrophotometer are included. Updated instructions for Excel spreadsheets to Excel 2007. The Zumdahls' hallmark problem-solving approach and focus on conceptual development come to life in this new edition with interactive problems that promote active learning and visualization. Enhanced by a wealth of online support that is seamlessly integrated with the program, Chemistry's solid explanations, emphasis on modeling, and outstanding problem sets make both teaching and learning chemistry more meaningful and accessible than ever before. The authors emphasize a qualitative approach to chemistry in both the text and the technology program before quantitative problems are considered, helping to build comprehension. The emphasis on modeling throughout the narrative addresses the problem of rote memorization by helping students to better understand and appreciate the process of scientific development. By stressing the limitations and uses of scientific models, the authors show students how chemists think and work. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. Issues in Biochemistry and Geochemistry / 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Organic Geochemistry. The editors have built Issues in Biochemistry and Geochemistry: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Organic Geochemistry in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Biochemistry and Geochemistry: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>. Build skill and confidence in the lab with the 59 experiments included in this manual. Safety is strongly emphasized throughout the lab manual. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. With this modular laboratory program, students build skills using important chemical concepts and techniques to the point where they are able to design a solution to a scenario drawn from a professional environment. The scenarios are drawn from the lives of people who work with chemistry every day, ranging from field ecologists to chemical engineers, and include many health professionals as well. This new edition of the Beran lab manual emphasizes chemical principles as well as techniques. The manual helps students understand the timing and situations for the various techniques. The Beran lab manual has long been a market leading lab manual for general chemistry. Each experiment is presented with concise objectives, a comprehensive list of techniques, and detailed lab intros and step-by-step procedures. This laboratory manual is intended for a two-semester general chemistry course. The procedures are written with the goal of simplifying a complicated and often challenging subject for students by applying concepts to everyday life. This lab manual covers topics such as composition of compounds, reactivity, stoichiometry, limiting reactants, gas laws, calorimetry, periodic trends, molecular structure, spectroscopy, kinetics, equilibria, thermodynamics, electrochemistry, intermolecular forces, solutions, and coordination complexes. By the end of this course, you should have a solid understanding of the basic concepts of chemistry, which will give you confidence as you embark on your career in science. This fully updated Eighth Edition of CHEMICAL PRINCIPLES provides a unique organization and a rigorous but understandable introduction to chemistry that emphasizes conceptual understanding and the importance of models. Known for helping students develop a qualitative, conceptual foundation that gets them thinking like chemists, this market-leading text is designed for students with solid mathematical preparation. The Eighth Edition features a new section on Solving a Complex Problem that discusses and illustrates how to solve problems in a flexible, creative way based on understanding the fundamental ideas of chemistry and asking and answering key questions. The book is also enhanced by an increase of problem solving techniques in the solutions to the Examples, new student learning aids, new “Chemical Insights” and “Chemistry Explorers” boxes, and more. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. Stories from years of teaching high school chemistry. The in-lab preparation of certain chemical reagents provides a number of advantages over purchasing various commercially prepared samples. This is especially true in isolated regions where acquiring the necessary substances from overseas can cause undue delay and inconvenience due to restrictions on the transportation of hazardous chemicals. An invaluable resource for chemists in a variety of environments, Small-Scale Synthesis of Laboratory Reagents with Reaction Modeling presents efficient, sensible, and versatile methods for the laboratory preparation of common chemical reagents. Rapid, reliable synthesis Designed to facilitate smooth experimentation in the lab, this volume presents preparations chosen for their short duration, availability of apparatus, high yield, and high purity of the product. Adding an educational component, the book also discusses fundamental processes in inorganic chemistry, presenting original modeling of reactions and their practical implementation. Theoretical aspects are discussed to a greater extent than is usual in synthetic literature in cases where there is a direct impact on experimental parameters, such as the reaction time, yield, and purity of the product. More than 30 convenient, time-saving preparations Focusing on simple synthesis of high-purity reagents, the book contains over 30 presentations, a substantial number of which are mathematically modeled for the first time. Most syntheses can be carried out in one day using common laboratory equipment, making this volume a valuable and time-saving tool. For students, DIY hobbyists, and science buffs, who can no longer get real chemistry sets, this one-of-a-kind guide explains how to set up and use a home chemistry lab, with step-by-step instructions for conducting experiments in basic chemistry -- not just to make pretty colors and stinky smells, but to learn how to do real lab work: Purify alcohol by distillation Produce hydrogen and oxygen gas by electrolysis Smelt metallic copper from copper ore you make yourself Analyze the makeup of seawater, bone, and other common substances Synthesize oil of wintergreen from aspirin and rayon fiber from paper Perform forensics tests for fingerprints, blood, drugs, and poisons and much more From the 1930s through the 1970s, chemistry sets were among the most popular Christmas gifts, selling in the millions. But two decades ago, real chemistry sets began to disappear as manufacturers and retailers became concerned about liability. .em>The Illustrated Guide to Home Chemistry Experiments steps up to the plate with lessons on how to equip your home chemistry lab, master laboratory skills, and work safely in your lab. The bulk of this book consists of 17 hands-on chapters that include multiple laboratory sessions on the following topics: Separating Mixtures Solubility and Solutions Colligative Properties of Solutions Introduction to Chemical Reactions & Stoichiometry Reduction-Oxidation (Redox) Reactions Acid-Base Chemistry Chemical Kinetics Chemical Equilibrium and Le Chatelier's Principle Gas Chemistry Thermochemistry and Calorimetry Electrochemistry Photochemistry Colloids and Suspensions Qualitative Analysis Quantitative Analysis Synthesis of Useful Compounds Forensic Chemistry With plenty of full-color illustrations and photos, Illustrated Guide to Home Chemistry Experiments offers introductory level sessions suitable for a middle school or first-year high school chemistry laboratory course, and more advanced sessions suitable for students who intend to take the College Board Advanced Placement (AP) Chemistry exam. A student who completes all of the laboratories in this book will have done the equivalent of two full years of high school chemistry lab work or a first-year college general chemistry laboratory course. This hands-on introduction to real chemistry -- using real equipment, real chemicals, and real quantitative experiments -- is ideal for the many thousands of young people and adults who want to experience the magic of chemistry. Offers a choice of classic chemistry experiments and innovative ones. All of them place special emphasis on the biological implications of chemical concepts. Available for custom publishing at <http://custompub.whfreeman.com> Build skill and confidence in the lab with the 61 experiments included in this manual. Safety is strongly emphasized throughout the lab manual. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. This print companion to MindTap General Chemistry: Atoms First presents the narrative, figures, tables and example problems—but no graded problems or assessments. Students must use MindTap to complete the interactive activities, exercises, and assignments. The atoms first organization introduces students to atoms and molecules earlier and delays math-intensive problem-solving to later in the semester. This gives students a stronger conceptual framework to help them succeed in the course. In addition, the narrative provides greater emphasis on the historical development of the atomic nature of matter and atomic structure. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. EXPERIMENTS IN GENERAL CHEMISTRY, Sixth Edition, has been designed to stimulate curiosity and insight, and to clearly connect lecture and laboratory concepts and techniques. To accomplish this goal, an extensive effort has been made to develop experiments that maximize a discovery-oriented approach and minimize personal hazards and ecological impact. Like earlier editions, the use of chromates, barium, lead, mercury, and nickel salts has been avoided. The absence of these hazardous substances should minimize disposal problems and costs. This lab manual focuses not only on what happens during chemical reactions, but also helps students understand why chemical reactions occur. The sequence of experiments has been refined to follow topics covered in most general chemistry textbooks. In addition, Murov has included a correlation chart that links the experiments in the manual to the corresponding chapter topics in several Cengage Learning general chemistry titles. Each experiment--framed by pre- and post-laboratory exercises and concluding thought-provoking questions--helps to enhance students' conceptual understanding. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. The manual contains laboratory experiments written specifically for the prep-chem lab, as well as for the general chemistry course. Available as a complete manual or custom published at<http://custompub.whfreeman.com>. This General Chemistry Lab Manual by Bowman can be used by colleges, Agricultural Technical Institutes or high schools. Includes: Experiment 1: Observations/Classifications; Experiment 2: Balances, Weighing and Density; Experiment 3: Atomic Structure Worksheet; Experiment 4: Physical and Chemical Change; Experiment 5: Bonding Worksheet; Experiment 6: Stoichiometry; Experiment 7: Solutions; Experiment 8: Equilibrium; Experiment 9: Ion Exchange; Experiment 10: Acides and Bases and Experiment 11: Oxidation and Reduction. The laboratory course described in the lab manual emphasizes experimental design, data analysis, and problem solving. Inherent in the design is the emphasis on communication skills, both written and oral. Students work in groups on open-ended projects in which they are given an initial scenario and then asked to investigate a problem. There are no formalized instructions and students must plan and carry out their own investigations. Students can't do chemistry if they can't do the math. The Practice of Chemistry, First Edition is the only preparatory chemistry text to offer students targeted consistent mathematical support to make sure they understand how to use math (especially algebra) in chemical problem solving. The book's unique focus on actual chemical practice, extensive study tools, and integrated media, makes The Practice of Chemistry the most effective way to prepare students for the standard general chemistry course--and bright futures as science majors. This special PowerPoint® tour of the text was created by Don Wink:[http://www.bfwpub.com/pdfs/wink/POCPowerPoint\\_Final.ppt\(832KB\)](http://www.bfwpub.com/pdfs/wink/POCPowerPoint_Final.ppt(832KB)) Solutions to stoichiometry and conservation of mass problems. Laboratory exercises. The acknowledged leader and standard in general chemistry, this book maintains its effective and proven features—clarity of writing, scientific integrity, currency, strong exercises, visual emphasis and consistency in presentation. It offers readers an integrated educational solution to the challenges of the learning with an expanded media program that works in concert with the book, helping them to approach problem solving, visualization, and applications with greater success.Chapter topics cover: Matter and Measurement; Atoms, Molecules, and Ions; Stoichiometry: Calculations with Chemical Formulas and Equations; Aqueous Reactions and Solution Stoichiometry; Thermochemistry; Electronic Structure of Atoms; Periodic Properties of the Elements; Basic Concepts of Chemical Bonding; Molecular Geometry and Bonding Theories; Gases; Intermolecular Forces, Liquids, and Solids; Modern Materials; Properties of Solutions; Chemical Kinetics; Chemical Equilibrium; Acid-Base Equilibria; Additional Aspects of Equilibria; Chemistry of the Environment; Chemical Thermodynamics; Electrochemistry; Nuclear Chemistry; Chemistry of the Nonmetals; Metals and Metallurgy; Chemistry of Coordination Compounds; and The Chemistry of Life: Organic and Biological Chemistry.For individuals interested in the study of general chemistry. CHEMISTRY allows the reader to learn chemistry basics quickly and easily by emphasizing a thoughtful approach built on problem solving. For the Eighth Edition, authors Steven and Susan Zumdahl have extended this approach by emphasizing problem-solving strategies within the Examples and throughout the text narrative. CHEMISTRY speaks directly to the reader about how to approach and solve chemical problems—to learn to think like a chemist—so that they can apply the process of problem-solving to all aspects of their lives. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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