



# Chemistry and Materials Science

Springer and Palgrave Essential Textbooks

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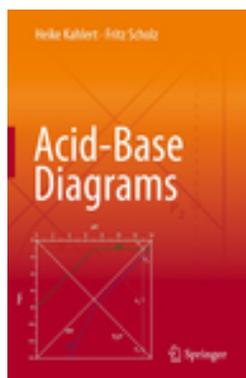
15-17 Tiergartenstrasse

Heidelberg 69121

Germany

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ISBN : 978-3-642-37901-7

Kahlert, Heike, Scholz, Fritz, University of Greifswald, Greifswald, Germany

## Acid-Base Diagrams

- The first textbook focusing on fundamentals and application of acid-base diagrams
- In-depth yet simple presentation
- Full-color diagrams throughout

Understanding acid-base equilibria made easy for students in chemistry, biochemistry, biology, environmental and earth sciences. Solving chemical problems, be it in education or in real life, often requires the understanding of the acid-base equilibria behind them. Based on many years of teaching experience, Heike Kahlert and Fritz Scholz present a powerful tool to meet such challenges. They provide a simple guide to the fundamentals and applications of acid-base diagrams, avoiding complex mathematics. This textbook is richly illustrated and has full color throughout. It offers learning features such as boxed results and a collection of ...

### Contents

The math behind the pH-logci diagrams.- Constructing pH-logci diagrams.- The application of pH-logci diagrams for graphical estimation of the pH of solutions and for the derivation of simplified equations.- The use of pH-logci diagrams for the construction of titration diagrams.- Titration errors.

### Fields of Interest

Analytical Chemistry; Biochemistry, general; Environmental Chemistry; Inorganic Chemistry; Physical Chemistry; Geochemistry

### Content Level

Upper undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

2013,X, 136 p. 104 illus., 78 illus. in color.

Hardcover

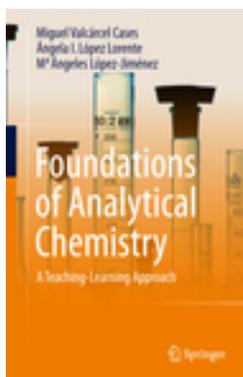
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-319-62871-4

Valcárcel Cases, M., López-Lorente, Á.I., López-Jiménez, M.Á., University of Córdoba, Córdoba, Spain

## Foundations of Analytical Chemistry

### A Teaching-Learning Approach

- Includes 250 slides summarizing basic concepts
- Written by the DAC-EuCheMS-Awardee 2015 together with an undergraduate student
- Supports the teaching-learning process in a unique way

This book offers a completely new approach to learning and teaching the fundamentals of analytical chemistry. It summarizes 250 basic concepts of the field on the basis of slides. Each of the nine chapters offers the following features: • Introduction: Summary. General scheme. Teaching objectives. • Text containing the explanation of each slide. • Recommended and commented bibliography. • Questions to be answered. • Slides. A distinct feature of this novel book is its focus on the fundamental concepts and essential principles of analytical chemistry, which sets it apart from other books presenting ...

### Contents

1.Principles of Analytical Chemistry.- 2.Analytical properties.- 3.Traceability: Reference materials.- 4.Generalities of the analytical process.- 5.Quantitative analytical processes.- 6.Qualitative analytical processes.-

### Fields of Interest

Analytical Chemistry; Monitoring/ Environmental Analysis; Characterization and Evaluation of Materials; Biochemistry, general; Pharmacology/Toxicology

### Content Level

Lower undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

1st ed. 2018,XVII, 487 p. 346 illus., 345 illus. in color. With online files/update. Hardcover

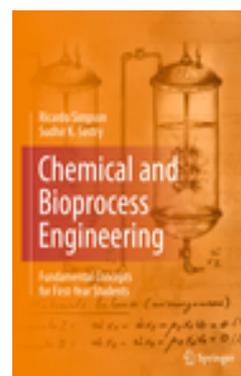
### Medium Type

Book w. online files / update

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4614-9125-5

Simpson, Ricardo, Sastry, Sudhir K., Universidad Técnica Federico Santa María, Valparaíso, Chile

## Chemical and Bioprocess Engineering

### Fundamental Concepts for First-Year Students

- A unique introductory textbook that covers both chemical and bioprocess engineering
- Provides a thorough grounding in fundamental concepts
- Contains more than 400 exercises

The goal of this textbook is to provide first-year engineering students with a firm grounding in the fundamentals of chemical and bioprocess engineering. However, instead of being a general overview of the two topics, Fundamentals of Chemical and Bioprocess Engineering will identify and focus on specific areas in which attaining a

solid competency is desired. This strategy is the direct result of studies showing that broad-based courses at the freshman level often leave students grappling with a lot of material, which results in a low rate of retention. Specifically, strong emphasis will be placed on the topic of material balances, with the ...

### Contents

Introduction.- Fundamentals of Magnitudes, Units Systems, and Their Applications in Process Engineering.- Fundamentals of Process Control, Communication, and Instrumentation.- Learning from Nature and its Applications in Chemical and Bioprocess Engineering.- Challenging and Solving Problems with Basic Tools, Testing Student's Attitude.- A Glimpse of Thermodynamics and Transport Phenomena.- Fundamentals of Material Balances (Non-reactive Systems).- Fundamentals of Material Balances (Reactive Systems).- Fundamentals of Mathematical Modeling, Simulation, and Process Control.- Scale Up in Chemical and Bioprocess Engineering.- Optimization and ...

### Fields of Interest

Biochemical Engineering; Food Science; Engineering Thermodynamics, Heat and Mass Transfer; Mathematical Modeling and Industrial Mathematics

### Content Level

Lower undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

2013,XX, 352 p. 208 illus., 84 illus. in color. Hardcover

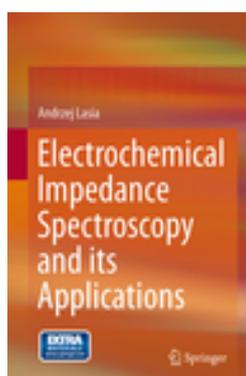
### Medium Type

Book

### Imprint

Springer

Order Quantity



ISBN : 978-1-4614-8932-0

Lasia, Andrzej, Université de Sherbrooke, Sherbrooke, QC

## Electrochemical Impedance Spectroscopy and its Applications

- Only comprehensive recent book on EIS to present applications and theory to students
- Includes numerous exercises and examples
- Presents a systematic overview of EIS

This book presents a complete overview of the powerful but often misused technique of Electrochemical Impedance Spectroscopy (EIS). The book presents a systematic and complete overview of EIS. The book carefully describes EIS and its application in studies of electrocatalytic reactions and other electrochemical processes of practical interest. This book is directed towards graduate students and researchers in Electrochemistry. Concepts are illustrated through detailed graphics and numerous examples. The book also includes practice problems. Additional materials and solutions are available online.

### Contents

Introduction.- 1: Definition of Impedance and Impedance of Electrical Circuits.- 2: Definition of Impedance and Impedance of Electrical Circuits.- 3: Determination of Impedances.- 4: Impedance of the Faradaic Reactions in the Presence of Mass Transfer.- 5: Impedance of the Faradaic Reactions in the Presence of Adsorption.- 6: General Method of Obtaining Impedance of Complex Reactions.- 7: Electrocatalytic Reactions Involving Hydrogen.- 8: Dispersion of Impedances at Solid Electrodes.- 9: Impedance of Porous Electrodes.- 10: Semiconductors and Mott-Schottky Plots.- 11: Coatings and Paints.- 12: Self-Assembled Monolayers, Biological Membranes, ...

### Fields of Interest

Electrochemistry; Spectroscopy/Spectrometry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2014,XIII, 367 p. 224 illus., 48 illus. in color. Hardcover

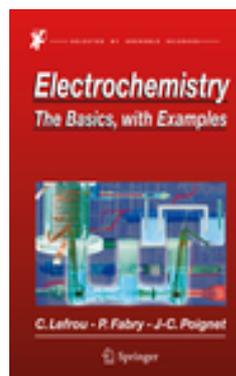
### Medium Type

Book

### Imprint

Springer

Order Quantity



ISBN : 978-3-642-30249-7

Lefrou, C., Fabry, P., Poignet, J.-C., LEPMI, Saint Martin d'Heres cedex, France

## Electrochemistry

### The Basics, With Examples

- A two level approach with a first level providing a smooth introduction to the subject and a second level providing a more in depth coverage of the topic
- Problems and solutions included
- A breadth of topics including electrochemistry in liquid and solid systems

This textbook offers original and new approaches to the teaching of electrochemical concepts, principles and applications. Throughout the text the authors provide a balanced coverage of the thermodynamic and kinetic processes at the heart of electrochemical systems. The first half of the book outlines fundamental concepts appropriate to undergraduate students and the second half gives an in-depth account of electrochemical systems suitable for experienced scientists and course lecturers. Concepts are clearly explained and mathematical treatments are kept to a minimum or reported in appendices. This book features: - Questions and answers for ...

### Contents

Chapter 1: Basic notions.- Chapter 2: Simplified description of electrochemical systems.- Chapter 3: Thermodynamic features.- Chapter 4: Current flow: a non-equilibrium process

### Fields of Interest

Electrochemistry; Energy Storage; Optical and Electronic Materials; Thermodynamics; Electrical Engineering

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2012,XVI, 353 p. Hardcover

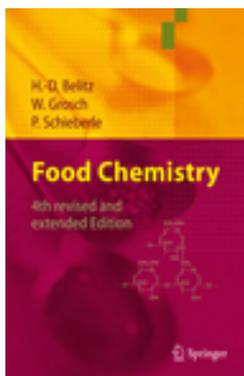
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-540-69933-0

Belitz, H.-D., Grosch, W., Schieberle, P., Heidelberg, Germany

## Food Chemistry

- Bestselling textbook now in its fourth, revised and enlarged edition
- New topics covered include BSE detection and acrylamide
- More extensively treated are food allergies, alcoholic Drinks, or phytosterols

For more than two decades, this work has remained the leading advanced textbook and easy-to-use reference on food chemistry and technology. Its fourth edition has been extensively re-written and enlarged, now also covering topics such as BSE detection or acrylamide. Food allergies, alcoholic drinks, or phytosterols are now treated more extensively. Proven features of the prior editions are maintained: Contains more than 600 tables, almost 500 figures, and about 1100 structural formulae of food components - Logically organized according to food constituents and commodities - Comprehensive subject index. These features provide students and ...

### Contents

Water.- Amino Acids, Peptides, Proteins.- Enzymes.- Lipids.- Carbohydrates.- Aroma Compounds.- Vitamins.- Minerals.- Food Additives.- Food Contamination.- Milk and Dairy Products.- Eggs.- Meat.- Fish, Whales,

Crustaceans, Mollusks.- Edible Fats and Oils.- Cereals and Cereal Products.- Legumes.- Vegetables and Vegetable Products.- Fruits and Fruit Products.- Sugars, Sugar Alcohols and Honey.- Alcoholic Beverages.- Coffee, Tea, Cocoa.- Spices, Salt and Vinegar.- Drinking Water, Mineral and Table Water.

### Fields of Interest

Food Science; Agriculture; Analytical Chemistry; Biochemistry, general; Nutrition

### Content Level

Professional/practitioner

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

4th revised and extended ed. 2009,XLIV, 1070 p. With 923 Formulas. Hardcover

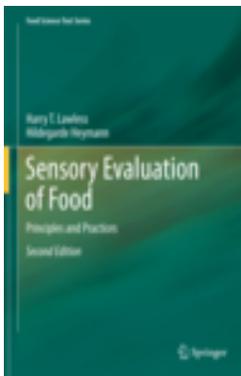
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4419-6487-8

Lawless, Harry T., Heymann, Hildegard, Cornell University, Ithaca, USA

## Sensory Evaluation of Food

### Principles and Practices

- The first volume of this book, which has not been updated since 1998, still remains a classroom and research favorite. Sensory evaluation is a required class for any Food Science undergraduate major, and this has served for nearly a decade as one of the only texts. Comprehensive in scholarship and represents divergent philosophies in the field in a balanced manner

The field of sensory science has grown

exponentially since the publication of the previous version of this work. Fifteen years ago the journal Food Quality and Preference was fairly new. Now it holds an eminent position as a venue for research on sensory test methods (among many other topics). Hundreds of articles relevant to sensory testing have appeared in that and in other journals such as the Journal of Sensory Studies. Knowledge of the intricate cellular processes in chemoreception, as well as their genetic basis, has undergone nothing less than a revolution, culminating in the award of the Nobel Prize to Buck and Axel in 2004 for their ...

### Contents

Physiological and Psychological Foundations of Sensory Function.- Principles of Good Practice.- Discrimination Testing.- Similarity, Equivalence Testing, and Discrimination Theory.- Measurement of Sensory Thresholds.- Scaling.- Time-Intensity Methods.- Context Effects and Biases in Sensory Judgment.- Descriptive Analysis.- Texture Evaluation.- Color and Appearance.- Preference Testing.- Acceptance Testing.- Consumer Field Tests and Questionnaire Design.- Qualitative Consumer Research Methods.- Quality Control and Shelf-Life (Stability) Testing.- Data Relationships and Multivariate Applications.- Strategic Research.- Erratum to: Similarity, ...

### Fields of Interest

Food Science; Neurochemistry; Receptors

### Content Level

Upper undergraduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2nd ed. 2010,XXIII, 596 p.(Food Science Text Series) Hardcover

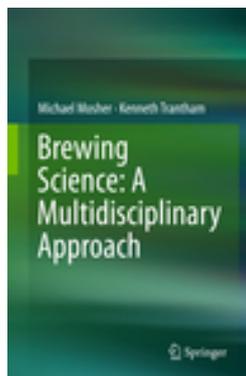
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-319-46393-3

Mosher, Michael, Trantham, Kenneth, Department of Chemistry and Biochemistry, Greely, CO

## Brewing Science: A Multidisciplinary Approach

- Provides a comprehensive and detailed overview of each step in the Brewing process from the initial definition of beer through all stages of the brewing process to the packaging of the final product, designed for Introduction to Brewing Science courses
- Delivers a thorough introduction to the chemistry of beer, including organic chemistry, reaction chemistry and molecular representation, with a focus on reactions and control through the brewing process
- Presents text and laboratory exercises designed to grant students the ability to conduct important brewing analysis and pass relevant certificate course examinations in the field

This text finally collects all the introductory aspects of beer brewing science into one place for undergraduate brewing science courses. This expansive and detailed work is written in conversational style, walking students through all the brewing basics from the origin and history of beer to the brewing process to post-brew packaging and quality control and assurance. As an introductory text, this book assumes the reader has no prior knowledge of brewing science and only limited experience with chemistry, biology and physics. The text provides students with all the necessary details of brewing science using a multidisciplinary approach, ...

### Contents

Introduction to Brewing Science.- Beer Styles.- Molecules and Other Matters.- Overview of the Brewing Process.- The Food for the Brew.- Mashing.- Sparging.- Wort Boiling.- Cooling and Fermenting.- Conditioning.- Packaging.- Quality Assurance and Quality Control.- Appendix A.- Appendix B.

### Fields of Interest

Food Science; Organic Chemistry

### Content Level

Upper undergraduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

1st ed. 2017,XIII, 408 p. 176 illus., 104 illus. in color. Hardcover

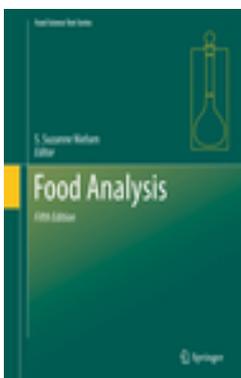
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-3-319-45774-1

Nielsen, S. Suzanne (Ed.), Purdue University, West Lafayette, IN, USA

## Food Analysis

- New edition of well-known textbook
- Invaluable reference for professionals in industry
- Teaching materials available via editor

This fifth edition provides information on techniques needed to analyze foods for chemical and physical properties. The book is ideal for undergraduate courses in food analysis and is also an invaluable reference to professionals in the food industry. General information chapters on regulations, labeling, sampling, and data handling provide background information for chapters on specific methods to determine chemical composition and characteristics, physical properties, and objectionable matter and constituents. Methods of analysis covered include information on the basic principles, advantages, limitations, and applications. Sections on ...

### Contents

Introduction to Food Analysis.- United States Government Regulations and International

Standards Related to Food Analysis.- Nutrition Labeling.- Evaluation of Analytical Data Sampling and Sample Preparation.- Basic Principles of Spectroscopy.- Ultraviolet, Visible, and Fluorescence Spectroscopy.- Infrared and Raman Spectroscopy.- Atomic Absorption Spectroscopy, Atomic Emission Spectroscopy, and Inductively Coupled Plasma-Mass Spectrometry.- Nuclear Magnetic Resonance.- Mass Spectrometry.- Basic Principles of Chromatography.- High Performance Liquid Chromatography.- Gas Chromatography.- Moisture and Total Solids Analysis.- Ash Analysis.- Fat ...

### Fields of Interest

Food Science; Industrial Chemistry/Chemical Engineering; Spectroscopy/Spectrometry

### Content Level

Research

### Product category

Undergraduate textbook

Available

### Bibliography

5th ed. 2017,XX, 649 p. 326 illus., 99 illus. in color.(Food Science Text Series) Hardcover

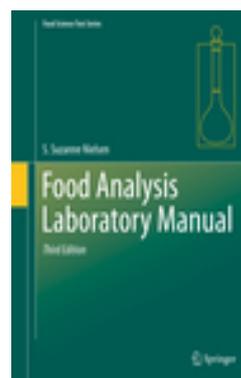
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-3-319-44125-2

Nielsen, S. Suzanne, Purdue University, West Lafayette, IN, USA

## Food Analysis Laboratory Manual

- 24 laboratory exercises to accompany Food Analysis textbook
- Multiple sections covering several methods of analysis

- Uniformly structured exercises for consistent learning

This third edition laboratory manual was written to accompany Food Analysis, Fifth Edition, by the same author. New to this third edition of the laboratory manual are four introductory chapters that complement both the textbook chapters and the laboratory exercises. The 24 laboratory exercises in the manual cover 21 of the 35 chapters in the textbook. Many of the laboratory exercises have multiple sections to cover several methods of analysis for a particular food component or characteristic. Most of the laboratory exercises include the following: background, reading assignment, objective, principle of method, chemicals, reagents, ...

### Contents

Laboratory Standard Operating Procedures.- Preparation of Reagents and Buffers.- Dilution and Concentration Calculations.- Use of Statistics in Food Analysis.- Nutritional Labeling Using a Computer Program.- Accuracy and Precision Assessment.- High Performance Liquid Chromatography.- Gas Chromatography.- Mass Spectrometry with High Performance Liquid Chromatography.- Moisture Content Determination.- Ash Content Determination.- Protein Nitrogen Determination.- Total Carbohydrate by Phenol-Sulfuric Acid Method.- Vitamin C Determination by Indophenol Method.- Water Hardness Testing by Complexometric Determination of ...

### Fields of Interest

Food Science; Industrial Chemistry/Chemical Engineering; Spectroscopy/Spectrometry

### Content Level

Upper undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

3rd ed. 2017,XI, 249 p. 330 illus., 96 illus. in color.(Food Science Text Series) Softcover

### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4614-9137-8

Vaclavik, Vickie A., Christian, Elizabeth W., University of Texas Southwestern Medical Center, Dallas, TX, USA

### Essentials of Food Science

- Uses Choose My Plate, the new health guidelines from the USDA
- Major updates to chapters on food processing
- An important tool for students of nutrition and dietetics

The fourth edition of this classic text continues to use a multidisciplinary approach to expose the non-major food science student to the physical and chemical composition of foods. Additionally, food preparation and processing, food safety, food chemistry, and food technology applications are discussed in this single source of information. The book begins with an Introduction to Food Components, Quality and Water. Next, it addresses Carbohydrates in Food, Starches, Pectins and Gums. Grains: Cereals, Flour, Rice and Pasta, and Vegetables and Fruits follow. Proteins in Food, Meat, Poultry, Fish, and Dry Beans; Eggs and Egg Products, Milk and ...

### Contents

Part I. Introduction to Food Components.- Evaluation of Food Quality.- Water.- Part II. Carbohydrates in Food.- Carbohydrates in Food: An Introduction.- Starches in Food.- Pectins and Gums.- Grains: Cereals, Flour, Rice, and Pasta.- Vegetables and Fruits.- Part III. Proteins in Food.- Proteins in Foods: An Introduction.- Meat, Poultry, Fish, and Dry Beans.- Eggs and Egg Products.- Milk and Milk Products.- Part IV. Fats in Food.- Fats and Oils in Products.- Food Emulsions and Foams.- Part V. Sugars, Sweeteners.- Sugars, Sweeteners, and Confections.- Part VI. Baked Products.- Baked Products: Batters and Dough.- Part VII. Aspects of Food ...

### Fields of Interest

Food Science

### Content Level

Lower undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

4th ed. 2014,XXIV, 495 p. 136 illus., 42 illus. in color.(Food Science Text Series) Softcover

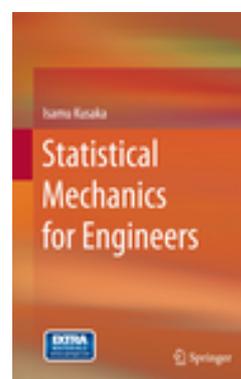
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-319-13809-1

Kusaka, Isamu, The Ohio State University, Columbus, OH, USA

### Statistical Mechanics for Engineers

- Statistical mechanics developed for chemical engineers
- Statistical mechanics developed largely without quantum mechanics, but a summary of the relevant quantum mechanics included
- Well-organized summary of thermodynamics

This book provides a gentle introduction to equilibrium statistical mechanics. The particular aim is to fill the needs of readers who wish to learn the subject without a solid background in classical and quantum mechanics. The approach is unique in that classical mechanical formulation takes center stage. The book will be of particular interest to advanced undergraduate and graduate students in engineering departments.

### Contents

Classical Mechanics.- Thermodynamics.- Classical Statistical Mechanics.- Various Statistical Ensembles.- Simple Models of Adsorption.- Thermodynamics of Interface.- Statistical Mechanics of Inhomogeneous Fluids.- Quantum Formulation.- Vectors in

3-Dimensional Space.- Useful Formulae.- Legendre Transformation.- Dirac Function.- Where to Go from Here.- List of Greek Letters.- Hints to Selected Exercises.- Index.

### Fields of Interest

Industrial Chemistry/Chemical Engineering; Theoretical and Computational Chemistry; Complex Systems; Engineering Thermodynamics, Heat and Mass Transfer; Statistical Physics and Dynamical Systems

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

1st ed. 2015, XIX, 447 p. 97 illus. Hardcover

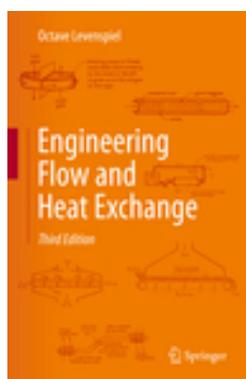
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-1-4899-7453-2

Levenspiel, Octave, Oregon State University, Corvallis, OR, USA

## Engineering Flow and Heat Exchange

- Numerous practical examples of heat transfer
- Different from other introductory books on fluids
- Clearly written, simple to understand, written for students to absorb material quickly

The third edition of Engineering Flow and Heat Exchange is the most practical textbook available on the design of heat transfer and equipment. This book is an excellent

introduction to real-world applications for advanced undergraduates and an indispensable reference for professionals. The book includes comprehensive chapters on the different types and classifications of fluids, how to analyze fluids, and where a particular fluid fits into a broader picture. This book includes various a wide variety of problems and solutions – some whimsical and others directly from industrial applications. Numerous practical examples of heat transfer ...

### Contents

Basic Equations for Flowing Streams.- Flow of Incompressible Newtonian Fluids in Pipes.- Compressible Flow of Gases.- Molecular Flow .-Non-Newtonian Fluids.- Flow Through Packed Beds.- Flow in Fluidized Beds.- Solid Particles Falling Through Fluids.- The Three Mechanisms of Heat Transfer: Conduction, Convection, and Radiation.- Combination of Heat Transfer Resistances.- Unsteady-state Heating and Cooling of Solid Objects.- Introduction to Heat Exchangers.- Recuperators: Through-the-Wall, Nonstoring Exchangers.- Direct-Contact Gas-Solid Nonstoring Exchangers.- Heat Regenerators: Direct-Contact Heat Storing Exchangers Using a Batch of Solids.- ...

### Fields of Interest

Industrial Chemistry/Chemical Engineering; Engineering Thermodynamics, Heat and Mass Transfer; Engineering Fluid Dynamics; Mechanical Engineering; Thermodynamics

### Content Level

Upper undergraduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

3rd ed. 2014, XXIV, 398 p. 311 illus. Hardcover

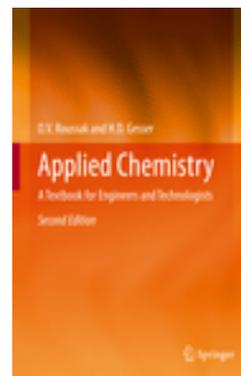
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-1-4614-4261-5

Roussak, Oleg, Gesser, H. D., University of Manitoba, Winnipeg, Canada

## Applied Chemistry

### A Textbook for Engineers and Technologists

- No competing book treats the Engineering aspects of Physical Chemistry in terms of Engineering design and function
- Step-by-step laboratory experiments and problems to be placed online
- Edition has newest, up-to-date and previously uncovered material

The second edition of Gesser's classic Applied Chemistry includes updated versions of the original 16 chapters plus two new chapters on semiconductors and nanotechnology. This textbook introduces chemistry students to the applications of their field to engineering design and function across a wide range of subjects, from fuels and polymers to electrochemistry and water treatment. Each chapter concludes with a reading list of relevant books and articles as well as a set of exercises which include problems that extend the topics beyond the text. Other supplements to the text include a laboratory section with step-by-step experiments and a ...

### Contents

Energy: An overview.- Solid fuels.- Crude oil.- Liquid fuels.- Alternate fuels.- Gaseous fuels.- Nuclear energy.- Lubrication and lubricants.- Electrochemistry, batteries and fuel cells.- Corrosion.- Polymers and plastics.- Adhesives and adhesion.- Paint and coatings.- Explosives.- Water.- Carbon-based polymers, activate carbons.- Cement, ceramics, and composites.- Semiconductors and nanotechnology.- Epilogue.

### Fields of Interest

Industrial Chemistry/Chemical Engineering; Physical Chemistry; Renewable and Green Energy; Characterization and Evaluation of Materials

### Content Level

Graduate

**Product category**

Graduate/advanced undergraduate textbook

Available

**Bibliography**

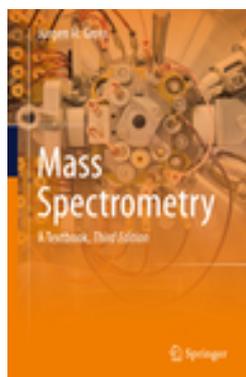
2nd ed. 2013,XXIV, 372 p. Hardcover

**Medium Type**

Book

**Imprint**

Springer

[Order Quantity](#)

ISBN : 978-3-319-54397-0

Gross, Jürgen H, Universität Heidelberg Organisch-Chemisches Inst., Heidelberg, Germany

**Mass Spectrometry****A Textbook**

- Now even more richly illustrated than before, including one third of figures in color
- New didactical features: flow charts, bulleted enumerations, concise chapter summaries, attractive layout
- Extended coverage of time-of-flight analyzers as well as miniaturisation

This third edition of the highly successful textbook, acclaimed for its comprehensiveness, accuracy, and excellent illustrations and photographs now comes with updated coverage plus numerous didactical improvements: The number of figures has notably increased, with about one third of them now presented in color. More photographs and schematics make it easier to understand and provide valuable insights into the practical aspects of instrumentation and procedures. Flow charts describe procedures and approaches to mass spectral interpretation and aid in decision making. Bulleted enumerations offer a quick overview wherever several features, ...

**Contents**

Introduction.- Principles of Ionization and Ion

Dissociation.- Isotopic Composition and Accurate Mass.- Instrumentation.- Practical Aspects of Electron Ionization.- Fragmentation of Organic Ions and Interpretation of EI Mass Spectra.- Chemical Ionization.- Field Ionization and Field Desorption.- Tandem Mass Spectrometry.- Fast Atom Bombardment.- Matrix-Assisted Laser Desorption/Ionization.- Electrospray Ionization.- Ambient Mass Spectrometry.- Hyphenated Methods.- Inorganic Mass Spectrometry.

**Fields of Interest**

Mass Spectrometry; Proteomics; Pharmacology/Toxicology; Monitoring/Environmental Analysis; Organic Chemistry; Forensic Science

**Content Level**

Upper undergraduate

**Product category**

Graduate/advanced undergraduate textbook

Available

**Bibliography**

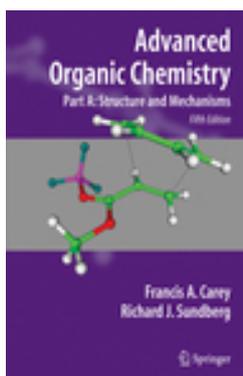
3rd ed. 2017,XXV, 968 p. 664 illus., 201 illus. in color. Hardcover

**Medium Type**

Book

**Imprint**

Springer

[Order Quantity](#)

ISBN : 978-0-387-44897-8

Carey, Francis A., Sundberg, Richard J., University of Virginia Dept. Chemistry, Charlottesville, VI, USA

**Advanced Organic Chemistry****Part A: Structure and Mechanisms**

- Parts A and B may stand alone; together, they provide a comprehensive foundation for study in organic chemistry
- Updated material reflecting scientific

advances since 2001's Fourth Edition, especially in computational chemistry

- Companion Websites provide digital models for students and exercise solutions for instructors

Since its original appearance in 1977, Advanced Organic Chemistry has maintained its place as the premier textbook in the field, offering broad coverage of the structure, reactivity and synthesis of organic compounds. As in the earlier editions, the text contains extensive references to both the primary and review literature and provides examples of data and reactions that illustrate and document the generalizations. While the text assumes completion of an introductory course in organic chemistry, it reviews the fundamental concepts for each topic that is discussed. The two-part fifth edition has been substantially revised and reorganized ...

**Contents**

1: Chemical Bonding and Molecular Structure.- 2: Stereochemistry, Conformation, and Stereoselectivity.- 3: Structural Effects on Stability and Reactivity.- 4: Nucleophilic Substitution.- 5: Polar Addition and Elimination Reactions.- 6: Carbanions and Other Carbon Nucleophiles.- 7: Addition, Condensation and Substitution Reactions of Carbonyl Compounds.- 8: Aromaticity.- Aromatic Substitution.- 9: Concerted Pericyclic Reactions.- 10: Free Radical Reactions.- 11: Photochemistry.

**Fields of Interest**

Organic Chemistry; Physical Chemistry; Medicinal Chemistry

**Content Level**

Graduate

**Product category**

Graduate/advanced undergraduate textbook

Available

**Bibliography**

5th ed. 2007,XXI, 1199 p.(Part A: Structure and Mechanisms) Hardcover

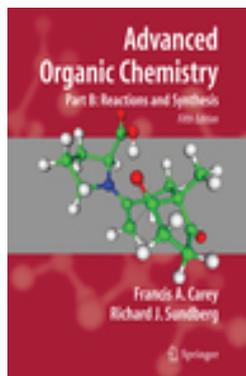
**Medium Type**

Book

**Imprint**

Springer

[Order Quantity](#)



ISBN : 978-0-387-68354-6

Carey, Francis A., Sundberg, Richard J., University of Virginia Dept. Chemistry, Charlottesville, VI, USA

## Advanced Organic Chemistry

### Part B: Reaction and Synthesis

• Parts A and B may stand alone; together, they provide a comprehensive foundation for study in organic chemistry Updated material reflecting scientific advances since 2001's Fourth Edition, especially in computational chemistry Companion Websites provide digital models for students and exercise solutions for instructors

Since its original appearance in 1977, Advanced Organic Chemistry has maintained its place as the premier textbook in the field, offering broad coverage of the structure, reactivity and synthesis of organic compounds. As in the earlier editions, the text contains extensive references to both the primary and review literature and provides examples of data and reactions that illustrate and document the generalizations. While the text assumes completion of an introductory course in organic chemistry, it reviews the fundamental concepts for each topic that is discussed. The two-part fifth edition has been substantially revised and reorganized ...

### Contents

Alkylation of Enolates and Other Carbon Nucleophiles.- Reactions of Carbon Nucleophiles with Carbonyl Compounds.- Functional Group Interconversion by Substitution, Including Protection and Deprotection.- Electrophilic Additions to Carbon-Carbon Multiple Bonds.- Reduction of Carbon-Carbon Multiple Bonds, Carbonyl Groups, and Other Functional Groups.- Concerted Cycloadditions, Unimolecular Rearrangements, and Thermal Eliminations.- Organometallic Compounds of Group I and II Metals.- Reactions Involving Transition Metals.- Carbon-Carbon Bond-Forming Reactions of Compounds of Boron, Silicon, and Tin.- Reactions Involving Carbocations, Carbenes, ...

### Fields of Interest

Organic Chemistry; Pharmacy; Medicinal

Chemistry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

5th ed. 2007,XXX, 1321 p.(Part B: Reactions and Synthesis) Softcover

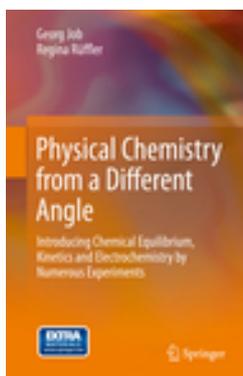
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-3-319-15665-1

Job, Georg, Ruffler, Regina, Job Foundation, Hamburg, Germany

## Physical Chemistry from a Different Angle

### Introducing Chemical Equilibrium, Kinetics and Electrochemistry by Numerous Experiments

- An introductory text with a highly innovative approach
- Uses chemical potential and entropy as key concepts
- Provides an almost intuitive understanding of physical chemistry

Learning the basics of physical chemistry with a unique, innovative approach. Georg Job and Regina Rueffler introduce readers to an almost intuitive understanding of the two fundamental concepts, chemical potential and entropy. Avoiding complex mathematics, these concepts are illustrated with the help of numerous demonstration experiments. Using these concepts, the subjects of chemical equilibria, kinetics and electrochemistry are

presented at an undergraduate level. The basic quantities and equations necessary for the qualitative and quantitative description of chemical transformations are introduced by using everyday experiences and ...

### Contents

Introduction and First Basic Concepts.- Energy.- Entropy and Temperature.- Chemical Potential.- Influence of Temperature and Pressure on Chemical Transformations.- Concentration Dependence of Chemical Potential.- Consequences of Mass Action: Acid-Base Reactions.- Side Effects of Transformations of Substances.- Coupling.- Molecular-Kinetic View of Dilute Gases.- Substances with Higher Density.- Spreading of Substances.- Homogeneous and Heterogeneous Mixtures.- Binary Systems.- Interfacial Phenomena.- Basic Principles of Kinetics.- Composite Reactions.- Theory of Rate of Reaction.- Catalysis.- Transport Phenomena.- Electrolyte Solutions.- ...

### Fields of Interest

Physical Chemistry; Thermodynamics

### Content Level

Upper undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

1st ed. 2016,XXI, 641 p. 1076 illus. With online files/update. Hardcover

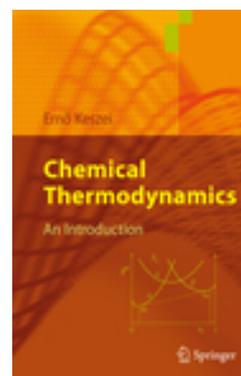
### Medium Type

Book w. online files / update

### Imprint

Springer

### Order Quantity



ISBN : 978-3-642-19863-2

Keszei, Ernő, Eötvös Loránd University (ELTE) Dept. Physical Chemistry, Budapest, Hungary

## Chemical Thermodynamics

### An Introduction

- Eminently suitable as a required textbook comprising complete material for or an undergraduate chemistry major course in chemical thermodynamics
- Clearly explains details of formal derivations that students can easily follow and so master applied mathematical operations
- Offers problems and solutions at the end of each chapter for self-test and self- or group study

This course-derived undergraduate textbook provides a concise explanation of the key concepts and calculations of chemical thermodynamics. Instead of the usual 'classical' introduction, this text adopts a straightforward postulatory approach that introduces thermodynamic potentials such as entropy and energy more directly and transparently. Structured around several features to assist students' understanding, *Chemical Thermodynamics*: Develops applications and methods for the ready treatment of equilibria on a sound quantitative basis. Requires minimal background in calculus to understand the text and presents formal derivations to the ...

### Contents

1: Postulates of thermodynamics.- 2: Thermodynamic equilibrium in isolated and isentropic systems.- 3: Thermodynamic equilibrium in systems with other constraints.- 4: Thermodynamic processes and engines.- 5: Thermodynamics of mixtures (multi-component systems).- 6: Phase equilibria.- 7: Equilibria of chemical reactions.- 8: Extension of thermodynamics for additional interactions (non-simple systems).- 9: Elements of equilibrium statistical thermodynamics.- 10: Transport processes.

### Fields of Interest

Physical Chemistry; Thermodynamics; Engineering Thermodynamics, Heat and Mass Transfer; Industrial Chemistry/Chemical Engineering; Materials Science, general; Biochemistry, general

### Content Level

Upper undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

2012,XI, 354 p. 77 illus., 6 illus. in color. Softcover

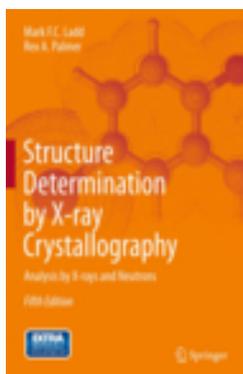
### Medium Type

Book

### Imprint

Springer

Order Quantity



ISBN : 978-1-4614-3956-1

Ladd, Mark, Palmer, Rex, Guildford, UK

## Structure Determination by X-ray Crystallography

### Analysis by X-rays and Neutrons

- Most thorough treatment of crystal geometry and symmetry of any book on the market
- New chapter on neutrons, neutron diffractions, and neutron facilities with several examples of solved structures
- Discussion of computational methods of structure determination, including a suite of computer programs

The advances in and applications of x-ray and neutron crystallography form the essence of this new edition of this classic textbook, while maintaining the overall plan of the book that has been well received in the academic community since the first edition in 1977. X-ray crystallography is a universal tool for studying molecular structure, and the complementary nature of neutron diffraction crystallography permits the location of atomic species in crystals which are not easily revealed by X-ray techniques alone, such as hydrogen atoms or other light atoms in the presence of heavier atoms. Thus, a chapter discussing the practice of neutron ...

### Contents

Crystal morphology and crystal symmetry.- Lattices and space-group theory.- X-rays and X-ray diffraction.- Intensities and intensity statistics.- Examination of single crystals: Optical and X-ray diffraction practice.- Fourier series and Fourier transforms.- Fourier techniques in X-ray structure determination.- Direct methods and refinement.- Examples of crystal structure determination.- Proteins and macromolecular X-ray analysis.- Neutron diffraction from single crystals.- Powder diffraction.- Computer-aided crystallography.

### Fields of Interest

Physical Chemistry; Crystallography and Scattering Methods; Protein Structure; Characterization and Evaluation of Materials; Geophysics/Geodesy

### Content Level

Upper undergraduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

5th ed. 2013,XXXV, 756 p. 419 illus., 52 illus. in color. With online files/update. Softcover

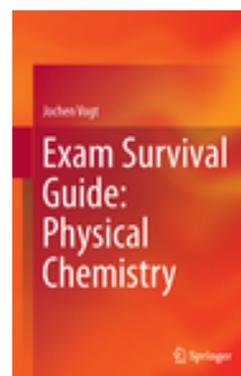
### Medium Type

Book w. online files / update

### Imprint

Springer

Order Quantity



ISBN : 978-3-319-49808-9

Vogt, Jochen, Chemisches Institut der Universität Magdeburg, Magdeburg, Germany

## Exam Survival Guide: Physical Chemistry

- An exercise book, including sound introduction and backgrounds to each topic in textbook style
- Helpful for exam preparation for students at upper undergraduate and graduate level
- Featuring solutions with exhaustive explanations to each of the selected problems

A text- and exercise book for physical chemistry students! This book deals with the fundamental aspects of physical chemistry taught at the undergraduate level in chemistry and the engineering sciences in a compact and practice-oriented form. Numerous problems and detailed solutions offer the possibility of an in-depth reflection

of topics like chemical thermodynamics and kinetics, atomic structure and spectroscopy. Every chapter starts with a recapitulation of important background information, before leading over to representative exercises and problems. Detailed descriptions systematically present and explain the solutions to the problems, ...

### Contents

Quantitative problem solving in Physical Chemistry.- Stoichiometry and Chemical Reactions.- Changes of State.- Thermochemistry.- Chemical Equilibrium.- Kinetic theory.- Electrochemistry.- Quantum Mechanics and Atomic Structure.- Spectroscopy.- Appendix: Periodic Table of the Elements, Physical Constants, Mathematical Formulary.

### Fields of Interest

Physical Chemistry; Thermodynamics; Spectroscopy/Spectrometry; Electrochemistry

### Content Level

Upper undergraduate

### Product category

Undergraduate textbook

Available

### Bibliography

1st ed. 2017,XIII, 382 p. 137 illus., 133 illus. in color. Hardcover

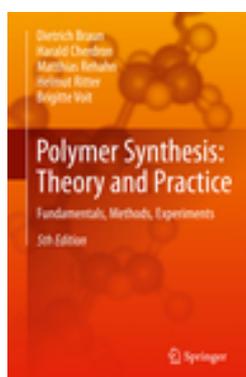
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-3-642-28979-8

Braun, D., Cherdron, H., Rehahn, M., Ritter, H., Voit, B., TU Darmstadt Ernst-Berl-Institut für, Darmstadt, Germany

## Polymer Synthesis: Theory and

## Practice

### Fundamentals, Methods, Experiments

- Cookbook plus textbook concept
- 5th edition contains numerous changes
- New chapter "Polymers with special properties" added

Emphasis is on a broad description of the general methods and processes for the synthesis, modification and characterization of macromolecules. These more fundamental chapters will be supplemented by selected and detailed experiments. In addition to the preparative aspects, the book also gives the reader an impression on the relation of chemical constitution and morphology of Polymers to their properties, as well as on their application areas. Thus, an additional textbook will not be needed in order to understand the experiments. The 5th edition contains numerous changes: In recent years, so-called functional polymers which have special ...

### Contents

Introduction.- Methods and Techniques for Synthesis, Characterization, Processing, and Modification of Polymers.- Synthesis of Macromolecules by Chain Growth Polymerization.- Synthesis of Macromolecules by Step Growth Polymerization.- Modification of Macromolecular Substances.- Functional Polymers.

### Fields of Interest

Polymer Sciences; Organic Chemistry; Soft and Granular Matter, Complex Fluids and Microfluidics; Physical Chemistry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

5th ed. 2013,XXVIII, 404 p. Hardcover

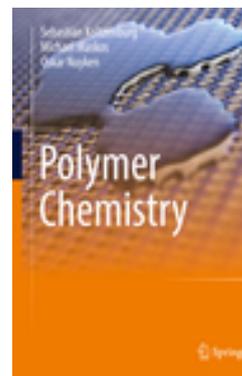
### Medium Type

Book

### Imprint

Springer

### Order Quantity



ISBN : 978-3-662-49277-2

Koltzenburg, S., Maskos, M., Nuyken, O., BASF SE, GMM/B - B001, Ludwigshafen, Germany

## Polymer Chemistry

- English translation of the successful German textbook "Polymere", winner of the Chemical Industry in Germany's 2015 literature prize
- A comprehensive and modern textbook, combining physical-chemical concepts with the chemistry of polymers
- Offers an innovative approach; a clear structure provides the readers with an understanding of physical-chemical properties of polymers, then details synthetic techniques and applications.

This comprehensive textbook describes the synthesis, characterization and technical and engineering applications of polymers. Offering a broad and balanced introduction to the basic concepts of macromolecular chemistry and to the synthesis and physical chemistry of polymers, it is the ideal text for graduate students and advanced Masters students starting out in polymer science. Building on the basic principles of organic chemistry and thermodynamics, it provides an easily understandable and highly accessible introduction to the topic. Step by step, readers will obtain a detailed and well-founded understanding of this vibrant and ...

### Contents

Introduction and Basic Concepts.- Polymers in Solution.- Polymer Analysis: Molar Mass Determination.- Polymers in Solid State.- Partially Crystalline Polymers.- Amorphous Polymers.- Polymers as Materials.- Step-growth Polymerization.- Radical Polymerization.- Ionic Polymerization.- Coordination Polymerization.- Ring-opening Polymerization.- Copolymerization.- Important Polymers Produced by Chain-Growth Polymerization.- Chemistry with Polymers.- Industrially Relevant Polymerization Processes.- The Basics of Plastics Processing.- Elastomers.- Functional Polymers.- Liquid Crystalline Polymers.- Polymers and the Environment.- Current Trends in ...

### Fields of Interest

Polymer Sciences; Organic Chemistry;  
Inorganic Chemistry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

1st ed. 2017,X, 584 p. 676 illus., 665 illus. in color. Hardcover

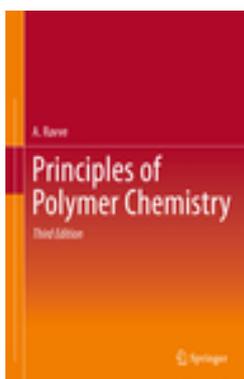
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4614-2211-2

Ravve, A., Consultant in Polymer Chemistry, Niles,  
IL, USA

## Principles of Polymer Chemistry

- New material on the chemistry of polymeric materials for special applications. These subjects are currently of considerable interest in industry and academia
- Only Polymer textbook that combines Organic and Physical Chemistry. Thus, for instance, in each chapter that deals with polymer preparations, both the kinetics and the thermodynamics of the reactions are discussed
- All figures are updated in this edition

This successful textbook undergoes a change of character in the third edition. Where earlier editions covered organic polymer chemistry, the third edition covers both physical and organic chemistry. Thus kinetics and thermodynamics of polymerization reactions are discussed. This edition is also distinct from all other polymer textbooks because of its coverage of such currently hot topics as

photonic polymers, electricity conducting polymers, polymeric materials for immobilization of reagents and drug release, organic solar cells, organic light emitting diodes. This textbook contains review questions at the end of every chapter, references ...

### Contents

Physical Properties and Physical Chemistry of Polymers.- Free-Radical Chain-Growth Polymerization.- Ionic Chain-Growth Polymerization.- Ring-Opening Polymerizations.- Common Chain-Growth Polymers.- Step-Growth Polymerization and Step-Growth Polymers.- Naturally Occurring Polymers.- Reactivity and Chemical Modifications of Polymers.- Polymeric Materials for Special Applications.

### Fields of Interest

Polymer Sciences; Organic Chemistry;  
Physical Chemistry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

3rd ed. 2012,XV, 801 p. Hardcover

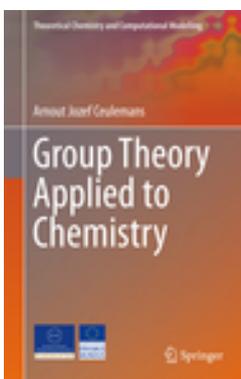
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-94-007-6862-8

Ceulemans, Arnout Jozef, Katholieke Universiteit  
Leuven, Leuven, Belgium

## Group Theory Applied to Chemistry

- Takes a mathematical approach to understanding group theory
- Includes exercises
- Goes back to basics

Chemists are used to the operational definition of symmetry, which crystallographers introduced long before the advent of quantum mechanics. The ball-and-stick models of molecules naturally exhibit the symmetrical properties of macroscopic objects. However, the practitioner of quantum chemistry and molecular modeling is not concerned with balls and sticks, but with subatomic particles: nuclei and electrons. This textbook introduces the subtle metaphors which relate our macroscopic understanding of symmetry to the molecular world. It gradually explains how bodily rotations and reflections, which leave all inter-particle distances unaltered, ...

### Contents

Operations.- Function spaces and matrices.- Groups.- Representations.- What has quantum chemistry got to do with it?.- Interactions.- Spherical symmetry and spins.

### Fields of Interest

Theoretical and Computational Chemistry;  
Crystallography and Scattering Methods;  
Inorganic Chemistry

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2013,XIII, 269 p. 63 illus., 11 illus. in color.  
(Theoretical Chemistry and Computational  
Modelling) Hardcover

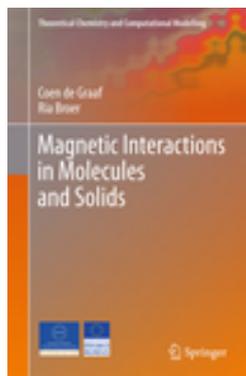
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-319-22950-8

de Graaf, Coen, Broer, Ria, Universitat Rovira i Virgili / ICREA, Tarragona, Spain

## Magnetic Interactions in Molecules and Solids

- Targeted at Masters students in Chemistry
- Designed as a textbook for those studying magnetic interactions in molecules and solids and magnetic materials
- Provides a clear overview of the basics

This textbook is the second volume in the Theoretical Chemistry and Computational Modeling series and aims to explain the theoretical basis of magnetic interactions at a level that will be useful for master students in physical, inorganic and organic chemistry. The book gives a treatment of magnetic interactions in terms of the phenomenological spin Hamiltonians that have been such powerful tools for chemistry and physics in the past half century, starting from the simple Heisenberg and Ising Hamiltonians and ending with Hamiltonians that include biquadratic, cyclic or anisotropic exchange. On the other hand, it also explains how quantum ...

### Contents

1. Basic Concepts.- 2. One Magnetic Center.- 3. Two (or more) Magnetic Centers.- 4. From Orbital Models to Accurate Predictions.- 5. Towards a Quantitative Understanding.- 6. Magnetism and Conduction.

### Fields of Interest

Theoretical and Computational Chemistry; Inorganic Chemistry; Structural Materials

### Content Level

Research

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

1st ed. 2015,XVI, 246 p. 75 illus., 32 illus. in color.(Theoretical Chemistry and Computational Modelling) Hardcover

### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4614-3522-8

Carter, C. Barry, Norton, M. Grant, University of Connecticut, Storrs, CT, USA

## Ceramic Materials

### Science and Engineering

- Integrates the excitement of new advances in ceramics, including nanotechnology, medicine and clean energy, with fundamental concepts such as structure and defects
- Explores the environmental and economic impact of ceramics on society
- Describes the use of ceramics as the basis for many of today's critical technologies, including drug delivery, orthopedic implants, sensors and catalysis

Ceramic Materials: Science and Engineering is an up-to-date treatment of ceramic science, engineering, and applications in a single, comprehensive text. Building on a foundation of crystal structures, phase equilibria, defects, and the mechanical properties of ceramic materials, students are shown how these materials are processed for a wide diversity of applications in today's society. Concepts such as how and why ions move, how ceramics interact with light and magnetic fields, and how they respond to temperature changes are discussed in the context of their applications. References to the art and history of ceramics are included throughout ...

### Contents

Preface to the First Edition.- Preface to the Second Edition.- Foreword.- PART I: History and Introduction.- Chapter 1: Introduction.- Chapter 2: Some History.- PART II: Materials.- Chapter 3: Background You Need to Know.- Chapter 4: Bonds and Energy Bands.- Chapter 5: Models, Crystals and Chemistry.- Chapter 6:

Binary Compounds.- Chapter 7: Complex Crystal and Glass Structures.- Chapter 8: Equilibrium Phase Diagrams.- PART III: Tools.- Chapter 9: Furnaces.- Chapter 10: Characterizing Structure, Defects and Chemistry.- PART IV: Defects.- Chapter 11: Point Defects, Charge and Diffusion.- Chapter 12: Are Dislocations Unimportant?.- Chapter 13: ...

### Fields of Interest

Ceramics, Glass, Composites, Natural Materials; Inorganic Chemistry; Solid Mechanics; Nanotechnology; Characterization and Evaluation of Materials; Optical and Electronic Materials

### Content Level

Research

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2nd ed. 2013,XXXIII, 766 p. Hardcover

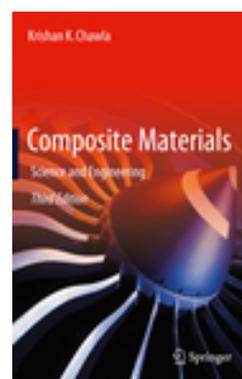
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-1-4939-5015-7

Chawla, Krishan K., UAB Mail, Birmingham, AL, USA

## Composite Materials

### Science and Engineering

- Updated and enlarged third edition of a widely used text
- Offers integrated and completely up-to-date coverage of composite materials
- Includes many new exercises and illustrations, new material on fatigue and creep of composites, and a new chapter on non-conventional composites

The third edition of Krishan Chawla's widely used textbook, *Composite Materials*, offers integrated and completely up-to-date coverage of composite materials. The book focuses on the triad of processing, structure, and properties, while providing a well-balanced treatment of the materials science and mechanics of composites. In this edition of *Composite Materials*, revised and updated throughout, increasing use of composites in industry (especially aerospace and energy) and new developments in the field are highlighted. There is a new chapter on non-conventional composites, which covers polymer, metal and ceramic matrix nanocomposites, ...

### Contents

1. Introduction.- 2. Reinforcements.- 3. Matrix Materials.- 4. Interfaces.- 5. Polymer Matrix Composites.- 6. Metal Matrix Composites.- 7. Ceramic Matrix Composites.- 8. Carbon Fiber/Carbon Matrix Composites.- 9. Multifilamentary Superconducting Composites.- 10. Micromechanics of Composites.- 11. Macromechanics of Composites.- 12. Monotonic Strength and Fracture.- 13. Fatigue and Creep.- 14. Designing with Composites.- 15. Non-Conventional Composites.

### Fields of Interest

Ceramics, Glass, Composites, Natural Materials; Engineering Design; Polymer Sciences; Mechanical Engineering; Civil Engineering

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

Softcover reprint of the original 3rd ed. 2012,XXIII, 542 p. 258 illus., 203 illus. in color. Softcover

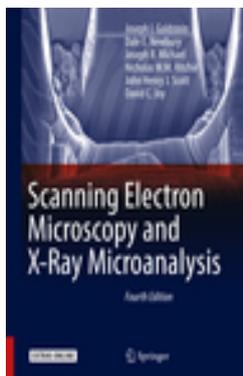
### Medium Type

Book (Paperback Initiative)

### Imprint

Springer

Order Quantity



ISBN : 978-1-4939-6674-5

Goldstein, J.I., Newbury, D.E., Michael, J.R., Ritchie, N.W.M., Scott, J.H.J., Joy, D.C., University of Massachusetts, Amherst, MA, USA

## Scanning Electron Microscopy and X-Ray Microanalysis

- Realigns the text with the needs of a diverse audience from researchers and graduate students to SEM operators and technical managers
- Emphasizes practical, hands-on operation of the microscope, particularly user selection of the critical operating parameters to achieve meaningful results
- Provides step-by-step overviews of SEM, EDS, and EBSD and checklists of critical issues for SEM imaging, EDS x-ray microanalysis, and EBSD crystallographic measurements

This thoroughly revised and updated Fourth Edition of a time-honored text provides the reader with a comprehensive introduction to the field of scanning electron microscopy (SEM), energy dispersive X-ray spectrometry (EDS) for elemental microanalysis, electron backscatter diffraction analysis (EBSD) for micro-crystallography, and focused ion beams. Students and academic researchers will find the text to be an authoritative and scholarly resource, while SEM operators and a diversity of practitioners — engineers, technicians, physical and biological scientists, clinicians, and technical managers — will find that every chapter has been ...

### Contents

Preface.- Scanning Electron Microscopy and Associated Techniques: Overview.- Electron Beam – Specimen Interactions: Interaction Volume.- Backscattered Electrons.- Secondary Electrons.- X-rays.- SEM Instrumentation.- Image Formation.- SEM Image Interpretation.- The Visibility of Features in SEM Images.- Image Defects.- High resolution imaging.- Low Beam Energy SEM.- Variable Pressure Scanning Electron Microscopy (VPSEM).- ImageJ and Fiji.- SEM Imaging checklist.- SEM Case Studies.- Energy Dispersive X-ray Spectrometry: Physical Principles and User-Selected Parameters.- DTSA-II EDS Software.- Qualitative Elemental Analysis by Energy Dispersive ...

### Fields of Interest

Characterization and Evaluation of Materials; Spectroscopy and Microscopy; Biological Microscopy; Spectroscopy/Spectrometry; Measurement Science and Instrumentation

### Content Level

Graduate

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

4th ed. 2018,XXIII, 550 p. 546 illus., 409 illus. in color. With online files/update. Hardcover

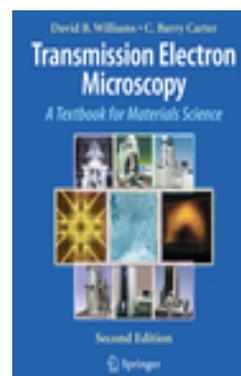
### Medium Type

Book w. online files / update

### Imprint

Springer

Order Quantity



ISBN : 978-0-387-76500-6

Williams, David B., Carter, C. Barry, University of Alabama, Huntsville Office of the President, Huntsville, AL, USA

## Transmission Electron Microscopy

### A Textbook for Materials Science

- Undisputed market leader, now completely revised and updated
- First-ever TEM text with four-color illustrations throughout
- Includes approximately 800 self-assessment questions and over 400 questions suitable for homework assignment

This groundbreaking text has been established as the market leader throughout the world. Profusely illustrated, *Transmission Electron Microscopy: A Textbook for Materials Science* provides the necessary instructions for successful hands-on application of this

versatile materials characterization technique. For this first new edition in 12 years, many sections have been completely rewritten with all others revised and updated. The new edition also includes an extensive collection of questions for the student, providing approximately 800 self-assessment questions and over 400 questions that are suitable for homework assignment. Four-color ...

### Contents

Basics.- The Transmission Electron Microscope.- Scattering and Diffraction.- Elastic Scattering.- Inelastic Scattering and Beam Damage.- Electron Sources.- Lenses, Apertures, and Resolution.- How to 'See' Electrons.- Pumps and Holders.- The Instrument.- Specimen Preparation.- Diffraction.- Diffraction in TEM.- Thinking in Reciprocal Space.- Diffracted Beams.- Bloch Waves.- Dispersion Surfaces.- Diffraction from Crystals.- Diffraction from Small Volumes.- Obtaining and Indexing Parallel-Beam Diffraction Patterns.- Kikuchi Diffraction.- Obtaining CBED Patterns.- Using Convergent-Beam Techniques.- Imaging.- Amplitude Contrast.- Phase-Contrast ...

### Fields of Interest

Characterization and Evaluation of Materials; Nanotechnology; Solid State Physics; Spectroscopy and Microscopy; Solid Mechanics

### Content Level

Research

### Product category

Graduate/advanced undergraduate textbook

Available

### Bibliography

2nd ed. 2009,LXII, 775 p. Hardcover

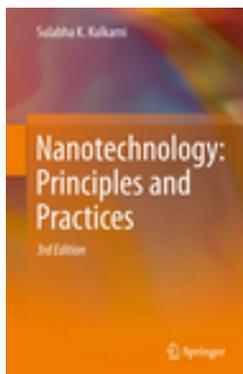
### Medium Type

Book

### Imprint

Springer

[Order Quantity](#)



ISBN : 978-3-319-09170-9

Kulkarni, Sulabha K., Indian Institute of Science Education and Research, Pune, India

## Nanotechnology: Principles and Practices

- A comprehensive and up-to-date textbook on nanomaterials and nanotechnologies
- Strikes the right balance in presenting syntheses, materials, analytical techniques and applications
- Covers the physical, chemical and biological properties of nanomaterials

Given the rapid advances in the field, this book offers an up-to-date introduction to nanomaterials and nanotechnology. Though condensed into a relatively small volume, it spans the whole range of multidisciplinary topics related to nanotechnology. Starting with the basic concepts of quantum mechanics and solid state physics, it presents both physical and chemical synthetic methods, as well as analytical techniques for studying nanostructures. The size-specific properties of nanomaterials, such as their thermal, mechanical, optical and magnetic characteristics, are discussed in detail. The book goes on to illustrate the various applications ...

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### Fields of Interest

Nanotechnology; Nanoscale Science and Technology; Nanochemistry

### Content Level

Upper undergraduate

### Product category

Graduate/advanced undergraduate textbook

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