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WELCH CUNNINGHAM

Fundamentals of Molecular Spectroscopy Oxford University Press

A non-mathematical introduction to molecular spectroscopy. This revision includes: a chapter on the spectroscopy of surfaces and solids, new diagrams and problems, spectra that has been re-recorded on modern instruments, and enhanced applications of Fourier transform principles. *Fundamentals of Molecular Spectroscopy* Springer Science & Business Media

Mathematical skills and concepts lie at the heart of chemistry, yet they are the aspect of the subject that many students fear the most. Maths for Chemistry recognizes the challenges faced by many students in equipping themselves with the maths skills necessary to gain a full understanding of chemistry. Working from foundational principles, the book builds the student's confidence by leading them through the subject in a steady, progressive way from basic algebra to quantum mathematics. Opening with the core mathematics of algebra, logarithms and trigonometry, the book goes on to cover calculus, matrices, vectors, complex numbers, and laboratory mathematics to cover everything that a chemistry student needs. With its modular structure, the book presents material in short, manageable sections to keep the content as accessible and readily digestible as possible. Maths for Chemistry is the perfect introduction to the essential mathematical concepts which all chemistry students should master.

Elementary Organic Spectroscopy Woodhead Publishing

Spectroscopy is the study of electromagnetic radiation and its interaction with solid, liquid, gas and plasma. It is one of the widely used analytical techniques to study the structure of atoms and molecules. The technique is also employed to obtain information about atoms and molecules as a result of their distinctive spectra. The fast-spreading field of spectroscopic applications has made a noteworthy influence on many disciplines, including energy research, chemical processing, environmental protection and medicine. This book aims to introduce students to the topic of spectroscopy. The author has avoided the mathematical aspects of the subject as far as possible; they appear in the text only when inevitable. Including topics such as time-dependent perturbation theory, laser action and applications of Group Theory in interpretation of spectra, the book offers a detailed coverage of the basic concepts and applications of spectroscopy.

Effects of Electric Fields on Structure and Reactivity New Age International

PRINCIPLES AND CHEMICAL APPLICATIONS FOR B.SC.(HONS) POST GRADUATE STUDENTS OF ALL INDIAN UNIVERSITIES AND COMPETITIVE EXAMINATIONS.

Applied Infrared Spectroscopy Bloomsbury Publishing

This latest edition of the highly successful text *Organic Spectroscopy* continues to keep both student and researcher informed of the most recent developments in the various fields of spectroscopy. New features of the third edition include: - 100 new student exercises, worked examples and problem exercises. - An expanded chapter on nuclear magnetic resonance. - Details of the latest developments in Fourier transform instrumentation.

Spectroscopic Problems in Organic Chemistry PHI Learning Pvt. Ltd.

Annotation Rodgers (U. of Oxford) provides graduate students and other researchers a background to the inverse problem and its solution, with applications relating to atmospheric measurements. He introduces the stages in the reverse order than the usual approach in order to develop the learner's intuition about the nature of the inverse problem. Annotation copyrighted by Book News, Inc., Portland, OR.

Fundamentals of Molecular Spectroscopy S. Chand Publishing

Designed to serve as a textbook for postgraduate students of physics and chemistry, this second edition improves the clarity of treatment, extends the range of topics, and includes more worked examples with a view to providing all the material needed for a course in molecular spectroscopy—from first principles to the very useful spectral data that comprise figures, charts and tables. To improve the conceptual appreciation and to help students develop more positive

and realistic impressions of spectroscopy, there are two new chapters—one on the spectra of atoms and the other on laser spectroscopy. The chapter on the spectra of atoms is a detailed account of the basic principles involved in molecular spectroscopy. The chapter on laser spectroscopy covers some new experimental techniques for the investigation of the structure of atoms and molecules. Additional sections on interstellar molecules, inversion vibration of ammonia molecule, fibre-coupled Raman spectrometer, Raman microscope, supersonic beams and jet-cooling have also been included. Besides worked-out examples, an abundance of review questions, and end-of-chapter problems with answers are included to aid students in testing their knowledge of the material contained in each chapter. Solutions manual containing the complete worked-out solutions to chapter-end problems is available for instructors.

Vibrational Spectroscopy Elsevier

The biggest change in the years since the first edition is the proliferation of computational chemistry programs that calculate molecular properties. McQuarrie presents step-by-step SCF calculations of a helium atom and a hydrogen molecule, in addition to including the Hartree-Fock method and post-Hartree-Fock methods.

More Spectroscopic Problems in Organic Chemistry Springer

Atomic and Molecular Processes focuses on radiative and collisional processes involving atoms or molecules, including photoionization, elastic and inelastic scattering of electrons, energy loss by slow electrons, excitation, ionization, detachment, charge transfer, elastic scattering, and chemical reactions. The selection first offers information on forbidden and allowed transitions, including forbidden transitions in diatomic molecular spectra; forbidden transitions in crystals; calculations of atomic line strengths; and measurements of atomic transition probabilities. The book also ponders on photoionization processes, photodetachment, and high temperature shock waves. The manuscript elaborates on electronic and ionic recombination, elastic scattering of electrons, and the motions of slow electrons in gases. The book also evaluates the theory of excitation and ionization by electron impact; measurement of collisional excitation and ionization cross sections; and spectral line broadening in plasmas. The selection is a dependable reference for readers interested in atomic and molecular processes.

Organic Spectroscopy PHI Learning Pvt. Ltd.

Sulfur compounds contaminate many industrially important feedstocks and, on release to the atmosphere as sulfur oxides, can cause widespread damage to the ecosystem. The main objectives of The Sulfur Problem: Cleaning Up Industrial Feedstocks are to demonstrate the importance of eliminating sulfur contaminants from the environment and the measures necessary to effect this. Using a systematic and pedagogical approach, the reader is first presented with the problem. Current technology for solving it is then outlined together with appropriate theory on the synthesis, structure and sorption behaviour of the materials used. Relevant characterisation techniques are described with reference to typical sorbents, to demonstrate how the sorption behaviour of the materials correlates with their properties. The book is unique in blending together aspects of environmental chemistry, materials/solid state chemistry, surface chemistry, catalysis and separation processes to address the problem of sulfur contaminants in a wide range of feedstocks.

Molecular Spectroscopy McGraw-Hill Book Company Limited

Informal, effective undergraduate-level text introduces vibrational and electronic spectroscopy, presenting applications of group theory to the interpretation of UV, visible, and infrared spectra without assuming a high level of background knowledge. 200 problems with solutions. Numerous illustrations. "A uniform and consistent treatment of the subject matter." — Journal of Chemical Education.

Quantum Chemistry Pearson

The latest edition of this highly acclaimed title introduces the reader to a wide range of spectroscopies, and includes both the background theory and applications to structure determination and chemical analysis. It covers rotational, vibrational, electronic, photoelectron and

Auger spectroscopy, as well as EXAFs and the theory of lasers and laser spectroscopy. * A revised and updated edition of a successful, clearly written book * Includes the latest developments in modern laser techniques, such as cavity ring-down spectroscopy and femtosecond lasers * Provides numerous worked examples, calculations and questions at the end of chapters

Maths for Chemistry Courier Corporation

Infrared and Raman Spectroscopy, Principles and Spectral Interpretation, Second Edition provides a solid introduction to vibrational spectroscopy with an emphasis on developing critical interpretation skills. This book fully integrates the use of both IR and Raman spectroscopy as spectral interpretation tools, enabling the user to utilize the strength of both techniques while also recognizing their weaknesses. This second edition more than doubles the amount of interpreted IR and Raman spectra standards and spectral unknowns. The chapter on characteristic group frequencies is expanded to include increased discussions of sulphur and phosphorus organics, aromatic and heteroaromatics as well as inorganic compounds. New topics include a discussion of crystal lattice vibrations (low frequency/THz), confocal Raman microscopy, spatial resolution in IR and Raman microscopy, as well as criteria for selecting Raman excitation wavelengths. These additions accommodate the growing use of vibrational spectroscopy for process analytical monitoring, nanomaterial investigations, and structural and identity determinations to an increasing user base in both industry and academia. Integrates discussion of IR and Raman spectra Pairs generalized IR and Raman spectra of functional groups with tables and text Includes over 150 fully interpreted, high quality IR and Raman reference spectra Contains fifty-four unknown IR and Raman spectra, with a corresponding answer key

Acronyms and Abbreviations in Molecular Spectroscopy Academic Press

"Highly recommended for all academic library chemistry collections; biochemistry and medical collections may also want to consider." (Choice) "Each entry is provided with a definition, a description of the effect, application, and literature citations."... the selection in this book is broad and useful." (J. of Am. Chem. Soc.) "The book is not just a collection of definitions of acronyms, each entry contains a concise and informative explanation of the origins of the technique or method to which it refers... this book is a must for progression of any budding spectroscopist." (Analyst)

Annual Reports on NMR Spectroscopy Royal Society of Chemistry

A non-mathematical introduction to molecular spectroscopy. This revision includes: a chapter on the spectroscopy of surfaces and solids, new diagrams and problems, spectra that has been re-recorded on modern instruments, and enhanced applications of Fourier transform principles. *Fundamentals of Molecular Spectroscopy*. New Age International

This is an introductory text for students which will bring them up to speed ready for first-year university level physical chemistry. The text begins by looking at atoms and their structure, and goes on to study different phases of matter and relates them to forces acting between molecules. As the book progresses, it analyses both phase and chemical equilibria, energy and kinetics, and the final section is about reactive free radicals.

ATOMIC AND MOLECULAR PHYSICS Wiley-Interscience

Praise for Introductory Raman Spectroscopy Highlights basic theory, which is treated in an introductory fashion Presents state-of-the-art instrumentation Discusses new applications of Raman spectroscopy in industry and research

MOLECULAR STRUCTURE AND SPECTROSCOPY Academic Press

The book is primarily intended for the students pursuing an honours degree in chemistry. The chapters have been designed to enable the beginners to delve into the subject gradually right from the elementary aspects of organic chemistry, such as properties of molecules and nomenclature, to discussions on organic compounds in the traditional way, that is, beginning with the hydrocarbons and ending up with carboxylic acids and their derivatives with due emphasis on both aliphatic and aromatic compounds. This has been followed by heterocyclic compounds. Chapters on organic reaction mechanism and stereochemistry have been dealt with extra care to enable

beginners to master organic chemistry to the core. Natural products, an important part of organic chemistry, have been dealt with due care avoiding too much detail. Each chapter has been supplemented with well chosen worked-out problems to help the students build a strong foundation in the subject.

Atomic Structure and Chemical Bond University Science Books

Vibrational Spectroscopy Provides In A Very Readable Fashion A Comprehensive Account Of The Fundamental Principles Of Infrared And Raman Spectroscopy For Structural Applications To Inorganic, Organic And Coordination Compounds. Theoretical Analyses Of The Spectra By Normal

Coordinate Treatment, Factor Group Analysis And Molecular Mechanics Are Delineated. The Book Features: * Coverage From First Principles To Recent Advances * Relatively Self-Contained Chapters * Experimental Aspects * Step By Step Treatment Of Molecular Symmetry And Group Theory * Recent Developments Such As Non-Linear Raman Effects * Comprehensive Treatment Of Rotation Spectroscopy * Band Intensities * Spectra Of Crystals * End-Of-Chapter Exercises. Suitable For Students And Researchers Interested In The Field Of Vibrational Spectroscopy. No Prior Knowledge Of Concepts Specific To Vibrational Spectroscopy Is Necessary. Mathematical Background Such As Matrices And Vectors Are Provided.
CRC Press

Presents an overview of applications, a critical evaluation of current techniques for sampling and for obtaining spectra, and an extensive guide to the literature, both spectra and papers. Covers everything from how to prepare almost any kind of sample and how to optimize the controls on an infrared spectrometer, to identifying and measuring pollutants at the parts per million level. Stresses all fundamental concepts and limitations; includes examples of difficulties and pitfalls throughout. Emphasizes development of technique and careful manipulation of samples and spectrometers. Highlights quantitative analysis with examples. Also reviews factors affecting group frequencies.