

SELECTED PAPERS OF
Robert S. Mulliken

Edited by D. A. Ramsay and J. Hinze



Selected Papers Of Robert S Mulliken

Philip Bunker



Selected Papers Of Robert S Mulliken:

Selected Papers of Robert S. Mulliken Robert S. Mulliken, 1975-08 This book brings together in one volume the most important papers of Robert S Mulliken who was awarded the 1966 Nobel Prize in chemistry for his seminal work on chemical bonds and the electronic structures of molecules The papers collected here range from suggestive to closely detailed analyses of various topics in the theory of spectra and electronic structure of diatomic and polyatomic molecules Professor Mulliken has written introductory commentaries on each of the volume s seven parts Included in the volume are essays of general as well as scientific interest they are grouped under thematic headings Part I contains those papers which are of historical significance An autobiographical piece by Dr Mulliken offers a glimpse of the many famous people whom he has known Also reprinted is the text of his Nobel Prize acceptance speech At the end is a list of his students and other co workers and a complete bibliography of his papers Part II includes Mulliken s work on band spectra and chemistry as well as his research on the assignment of quantum numbers for electrons in molecules Part III surveys the author s early work on the bonding power of electrons and the method of molecular orbitals Included is a discussion of the structure and spectra of a number of important types of molecules The papers in part IV focus on the intensities of electronic transitions in molecular spectra This incorporates Mulliken s work on charge transfer and the halogen molecule spectra The problems addressed in part V center on the spectra and structure of polyatomic molecules Reprinted here is a report which Mulliken prepared on notation for polyatomic molecules Part VI is devoted to the problem of hyperconjugation These papers develop and apply the concept of hyperconjugation and explore its relation to the concept of conjugation The last part offers some of the most important papers from the author s postwar publications The central focus is on molecular orbital theory the area in which Mulliken s Nobel winning discoveries were made Robert S. Mulliken: Selected Papers D. A. Ramsay, J. Hinze, 1975

Physical Chemistry from Ostwald to Pauling John W. Servos, 2021-05-11 John Servos explains the emergence of physical chemistry in America by presenting a series of lively portraits of such pivotal figures as Wilhelm Ostwald A A Noyes G N Lewis and Linus Pauling and of key institutions including MIT the University of California at Berkeley and Caltech In the early twentieth century physical chemistry was a new hybrid science the molecular biology of its time The names of its progenitors were familiar to everyone who was scientifically literate studies of aqueous solutions and of chemical thermodynamics had transformed scientific knowledge of chemical affinity By exploring the relationship of the discipline to industry and to other sciences and by tracing the research of its leading American practitioners Servos shows how physical chemistry was eclipsed by its own offspring specialties like quantum chemistry **Life of a Scientist** Robert S. Mulliken, 2012-12-06 Robert S Mulliken Nobel Laureate in chemistry always had the intention to write a book about his field of research molecular orbital theory This is his scientific autobiography edited posthumously by his former student Bernard J Ransil and complemented with a memoir by Friedrich Hund his scientific protagonist Mulliken describes his career and gives

an account of the contributions of his friends and colleagues at home and in Europe where he frequently travelled And last but not least he gives an accurate history of how the molecular orbital theory originated and how it evolved in an atmosphere of international exchange The book is written in a particularly lively style full of reminiscences and scientific facts interwoven to produce an account of the Life of a Scientist **Catalog of Copyright Entries. Third Series** Library of Congress.

Copyright Office,1978 **History of Science in United States** Marc Rothenberg,2012-10-12 This Encyclopedia examines all aspects of the history of science in the United States with a special emphasis placed on the historiography of science in America It can be used by students general readers scientists or anyone interested in the facts relating to the development of science in the United States Special emphasis is placed in the history of medicine and technology and on the relationship between science and technology and science and medicine

Lines of Light J.C.D. Brand,2017-11-22 This work provides a perspective on the creation of a scientific discipline The reader is led to meet the actual people who have contributed to this field and know their trials as well as breakthroughs From 1800 to 1930 Brand preserves the thread of scientific thought and activity through six generations of working scientists

The Chemical Tree William Hodson Brock,2000 From alchemy to industry this authoritative volume is a synthetic history of chemistry through the ages from its development as a scientific philosophy to its modern day practical applications A New York Times Notable Book of illustrations

Biographical Memoirs National Academy of Sciences,2000-12-13 Biographic Memoirs Volume 78 contains the biographies of deceased members of the National Academy of Sciences and bibliographies of their published works Each biographical essay was written by a member of the Academy familiar with the professional career of the deceased For historical and bibliographical purposes these volumes are worth returning to time and again

The ^AHeroic Age Robert D. Purrington,2018-01-22 Presents a detailed look at the period between 1925 and leading up to WWII in which quantum theory was created and then quickly applied to nuclear atomic molecular and solid state physics The book includes a heavy emphasis on the scientific literature rather than a breezy overview of this period focusing on personalities or personal stories of the scientists involved

Robert Burns Woodward Otto Theodor Benfey,Peter John Turnbull Morris,2001 Robert Burns Woodward was the star of 20th century organic chemistry An MIT graduate by age 19 Woodward s ingenious notions about organic synthesis and his artful methodology were astounding He is most famed for his synthesis of vitamin B12 which he undertook with Albert Eschenmoser and for the orbital symmetry rules he developed with Roald Hoffmann This volume presents Woodward s most celebrated papers and lectures including the famous Cope lecture Insightful commentaries and rarely seen photographs are also included

From Chemical Philosophy to Theoretical Chemistry Mary Jo Nye,1994-03-01 How did chemistry and physics acquire their separate identities and are they on their way to losing them again Mary Jo Nye has written a graceful account of the historical demarcation of chemistry from physics and subsequent reconvergences of the two from Lavoisier and Dalton in the late eighteenth century to Robinson Ingold and Pauling in the mid twentieth century Using the notion of a

disciplinary identity analogous to ethnic or national identity Nye develops a theory of the nature of disciplinary structure and change She discusses the distinctive character of chemical language and theories and the role of national styles and traditions in building a scientific discipline Anyone interested in the history of scientific thought will enjoy pondering with her the question of whether chemists of the mid twentieth century suspected chemical explanation had been reduced to physical laws just as Newtonian mechanical philosophers had envisioned in the eighteenth century **Physical Chemistry:**

Statistical Mathematics Ke. Dī Jhā, 2009

Molecular Symmetry and Spectroscopy Philip Bunker, 2012-12-02

Molecular Symmetry and Spectroscopy deals with the use of group theory in quantum mechanics in relation to problems in molecular spectroscopy It discusses the use of the molecular symmetry group whose elements consist of permutations of identical nuclei with or without inversion After reviewing the permutation groups inversion operation point groups and representation of groups the book describes the use of representations for labeling molecular energy The text explains an approximate time independent Schrödinger equation for a molecule as well as the effect of a nuclear permutation or the inversion of E on such equation The book also examines the expression for the complete molecular Hamiltonian and the several groups of operations commuting with the Hamiltonian The energy levels of the Hamiltonian can then be symmetrically labeled by the investigator using the irreducible representations of these groups The text explains the two techniques to change coordinates in a Schrödinger equation namely 1 by using a diatomic molecule in the rovibronic Schrödinger equation and 2 by a rigid nonlinear polyatomic molecule The book also explains that using true symmetry basis symmetry near symmetry and near quantum numbers the investigator can label molecular energy levels The text can benefit students of molecular spectroscopy academicians and investigators of molecular chemistry or quantum mechanics

Supramolecular Photochemistry V. Ramamurthy, Yoshihisa Inoue, 2011-07-07 This is the most updated comprehensive collection of monographs on all aspects of photochemistry and photophysics related to natural and synthetic inorganic organic and biological supramolecular systems Supramolecular Photochemistry Controlling Photochemical Processes addresses reactions in crystals organized assemblies monolayers zeolites clays silica micelles polymers dendrimers organic hosts supramolecular structures organic glass proteins and DNA and applications of photosystems in confined media This landmark publication describes the past present and future of this growing interdisciplinary area **Electron**

Distributions and the Chemical Bond Philip Coppens, Michael B. Hall, 2012-12-06 This book represents the proceedings of a symposium held at the Spring 1981 ACS meeting in Atlanta The symposium brought together Theoretical Chemists Solid State Physicists Experimental Chemists and Crystallographers One of its major aims was to increase interaction between these diverse groups which often use very different languages to describe similar concepts The development of a common language or at least the acquisition of a multilingual capability is a necessity if the field is to prosper Much depends in this field on the interplay between theory and experiment Accordingly this volume begins with two introductory chapters one

theoretical and the other experimental which contain much of the background material needed for a through understanding of the field The remaining sections describe a wide variety of applications and illustrate we believe the central role of charge densities in the understanding of chemical bonding We are most indebted to the Divisions of Inorganic and Physical Chemistry of the American Chemical Society which provided the stimulus for the symposium and gave generous financial support We also gratefully acknowledge financial support from the Special Educational Opportunities Program of the Petroleum Research Fund administered by the American Chemical Society which made extensive participation by speakers from abroad possible

Bioluminescence and Chemiluminescence Marlene A. Deluca, William D. McElroy, 2013-09-11

Bioluminescence and Chemiluminescence Basic Chemistry and Analytical Applications is a compendium of papers presented at the second International Symposium on Analytical Applications of Bioluminescence and Chemiluminescence in San Diego California on August 26-28, 1980 Part I deals with chemiluminescence and excited states including topics on the spectroscopy of the solvent cage generation and characteristics of the excited state and the three features of chemi and bioluminescence Part II deals with events prior to producing luminol dependent chemiluminescence this part also examines the effects of stimulants on membrane potential Part III discusses bacterial bioluminescence and analyzes the properties of a lumazine protein from a bioluminescent bacterium This part also analyzes accessory enzymes responsible for such bacterial bioluminescence Part IV examines the chemistry of firefly bioluminescence and presents the formula of three reactions catalyzed by firefly luciferase Part V analyzes bioluminescence from other sources such as the earthworm and land snails Part VI discusses the applications of bioluminescence in clinical chemistry soil science and marine biology Part VII deals with the future uses of bioluminescence while Part VIII is an abstract of other papers dealing with this subject This collection can be helpful for biologists zoologists microbiologists marine biologists and researchers dealing with biochemistry and related disciplines

Current Book Review Citations, 1977

Linus Pauling - Selected Scientific Papers (In 2 Volumes) - Volume 2 Barclay Kamb, Linda Pauling Kamb, Carl Alexander Kamb, Peter Jeffress Pauling, Linus Pauling Jr, 2001-11-02

Linus Pauling wrote a stellar series of over 800 scientific papers spanning an amazing range of fields some of which he himself initiated This book is a selection of the most important of his writings in the fields of quantum mechanics chemical bonding covalent ionic metallic and hydrogen bonding molecular rotation and entropy protein structure hemoglobin molecular disease molecular evolution the antibody mechanism the molecular basis of anesthesia orthomolecular medicine radiation chemistry biology and nuclear structure Through these papers the reader gets a fresh unfiltered view of the genius of Pauling's many contributions to chemistry chemical physics molecular biology and molecular medicine

Group Theory Applied to Chemistry Arnout Jozef Ceulemans, 2024-04-04

The second edition of this textbook provides a more elaborate explanation of several important group theoretical concepts in quantum chemistry such as the bra-ket conjugation relation the connection between point groups and isometries the practical use of subduction tables the eigenvalues of Cayley graphs and the

symmetry of Slater determinants A new chapter introduces the application of line and plane groups to the properties of nanostructured low dimensional molecular systems In addition several extra study problems are inserted to illustrate group theory at work in molecular science The book is of great interest to advanced undergraduate and graduate students enabling them to put the tools of group theory into practice when studying chemical problems of their own research More experienced researchers will find in this book useful leads to the mathematical aspects of their subject

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