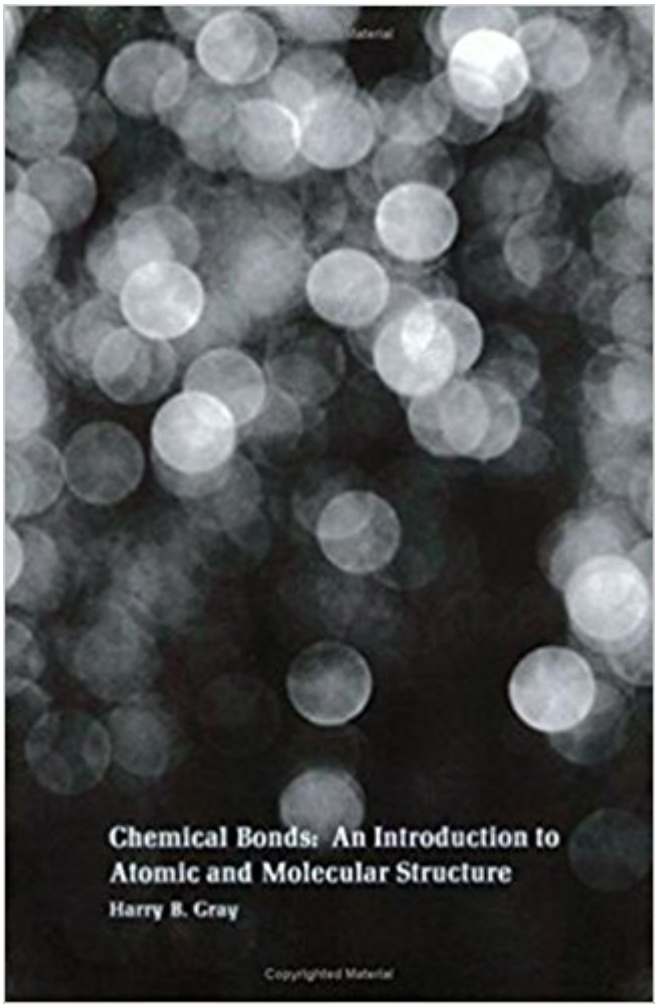
Chemical Bonds: An Introduction To Atomic And Molecular Structure



Synopsis

Designed for science students, this book provides an introduction to atomic and molecular structure and bonding. Following two initial chapters on atomic structure and the electronic properties of atoms and molecules, the book is largely organized according to molecule size, moving from an examination of diatomic molecules in Chapter Three to the infinitely large atomic clusters in Chapter Six.

Book Information

Paperback: 232 pages

Publisher: University Science Books; 2nd edition (December 1994)

Language: English

ISBN-10: 0935702350

ISBN-13: 978-0935702354

Product Dimensions: 0.8 x 6.8 x 9.5 inches

Shipping Weight: 12 ounces (View shipping rates and policies)

Average Customer Review: 4.7 out of 5 stars 7 customer reviews

Best Sellers Rank: #448,220 in Books (See Top 100 in Books) #20 inÂ Books > Science & Math > Chemistry > Physical & Theoretical > Quantum Chemistry #1482 inÂ Books > Science & Math > Chemistry > General & Reference #1603 inÂ Books > Textbooks > Science & Mathematics > Chemistry

Customer Reviews

This review compares the five major SPECIALTY texts purchased by our Library Clients in the area of Molecular Bonding and Geometry. These five represent the most frequently acquired titles by university and graduate libraries, not public libraries. These exclude both general chem and p chem texts and small journal monographs on one narrow area. We recommend all five of these to our library buyers for different reasons.First, if you’re studying bonding and molecular geometry, don’t feel like you are dumb if it seems like a very tough subject. First, the field is rapidly changing from the old thermodynamic models to quantum models, and THE MAJORITY OF THIS FIELD IS NOT YET WELL UNDERSTOOD, EVEN BY EXPERTS. If you started learning shells and basic molecular geometry, and suddenly were asked to throw all that out and think in terms of probability sims and orbital clouds and shapes ala Schrodinger, you get my point! Most of the old "taxonomies" of chemical geometry are now being redone in this light, and none are near complete.We only understand the tip of the iceberg in how structure relates to FUNCTION today. When an inventor

makes a great discovery and has to describe it to colleagues, you often hear things like the word "intuition." Translate that as decades of experience that led the investigator to correctly "surmise" structure from function or vice versa, as the full functional complexity of bonding geometries are still even beyond supercomputing, although we're trying. If the investigator "saw" or deduced a reaction product or structure, it often comes down to a non-database function called experience.Five title comparison:Alison RodgerÂ Molecular Geometry1995, 190 pages, $25 average. Outstanding collection of monograph like geometries, organized roughly small to big, encompassing both inorganic and organic. The most practical of the group, ideal for industrial chemists trying to relate structure to function. High undergrad level math, not a lot of partial differential equations, some waveform math, but not a lot of quantum--much more practical in terms of the "intuition" mentioned above and by this husband/wife author team. Best overall presentation relating visuals to formulas. Not a "question answer" format, but still great for self study and especially reference. Content value well over $200, when copies dry up, this will cost hundreds aftermarket.Henry BentÂ MOLECULES and The Chemical BondThe other extreme in generality! This is known as the "Best of Bent" and although promoted as a 2011 title, is also a collection of Henry's wonderful explanations and musings from the 60's and 70's. Look up Bent's rule on the web and you'll see the deep expertise of this author in this area. This book covers much more than just bonding, including the philosophy of induction and invention. Is a true FUN read and page turner, covering the collective wisdom of an amazing career. 404 pages for $15 to $20, the best value of the group here. Up to date enough to cover the transition problems between thermodynamic and quantum models of bonding. VERY reader friendly.Harry GrayÂ Chemical Bonds1996, second edition, 232 pages, $12 to $25. Organized small to large molecule size. Perfect for self study. The ONLY text that attempts to explain this complex subject intuitively without calculus! Even accessible to beginning undergrads who are willing to put in the work. High schools students might find it daunting even without the calculus, INCLUDING Schrodinger! Still very up to date in orbitals, cloud shapes, valences, etc. This is a MUST HAVE in our library rankings, including undergrad and AP HS.LAST TWO: Ronald GillespieRon invented VSEPR theory, and is an acknowledged expert in this field. VSEPR and AXE go back to 1957, so Ron's first title specifically on the theory:Â The VSEPR Model of Molecular Geometry (Dover Books on Chemistry)Is now a Dover "classic" available for $10. Most of this info can now be found online, but for the price it is a great overview of a seminal approach.More recently (2001) Ron wrote the premier text in this field (288 pages, $60 to $150 and climbing):Â Chemical Bonding and Molecular Geometry: From Lewis to Electron Densities (Topics in Inorganic Chemistry)There is still no competing text that covers current work as thoroughly, unless you get

into journals costing $6,000 plus. Most of the chapters in general p chem texts refer to this. You can check ’s wonderful "citations" feature to spider out the relevant connections and bibs, however, as an adjunct to ANY bonding or geometry course in molecular chem you’re taking, this is a must. Less "practical" and more pedagogic than Rodgers. Needless to say, VSEPR is thoroughly covered too!Ron’s also written two more general intros:Â Atoms, Molecules, and Reactions: An Introduction to ChemistryÂ (available at this writing for .50c) andÂ ChemistryÂ (about $20 US).I’m a molecular biologist who researches RNA folding via supercomputing models.Library Picks reviews only for the benefit of shoppers and has nothing to do with , the authors, manufacturers or publishers of the items we review. We always buy the items we review for the sake of objectivity, and although we search for gems, are not shy about trashing an item if it’s a waste of time or money for shoppers. If the reviewer identifies herself, her job or her field, it is only as a point of reference to help you gauge the background and any biases.

I had always been a little bit disappointed with my undergraduate-level explanation of molecular orbitals. I was left with the impression that studying molecular orbitals was boring and dry, and was simply about memorizing the various shapes of possible electron clouds. This little book showed me how wrong I was.The text provided me with a deep and clear understanding of atomic orbitals. It did an amazing job of relating the shape and energy levels of the orbitals to the Schrodinger Equation without resorting to complicated equations (no calculus required). I recommend it to anyone who has ever sat in a general chemistry class and wondered if there was a deeper, richer way of understanding of chemical bonding and orbital shapes.

This is a great supplementary book for an introductory-level college chemistry course. It explains major concepts and theories in full detail, but refrains from the intense mathematical derivations of some functions that aren’t required for a general chemistry course. Gray uses a common-sense approach in tackling complex functions, visually showing their physical counterparts (such as orbitals in the case of the Schrodinger Equation) rather than relying solely on equations.

Liked the book! It is written by Professor Gray, emeritus Professor at Caltech. It is a brief book including some details about most of the chemical bonds. Nice material to learn(Gen Chem).

cheap Caltech text books

this was in great condition. I think I bought it new????

I did get some information from this book, but basicly it wasway over my head.

Chemical Bonds: An Introduction to Atomic and Molecular Structure Chaos in Atomic Physics (Cambridge Monographs on Atomic, Molecular and Chemical Physics) Atomic and Molecular Radiation Physics (Wiley Monographs on Chemical Physics) Light at Extreme Intensities 2011 (AIP Conference Proceedings / Atomic, Molecular, Chemical Physics) The Atomic Sea: Part Seven: The Atomic Jungle Understand Basic Chemistry Concepts: The Periodic Table, Chemical Bonds, Naming Compounds, Balancing Equations, and More Atomic and Electronic Structure of Solids Structure and Dynamics: An Atomic View of Materials (Oxford Master Series in Physics) Biological Inorganic Chemistry, Second Edition: A New Introduction to Molecular Structure and Function Biological Inorganic Chemistry: A New Introduction to Molecular Structure and Function The Nature of the Chemical Bond and the Structure of Molecules and Crystals: An Introduction to Modern Structural Chemistry Fundamental Aspects of Plasma Chemical Physics: Transport (Springer Series on Atomic, Optical, and Plasma Physics) Atomic Spectra and Radiative Transitions (Springer Series in Chemical Physics, Vol. 1) Molecular Symmetry and Group Theory : A Programmed Introduction to Chemical Applications, 2nd Edition Advanced Molecular Quantum Mechanics: An Introduction to Relativistic Quantum Mechanics and the Quantum Theory of Radiation (Studies in Chemical Physics) Molecular Symmetry and Group Theory: A Programmed Introduction to Chemical Applications Molecular Symmetry and Group Theory: A Programmed Introduction to Chemical Application Introduction to Chemical Engineering Thermodynamics (The Mcgraw-Hill Chemical Engineering Series) Fundamentals of Financial Instruments: An Introduction to Stocks, Bonds, Foreign Exchange, and Derivatives Solution Key for Algebra and Trigonometry: Structure and Method: Book 2 (McDougal Littell Structure & Method)