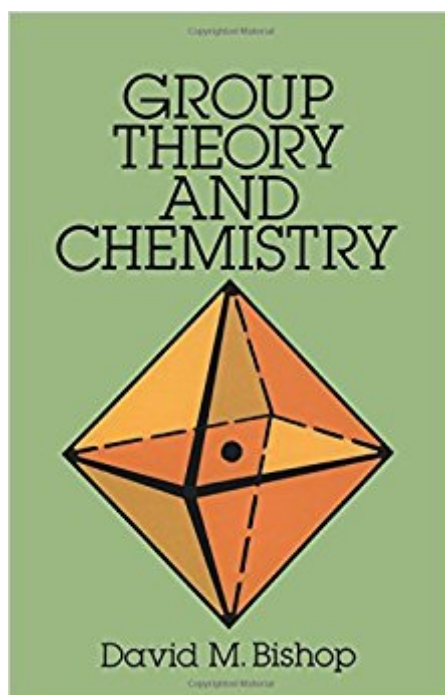


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Group Theory And Chemistry (Dover Books On Chemistry)



Synopsis

Group theoretical principles are an integral part of modern chemistry. Not only do they help account for a wide variety of chemical phenomena, they simplify quantum chemical calculations. Indeed, knowledge of their application to chemical problems is essential for students of chemistry. This complete, self-contained study, written for advanced undergraduate-level and graduate-level chemistry students, clearly and concisely introduces the subject of group theory and demonstrates its application to chemical problems. To assist chemistry students with the mathematics involved, Professor Bishop has included the relevant mathematics in some detail in appendixes to each chapter. The book can then be read either as an introduction, dealing with general concepts (ignoring the appendixes), or a fairly comprehensive description of the subject (including the appendixes). In any case, the author assures students that "the mathematics involved in actually applying, as opposed to deriving, group theoretical formulae is quite trivial. It involves little more than adding and multiplying."

Book Information

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Customer Reviews

This book begins with a chapter on symmetry and includes some nice pictures of symmetry from art and nature. The next chapter digs into point groups which are the sole concern of this book. You will find no material on space groups, let alone other groups, in this book. The next three chapters introduce matrices, along with basic material you will encounter in any linear algebra book, and matrix representations. The next two chapters dig into the theory of representations and character

tables. The rest of the book covers applications to chemistry including quantum mechanics, molecular vibrations, molecular orbital theory, hybrid orbitals, and transition metal chemistry. This book is absolutely not an introduction to quantum chemistry, and the student should definitely be comfortable with molecular orbital theory prior to attempting this book. I'd recommend Modern Quantum Chemistry: Introduction to Advanced Electronic Structure Theory (Dover Books on Chemistry) for this purpose. The text is quite good, but I found it physically difficult to read in spots due to the size of the typeface. The mathematics is presented with quite a bit of rigor, although one proof is flawed as it begins with an arbitrary square matrix...which is then diagonalized. But an arbitrary square matrix needn't be diagonalizable. The chapters typically end with a small number of exercises which are mostly pretty routine although some are labor intensive. There are also relatively few figures in the book, so it's quite dense.

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