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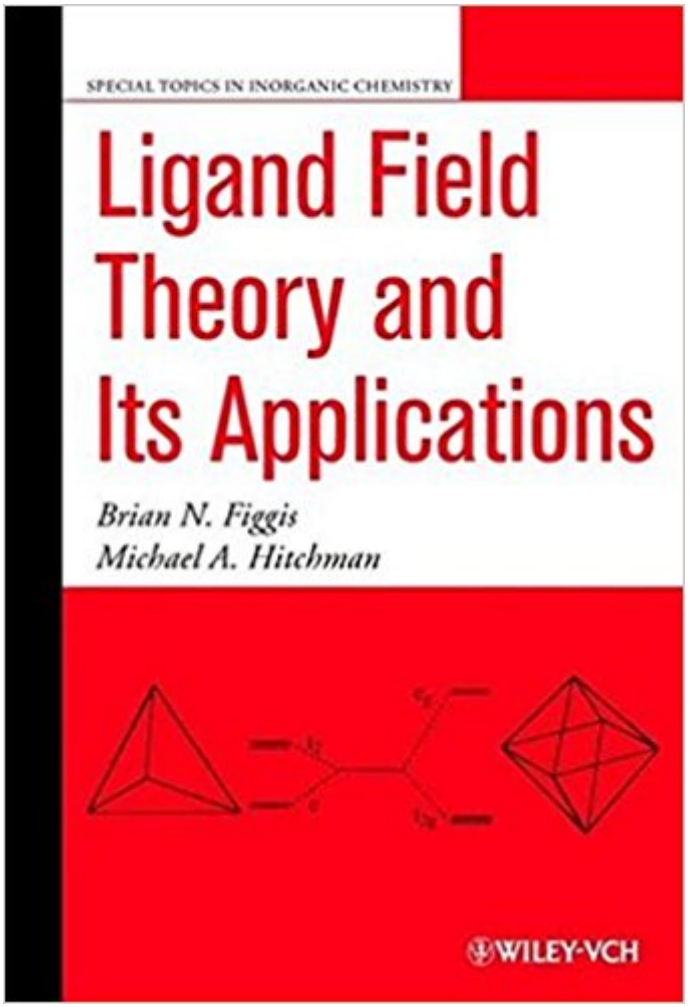
Ligand Field Theory And Its Applications



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Synopsis

A complete, up-to-date treatment of ligand field theory and its applications Ligand Field Theory and Its Applications presents an up-to-date account of ligand field theory, the model currently used to describe the metal-ligand interactions in transition metal compounds, and the way it is used to interpret the physical properties of the complexes. It examines the traditional electrostatic crystal field model, still widely used by physicists, as well as covalent approaches such as the angular overlap model, which interprets the metal ligand interactions using parameters relating directly to chemical behavior. Written by internationally recognized experts in the field, this book provides a comparison between ligand field theory and more sophisticated treatments as well as an account of the methods used to calculate the energy levels in compounds of the transition metals. It also covers physical properties such as stereochemistry, light absorption, and magnetic behavior. An emphasis on the interpretation of experimental results broadens the book's field of interest beyond transition metal chemistry into the many other areas where these metal ions play an important role. As clear and accessible as Brian Figgis's 1966 classic Introduction to Ligand Fields, this new book provides inorganic and bioinorganic chemists as well as physical chemists, chemical physicists, and spectroscopists with a much-needed overview of the many significant changes that have taken place in ligand field theory over the past 30 years.

Book Information

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Customer Reviews

According to the preface, the book of Figgis & Hitchman is a revised and extended version of Figgis' Introduction to Ligand Fields published in 1966. The book offers a modern approach to ligand field

theory (LFT) which is an extension of crystal field theory (CFT) developed in the 1930s by two giants, Bethe and Van Vleck. While CFT is concerned with the study of energy levels of single metal ions surrounded by a symmetric (octahedral, tetrahedral, etc.) arrangement of point charges, LFT includes additional effects that account for the covalent character of metal-ligand bonds. The objects of study of LFT are the coordination complexes of transition metals which are commonly investigated in inorganic and coordination chemistry. Although nowadays it is possible to perform accurate quantum mechanical calculations on such metal complexes, LFT is still important a tool for the possibility it offers to interpret both experimental and computational results. Two books that are historically important and still useful to the inorganic chemist are Ballhausen's Introduction to Ligand Field Theory (1962) and Griffith's The Theory of Transition-Metal Ions.

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