

EXAFS: Basic Principles and Data Analysis (Inorganic Chemistry Concepts)

By Boon K. Teo



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The phenomenon of Extended X-Ray Absorption Fine Structure (EXAFS) has been known for some time and was first treated theoretically by Kronig in the 1930s. Recent developments, initiated by Sayers, Stern, and Lytle in the early 1970s, have led to the recognition of the structural content of this technique. At the same time, the availability of synchrotron radiation has greatly improved both the acquisition and the quality of the EXAFS data over those obtainable from conventional X-ray sources. Such developments have established EXAFS as a powerful tool for structure studies. EXAFS has been successfully applied to a wide range of significant scientific and technological systems in many diverse fields such as inorganic chemistry, biochemistry, catalysis, material sciences, etc. It is extremely useful for systems where single-crystal diffraction techniques are not readily applicable (e.g., gas, liquid, solution, amorphous and polycrystalline solids, surfaces, polymer, etc.). Despite the fact that the EXAFS technique and applications have matured tremendously over the past decade or so, no introductory textbook exists. EXAFS: Basic Principles and Data Analysis represents my modest attempt to fill such a gap. In this book, I aim to introduce the subject matter to the novice and to help alleviate the confusion in EXAFS data analysis, which, although becoming more and more routine, is still a rather tricky endeavor and may, at times, discourage the beginners.



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EXAFS: Basic Principles and Data Analysis (Inorganic Chemistry Concepts) By Boon K. Teo Bibliography

Rank: #6667868 in Books
Published on: 2013-04-19
Released on: 2014-04-14
Original language: English

• Number of items: 1

• Dimensions: 9.21" h x .83" w x 6.14" l, .0 pounds

• Binding: Paperback

• 349 pages

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