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Book Review

Structural Methods in Inorganic Chemistry; by E.A.V. Ebsworth, D.W.H. Rankin, and S. Cradock, Blackwell Scientific Publications, 1987, xi + 456 pages, £13.50, ISBN 0-632-01603-5.

This book is designed to give an account of the wide range of modern techniques for the determination of the structure of inorganic compounds. The first chapter provides a general introduction and outlines the plan of the book. A most useful section is the glossary of terms used for spectroscopic and structural techniques. At present the number of such terms seems to be increasing rather rapidly, and few of us maintain the expertise in all the areas discussed to keep up. Subsequent chapters deal successively with different structural techniques.

Thus chapter 2 discusses NMR spectroscopy, considering first the broad range of magnetically active nuclei and experimental techniques. It continues by describing the information which may be obtained from chemical shifts, signal intensities, coupling constants, relaxation parameters, and nuclear Overhauser effects. Multiple resonance, multipulse methods and two dimensional NMR spectra are also discussed. Numerous applications are given in detail, including those involving gaseous, liquid crystalline, paramagnetic and solid samples and the monitoring of reactions in progress. Subsequent chapters follow a related pattern and include accounts of electron spin and nuclear quadrupole resonance spectroscopy, rotational, vibrational, electronic, photoelectron, and Mössbauer spectroscopy, as well as diffraction methods and mass spectrometry. All of the chapters are clear and well written, with enough background theory to use the technique, but without the detailed mathematical material under which even the most enthusiastic reader would tend to sink. However, in real laboratory practice, it is usually necessary to resort to a combination of techniques to characterise compounds. Chapter 10, devoted to case histories, redresses the balance in this area. The examples given are varied and well chosen, with something for main group and transition metal chemists, and those with interests in both organometallic and coordination chemistry. The book is completed with an appendix on symmetry; this is quite densely written and should probably be viewed more as a reference and an aid to memory than a primary teaching tool.

This work has been very well produced with a minimum number of errors. It is well-written, well-illustrated and well-referenced into 1986. Each chapter is provided with a set of stimulating questions, of value to student and faculty alike. There is both a subject and a compound index. The level of the book is that of an advanced undergraduate or graduate student; it should be compulsory reading for both these groups. I should add that it is probably the best value for money in this field for many years, and I would expect that all inorganic, and many organic, chemists will want a copy on their own shelves.

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