Vibrational Spectroscopy, 6 (1994) 379–382
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BOOK REVIEWS

Spectroscopic and Computational Studies of Supramolecular Systems, Vol. 4 in J.E.D. Davies (Ed.), *Topics in Inclusion Science*, Kluwer, Dordrecht, 1992 (ISBN 0-79-231-9583, Price Dfl.195.00). 301 pp.

The book spans the wide field from application of some experimental spectroscopic techniques to computational methods of molecular modelling and ab initio electronic structure calculations.

Some of the chapters are exceptionally well written, such as the very informative and well organized chapter on neutron scattering of zeolite complexes (E. Cohen de Lara and R. Kahn, France), the IR chapter (H. Förster, Germany) that is an excellent introduction for the newcomer into this field and at the same time a review on the latest literature, and the chapter on computational studies of zeolites (J.O. Titiloye et al., UK) that reviews computational methods and provides valuable detailed structural information. Further chapters are devoted to the power of NMR and NQR methods in the elucidation of host and guest structures, disorders, phase changes, the mutual guest–host interactions, guest mobility and host lattice relaxation in a variety of inclusion compounds, the channel structures of urea, thiourea and deoxycholic acid, clathrates, metal cyanide frameworks, macrocycles of crown ethers and calixarenes. One chapter describes the particular catalytic properties of molecular sieves for the conversion of methanol to hydrocarbons as studied by proton and ^{13}C NMR methods.

Chapter 7 through 9 describe theoretical and computational studies of cyclodextrines and their inclusion complexes, calixarenes, complex formation within zeolite structures ("ship in the bottle" type), and clathrate hydrates. Questions addressed include: What forces are responsible for complexation? What are the most favourable host–guest geometries? What, if any, correlation exists between geometry and reactivity? For the clathrate hydrates their structure, thermodynamical properties and the underlying current theory, the "cell theory", are described in detail together with some of the shortcomings of this theory. The 10th and last chapter of the book describes ab initio calculations concerning the most interesting endohedral complexes of the C_{60} cluster – also often called "footballene" or "buckminsterfullerene". The electronic properties of the cage, ionization potential, electric polarizability and the potential inside the cage, the endohedral effect, are presented. Stability conditions of a variety of endohedral complexes, including noble gases, metal ions and diatomic molecules, are tested and their predicted geometries calculated.

The book is a very interesting collection of modern aspects of "supramolecular systems" that contains literature collections up until 1992. There are many special details for the scientist working in this or in adjacent fields and there is a good proportion of introductory material for the interested graduate student.

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H.J. Pain, *The Physics of Vibrations and Waves*, Wiley, New York, 1993 (Paper: ISBN 0-471-937428, Price US$ 29.95; Cloth: ISBN 0-471-936197, Price US$ 79.95). 479 pp.

This book contains a very clear and full description of the phenomena connected with vibrations and with the most interesting types of waves. Sound and other mechanical vibrations and waves, electromagnetic waves in transmitting lines, in vacuum and in various media, specific demonstra-