

Book Reviews

George W. Gokel (Editor), *Advances in Supramolecular Chemistry*, Volume 1, 1990, Jai Press Inc. ISBN: 1-55938-181-7. £54.00/\$92.50.

It is always interesting to see the first volume of a new series of books, with the opportunity to try to guess how the subject, and the series, will progress in subsequent volumes. I have little doubt that the recent rise in prominence of supramolecular chemistry fully justifies the emergence of 'a research annual' (as the book describes itself); but how does this new series tackle the problem of covering the huge annual output of publications in this area? The answer, summarised in the foreword, is to "publish a series of essays on various relevant themes in the 80s written by workers who are active in the discipline." The result is four chapters of about 50 pages each, in which fairly specialist areas of supramolecular chemistry are discussed by recognised experts in their fields.

In terms of overall style and content, this was a book that really 'grew' on me. At first I was a little surprised and disappointed by the specific choice of topics (which didn't seem very close to my own area of research), but closer inspection has made me more enthusiastic than I was at first. It is perhaps a feature of supramolecular chemistry that apparently diverse aspects of the subject can turn out to have much in common, and I was pleasantly surprised to find that all of the chapters had sections that were very relevant to my own work on polycyclic peptides. However, I ought to say that the quality of some of the drawings and figures leaves a lot to be desired; without selecting specific examples, many of them are rather poorly reproduced, and some of them are almost unintelligible – surely modern publishers have word/structure processing packages that will allow them to do a better job than this.

But the contents of the chapters is the most important thing, and they did make fascinating reading. Chapter one, by Andrew Hamilton, looks at 'Hydrogen Bonding in Biological and Artificial Molecular Recognition'. In fact, the biological part hardly features, but the binding of (mainly) urea based compounds and DNA bases to specifically designed artificial receptors makes a very interesting story. Ian Sutherland's chapter on 'Synthetic Ditopic Receptors' was the one I most enjoyed reading, with elegantly chosen examples to illustrate the development of the area. Chapter 3, written by members of the Murakami group, is entitled 'Molecular Recognition by Macrocycles Having a Three-Dimensionally Extended Hydrophobic Cavity' – rather a mouthful of a title, but with lots of good chemistry, although I didn't find the style particularly digestible. And finally, 'Pre-organisation and Molecular Recognition in the Formation and Reactions of Binuclear Metal Complexes' by Arthur Martell; this is a very interesting topic, which was perhaps covered more systematically than any of the other chapters.

If you are wanting definitive reviews on topics of host–guest chemistry, then this probably isn't the book for you. Because it's fairly specialist, the price is quite

high – but even if none of the chapters are really in your field, it still makes very good and varied reading. For interesting overviews of selected aspects of supramolecular chemistry, this is a very good book that should evolve into a fascinating series.

P. D. BAILEY

University of York

T. Osa and J. L. Atwood (Eds.), *Inclusion Aspects of Membrane Chemistry*, Kluwer Academic Publishers, Dordrecht, 1991, pp. 290. ISBN 0-7923-1123-X

One of the main reasons for the enormous interest in synthetic and naturally occurring ionophores in recent years has been their ability to transport substrates, typically metal ions, through membranes. Many diverse experimental methods, membrane systems and ionophore types have been studied during the last fifteen or so years. This book attempts, in six intensively written chapters, to review this enormous field. In this it largely succeeds.

The first chapter: 'Ion extraction and transport by proton-ionizable crown ethers', by P. R. Brown and R. A. Bartsch, deals with the large numbers of synthetic crown ether-derived ionophores carrying acid groups and their complexation reactions with alkali metal ions at solvent interfaces.

The second chapter: 'Principles of artificial membrane transport of ions by synthetic ionophores', by T. M. Fyles, examines the general physical principles involved in ion transport across membranes. The appropriate equations for ion fluxes for a wide variety of different transport situations are developed and explained and appropriate examples are given.

In chapter three T. Kajiyama looks at polymer/(liquid crystal) composite membranes and in chapter four T. Osa and J. Anzai examine photocontrol of ion permeation through membranes and membrane potential. This latter chapter is of clear interest both to those interested in photocontrol from the biochemical side and to those interested in making photo sensitive devices.

The final two chapters: 'Electrochemical and photoelectrical properties of bilayer lipid membranes', by H. Ti Tien, and 'Electrochemistry of ionophore facilitated ion transport across liquid/liquid interfaces' are more concerned with traditional electrochemical techniques for the study of ion transport but do complement each other and also the earlier chapters.

It is of course difficult and probably impossible to cover this enormous field exhaustively in a single volume. The chapters are therefore selective in their choice of material. Personally I regretted the absence of any recognition of the impact that NMR spectroscopy has had on this field. Also, as a practising chemist in this area I found the first two chapters of greatest interest and utility. That being said, this is a very worthwhile contribution to the literature on the subject and should find its way onto the shelves of those many laboratories involved in this fascinating interdisciplinary area.

F. G. RIDDELL

*Department of Chemistry, The Purdie Building,
University of St Andrews, St Andrews KY16 9ST, U.K.*