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Pleasingly Upbeat and Positively Styled: Supramolecular Science for the Noughties

Michael Sherburn*

Introduction to Supramolecular Chemistry

By Helena Dodziuk

Kluwer Academic Publishers, The Netherlands.

December 2001, 364 pp.

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Introduction to Supramolecular Chemistry by Dr Helena Dodziuk of the Institute of Physical Chemistry, Polish Academy of Sciences, is a broad summary of chemical aspects of supramolecular science. On the back cover, the book makes the somewhat provocative claim to be ‘...the best method to get into the field’. At ca. 350 pages, this is more of a comprehensive monograph than a succinct primer. The book aims to be ‘...a brief, comprehensive and vivid presentation of the latest developments...’ and is directed at Ph.D. students, non-specialists and specialists. The author refers on several occasions to the difference between supramolecular chemistry and ‘classical organic chemistry’, which possibly reveals the targeted readership of the text more specifically. To a large extent this book achieves its purpose as an introductory text for the discipline and—with some reservations outlined below—I would list this text along with several others as a sourcebook for material for both postgraduate students and teachers. The subject areas are well chosen and the lists of references for further reading are comprehensive.

The introductory chapter sets itself the difficult task of defining the term ‘supramolecular chemistry’. The main body of the text is divided into seven major chapters. Chapters are devoted to molecular recognition and self-assembly, inclusion complexes, mesoscopic structures, modelling biological processes, nanotechnology, macrocyclic hosts, and other systems. Of these, Chapter 7, ‘The Most Interesting Macrocyclic Ligands Which Are Hosts For Inclusion Complexes’, weighing in at over 100 pages is considerably longer than the others, which are 20–40 pages in length. There is some duplication of material from one chapter to another (e.g. essentially the same attribute of the tobacco mosaic virus is mentioned on five occasions). The book finishes with a short ‘Future Prospects’ chapter. In addition to a lively and optimistic look into the crystal ball, a thought-provoking subdivision of supramolecular chemistry into three smaller areas is proposed. Comprehensive lists of

references to the primary literature are included after each chapter (literature to mid-2000 is cited) and the book contains a detailed index.

Supramolecular chemistry is an extraordinarily diverse field. In an introductory textbook of this length an author has to make a difficult decision: Does (s)he cover as much literature as possible, or should a small group of key papers be described in detail? Generally speaking, the former pathway has been followed here. Indeed, the book contains much interesting and important research in supramolecular chemistry and, furthermore, is written in a pleasingly upbeat and positive style. As the reader progresses through the book and is exposed to more and more examples of processes, functions, and features of supramolecular systems and their components, one can’t avoid being impressed by the depth of knowledge of the author. Some readers will be put off, however, by the lack of detail of many of the discussions. Nevertheless, the comprehensive bibliography serves as an excellent starting point for the interested reader to explore topics of interest more fully.

The literature of supramolecular chemistry is covered up to mid-2000. The majority of research discussed appeared in print in the 1990s. Key pre-1990 research findings are also mentioned but the emphasis is on more recent results.

The main weaknesses of the text relate to mistakes, both in the text and in the figures. Many chemical structures and equations either contain errors or are unclear. Thus, charges are missing (e.g. pp. 9 and 48), structures are labelled and named incorrectly (e.g. p. 37, hexamethylenetetramine is called atropine), stereochemistry is poorly represented (e.g. pp. 26 and 49), atom connectivity is not easy to ascertain (e.g. pp. 60, 101, and 107), and mechanisms are incorrect and incomplete (pp. 104 and 171). In addition, the text contains many grammatical and typographical errors. The monograph has clearly been written by someone whose first language is not English. In most cases, it is still relatively easy to get the gist of the story, e.g. p. 52: ‘In solution prevailing majority of inclusion complexes is present in the equilibrium with their free hosts and guests.’ In others, it is not, e.g. p. 47: ‘The complicated character of the depicted relations indicates that more factors (e.g. solvent effect) are at play in the ions recognition.’ For this reader, these problems diminish the impact of an otherwise useful textbook. In the hands of knowledgeable readers, mistakes will be recognized and the blanks can be filled in. For a reader with a weaker background, these errors could result in confusion.

The main strengths of this text are the broad nature of its content and the enthusiasm that the author has for the subject. Supramolecular chemistry continues to grow in influence despite having something of an identity issue. The lack of a precise definition for 'supramolecular chemistry' reflects the evolving and interdisciplinary nature of the subject, which is, of course, the origin of its strength. Dr Dodziuk should be commended for her efforts to

highlight the importance and untapped potential of this chemistry-based sub-discipline in science and technology.

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