

give the researcher deeper insights into mechanisms. This is a shortcoming of the book, especially since new fundamental understanding of the effects and mechanisms of different classes of additives has been obtained by spectroscopic methods during the last few years.

This book offers the following readers a quick introduction to this field of work: laboratory technicians involved in monitoring and evaluating lubricants, plant maintenance people for whom lubricants are an element in process technology, research and development people who have to deal with friction and wear, engineers for whom lubricants are functional elements and factors influencing the service life of machinery etc., and (increasingly important) safety and environmental protection officers who are responsible for workplace safety, for economical use of resources, and for the reduction or avoidance of emissions and wastes.

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Self-Assembly in Supramolecular Systems. By Leonard F. Lindoy and Ian M. Atkinson. (Series: Monographs in Supramolecular Chemistry; series editor: J. Fraser Stoddart.) Royal Society of Chemistry, Cambridge 2000. x + 224 pp., hardcover £ 69.50.—ISBN 0-85404-512-0

To cut a long story short: the new monograph *Self-Assembly in Supramolecular Systems*, by Lindoy and Atkinson, is a crude mixture of examples from this fascinating area, rather than the survey of highlights claimed by the authors in the preface. At first sight, the table of contents seems promising: the first chapter, “Self-Assembly: What Does it Mean?”, comes with a philosophical touch, and leads the reader to expect a thorough definition. Unfortunately, no distinction is made between “self-assembly” and “self-organization”, and there is no proper introduction to central concepts such as preorganization, templates, or cooperativity, even though these terms are used later in the

text. Furthermore, a precise discussion of entropy (only one entry in the index) and enthalpy would have been valuable, but is absent.

In contrast, the second chapter with its short but informative introduction to the different types of intermolecular forces is certainly worth reading by anyone seeking a brief overview. However, in view of the extensive discussion of metal-containing systems in the last two chapters, it would have been useful to include a discussion of metal–ligand bonds and their different geometries, allowing one to compare the bond strengths with other forces.

Unfortunately, with the third chapter and those that follow, the authors depart from their hitherto logical concept. Chapter 3 on “Hydrogen-Bonded and π -Stacked Systems” is concerned with the type of interaction, whereas Chapters 4 (“Rotaxanes”) and 5 (“Catenanes”) are organized according to topology, and Chapter 6 (“Metal-Directed Synthesis”) deals with synthetic aspects. Some of the most important examples relating to the latter topic, namely the metallomacrocycles and capsules studied by Fujita, Stang, and Raymond, have been shifted to the final chapter. Its title, “Further Metal-Containing Systems”, relegates them to the lesser importance of any “miscellaneous” chapter. The distinction of hydrogen-bridged and π -bonded assemblies of Chapter 3 is similarly inconsistent: self-replicating systems, which are defined by a functional property, comes at the end of the structure-based organization into simple, cyclic, cylindrical, and spherical assemblies. This section would fit better into the one-paragraph Section 3.2.2 “Molecular Assembly as Reaction Template”. The only examples of self-replication cited are from the older work by Rebek, ignoring the artificial minimum models from the Kiedrowski group, Ghadiri’s self-replicating peptides, and Orgel’s pioneering ideas.

The third chapter also contains some annoying mistakes: the Rebek capsules **28** and **31** (pp. 38 and 40) are identical with the exception of the solubilizing side-chains, which are of minor importance for assembly. A similar unnecessary duplication occurs for the softball **30/33b**; as can be seen easily from computer models, both structures repre-

sent the same molecule—shown with two different formulas that are both wrong, due to missing double bonds in the middle of one and the omission of a nitrogen atom in the other. It is unclear to me why the two MM2-optimized structures differ at all. Certainly, the length of the hydrogen bonds in **33** is not reasonable. The text also contains repetitive passages on the softballs, leaving the impression of a lack of care during the preparation of the book.

Mechanically bound molecules, i.e., rotaxanes, catenanes, and knots, are distributed diffusely through Chapters 4 and 5, with their somewhat imbalanced focus on Stoddart’s work, as well as in 6.2 and 6.7. The book would surely benefit from a consistent organization according to the various template effects used in synthesizing rotaxanes and catenanes. Treating rotaxanes and catenanes of the same types together would also have avoided repetitions, saving space for a more precise and in-depth discussion.

The authors hope to reach a broad readership, from senior undergraduates and newcomers to the field to experienced supramolecular chemists. Although seemingly easy to read, the book implicitly demands too much for understanding by undergraduate students, so that they will either find it difficult to extract the information, or will form only a superficial view of the highly interesting chemistry presented here. The newcomer may make use of the many references including literature up to the end of 1998 (a few reviews from early 1999 have also been included). The authors should have updated the references immediately before the book went into print. Finally, the expert will not learn much from the book, since the basic ideas lack thorough discussion.

Although I was at first enthusiastic about a new book with a focus on self-assembly, I have considerable reservations about recommending it. Many passages lack the care without which the book will not be a joy to read. The more I studied the text, the greater my disappointment. What a pity about the missed opportunity!

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