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Book review

Orbital interaction theory of organic chemistry
Arvi Rauk
2nd edn.
John Wiley & Sons, Ltd, Chichester, 2001
xv + 343 pages. £67.50
ISBN 0-471-35833-9

The first edition of this book, published in 1994, sat uneasily in the gap between the understanding of organic chemistry of a synthetic organic chemist and the understanding of a theoretician. The few books that attempt to bridge this gap seem to find themselves erring to one side or the other, my own leaning heavily towards the former, and most of the others, including this one, leaning towards the latter. This edition is like its predecessor in this respect, not least in its appearance — the mathematics is presented with typographical consistency and elegance, whereas the chemical structures are drawn with varying degrees of clarity, bond-thickness, size, orientation, and with a variety of type sizes and typefaces. Of course, none of this matters if the point is made clearly, and by and large it is.

It smoothly covers stereochemical descriptions, the nature of orbitals, and how to treat their interaction, both within molecules and when one molecule combines with another. It identifies the electronic nature of substituents, and shows how they affect the reactivity of molecules to which they are attached. It then covers a wide range of chemical structures, reactions and phenomena, discussing each in terms of the orbitals involved, including a chapter on organometallic bonding and orbital considerations in the fundamental reactions of transition-metal organometallic chemistry.

I cannot, however, say that this is the book to read if you want to understand how theory applies to organic and organometallic chemistry, unless you are already of a theoretician's persuasion and want to see what the chemistry is. For anyone more of an organic or organometallic chemist, it needs, and presumably will get, an instructor giving a course of lectures alongside it. For that purpose, this could be a useful book, for it does cover a satisfyingly wide range of chemistry, enlarged in this edition from the first, and with the most mathematical parts moved out of the main text into an appendix.

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