

Electron transfer reactions in organic chemistry; by Lennart Eberson, *Reactivity and Structure Concepts in Organic Chemistry*, Volume 25, Springer Verlag, 1987, xiii + 234 pages, DM128, ISBN 3-450-17599-7.

Mechanistic organic chemistry has long been dominated by the conventional curly arrow, indicating the movement of two electrons, and the idea of electron transfer (ET) has been relatively slow to appear. However, recent research, particularly in the areas of biological and organometallic chemistry, electrochemistry, and photochemistry should have convinced us that this phenomenon is much more widespread than we might previously have suspected. The author notes in his preface that he does not intend to deal with biological or organometallic electron transfer and with few exceptions he does not do so.

The first three chapters of the book are essentially introductory, dealing with concepts and definitions to be used later. Chapter 4 embarks on a detailed treatment of the Marcus theory; this is careful and clear but very definitely hard going for an experimentalist who is more accustomed to a descriptive approach. Chapter 5 will be of very general interest, dealing with the experimental methods which are used to investigate electron transfer processes. The examples chosen include a number of organometallics, notably tin and lithium reagents. The subsequent chapters discuss the main types of electron transfer reactions. Of particular interest to the organometallic chemist will be the account in Chapter 7 of metal salts as single electron oxidants and in Chapter 8 of alkyllithiums and Grignard reagents as ET reagents. The other topics considered include reactions between organic and inorganic non-metallic species, electrochemically and photochemically promoted ET, and electron transfer catalysed reactions.

The final two chapters of the book are again fairly general in character. Chapter 11 considers the relationship between polar and ET mechanisms and discusses the difficult questions of where to draw the demarcation lines, and the extent to which such lines are significant. In the final chapter some of the uses of ET reactions are reviewed, with the important areas of organic conductors and solar energy storage perhaps being the most topical items.

Like all books from this publisher this volume is well produced with only a few errors. The diagrams are clear and mostly attractive, if a little variable in size, a fact which is presumably attributable to the editors' "fitting in" of the author's originals. The work is well referenced into 1986, and each chapter has an update which has been added at the proof stage describing the most recent developments in the area. These will be interesting to the expert, but seem a little laconic for the browser. In short this is an interesting and well presented work on an important subject. It contains little organometallic chemistry but should be of general interest and should be purchased by serious chemistry libraries.

*School of Chemistry and Molecular Sciences
University of Sussex, Falmer, Brighton (Great Britain)*

Penny A. Chaloner