

Book Reviews

K. Fukui: Theory of Orientation and Stereoselection, Vol. 2 of "Reactivity and Structure – Concepts in Organic Chemistry". Berlin–Heidelberg–New York: Springer-Verlag 1975. 134 pp., price: US-\$ 18.10 (DM 44.–)

This book is an up-to-dating of an article by Fukui in *Topics in Current Chemistry*, Vol. 15, June 1970. It is considerably expanded and has a number of new examples, including some from the field of catalysis by transition metal complexes.

Essentially the new version is a detailed presentation of Fukui's frontier orbital approach for the prediction of favorable reaction paths in chemical reactions. There is an equal division between the theory in mathematical form and its application to examples, usually taken from organic chemistry. In some cases rather extensive calculations have been made by Fukui and his coworkers. In other reactions, only qualitative arguments are given. However these nicely illustrate the power of the simple rules that Fukui has developed, such as maximum overlap of the HOMO and LUMO.

There is perhaps too much emphasis on these frontier orbitals, since they need not always be the critical orbitals, according to both theory and experiment. Fukui's method is based on perturbation theory applied to interacting molecules. He attempts to prove that the correlation diagrams of Woodward and Hoffman are not useful, but this does not appear to be very convincing.

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