

Book review

Catalysis, Science and Technology, Vol. 6; edited by J.R. Anderson and M. Boudart, Springer-Verlag, Berlin, Heidelberg, 1984, ISBN 3-540-12815-8, pp. 312 + viii, DM 132.

This series continues to be of somewhat mixed interest as far as organometallic chemists are concerned. The current volume contains reviews on catalyst activation and deactivation (J.B. Butt) and dispersed metal catalysts (K. Foger) which are not very organometallic in content, though the latter does discuss the relevance of cluster chemistry to dispersed metal systems. However, two other reviews, on catalytic olefin polymerisation, by I. Pasquon and U. Giannini, and on metal-catalysed reactions of hydrocarbons on metal catalysts, by G.L.C. Maire and F.G. Garin, are much more to the point, though neither review is written from the position of an organometallic chemist.

The first of these is a mammoth effort with nearly 500 references, which commences with a summary of olefin-polymerisation catalyst systems and their typical products. There follows a discussion of kinetics and the mechanisms inferred from them, though these are presented more in summary than in detail. Both homogeneous and heterogeneous systems are discussed. The last two sections, on polymerisation processes and on commercial polymers, are primarily discussions of applications. This review will be a valuable source of the less academic material which is, however, necessary for a proper appreciation of how chemistry is actually used. It will benefit both teaching and research.

The second review deals with rearrangements such as occur in hydrocarbon cracking. First the kinds of reactions observed are considered, then skeletal reaction mechanisms are summarised and the techniques used to establish them are discussed. There follows a review of mechanisms for bond shifts, such as in the conversion of isopentane to n-pentane, for hydrogenolyses such as of methylcyclopentane to n-hexane, and for reactions involving carbon-carbon bond rupture. The last part of the review discusses the dependence of these reactions upon the catalyst, its constitution, structure, and particle size, broaching the problem of clusters, both homometallic and heterometallic, as catalysts.

In summary, this book contains much of value to the organometallic chemist, and will certainly repay some study. However, as with others of the series, only the more affluent would want to buy it for themselves.