

Catalysis, Science and Technology, Vol. 7; edited by J.R. Anderson and M. Boudart, ISBN 3-540-15035-8, Springer-Verlag, Berlin and Heidelberg, 1985, DM 132, x + 222 pages

This seventh volume of a series planned to run to about twelve volumes continues with its plan of presenting authoritative and definitive accounts of the main areas of pure and applied catalysis. Consequently, it is not replete with material likely to be of vital direct interest to organometallic chemists. This volume is concerned with physical techniques and the understanding of heterogeneous catalysis. Complex compounds rate barely a mention.

The first of the three Chapters is on the history of the catalytic fixation of ammonia (S.A. Topham). This is a full, fascinating and valuable account which will be useful for general education and teaching for some time to come. Chapter 2 concerns the electron microscopy of catalysts (J.V. Sanders), This surveys the range of techniques in use, and the kind of information each can give. It concludes with a section on applications. With 439 references, it is a massive compilation, and its thrust is really the methods of study of surfaces rather than of catalysts in particular.

The final Chapter, on surface structural chemistry (B.E. Koel and G.A. Somorjai), starts with a discussion of surface structure and how it is determined, then goes on to the structure of adsorbed atoms, and finally deals with adsorbed molecules and the surface chemical bond. Most work has been done with CO, which is of less interest to organometallic chemists. Benzene binds to Rh in orientations involving many metal atoms with each ring. There does not seem to be a single simple half-sandwich. Alkenes apparently bond to metal surfaces forming two σ -bonds, whereas CH, CH₂ and CH₃ form three, two and one metal-carbon σ -bonds, respectively. However, the heats of adsorption of CO on Pt, depending on site, differ by more than 50 kJ, so that there cannot be a single kind of adsorption.

This book is valuable for reference, for information, and for background. Organometallic chemists should have access to it in libraries, but I doubt whether many could justify buying their own copies.

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