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Book reviews

Advances in Catalysis, Vol. 28, Edited by D.D. Eley, H. Pines, and P.B. Weisz, Academic Press, New York, London, Toronto, San Francisco, 1979, xi + 403 pages, $52.00.

This volume continues in the fine tradition of earlier volumes. It covers several of the most topical and important aspects of catalysis research in five detailed and useful reviews. That by T. Engel and G. Ertl (78 pp.) discusses in considerable quantitative detail the adsorption and oxidation of carbon monoxide on platinum metal surfaces, a highly topical subject in view of the desire to remove carbon monoxide completely from car exhausts. It is also one which is very rewarding scientifically owing to the easy observation of carbon monoxide on metal surfaces by modern spectroscopic techniques. Advances over the past 10 years in the understanding of the oxidation of carbon monoxide on platinum occupies most of the review, but the recent and less advanced studies of its oxidation on Pd, Ir, Ru and Rh are included. The above review is complemented by another by R. Eisenberg and D.E. Hendriksen (94 pp.) concerning particularly homogenously catalysed reactions of CO, CO_2 and NO, and especially the important reactions involving reduction or oxidation of carbon monoxide. It also considers the chemistry of carbon monoxide complexes and, less important, the bonding of nitric oxide to metal ions and its catalysed reactions.

In the third review M.I. Temkin provides a detailed resumé of his very thorough kinetic studies of several industrially important heterogeneous catalytic reactions (119 pp.), oxidation of ethylene to ethylene oxide, the reaction of methane with steam, ammonia synthesis and oxidation, etc., affording a prime example of the application of mathematics to the study of catalytic processes. This is followed by S.M. Csecsery's review (28 pp.) of the advances arising from the study of the molecular mechanism of dehydrocyclisation of alkylaromatics, mainly by platinum supported on alumina or silica gel, and of the reactions which accompany the cyclisation.

The final review concerns metalloenzyme catalysts and is by J.J. Villafranca and F.M. Raushel (46 pp.). This enormous subject is illustrated with reference to the enzymes thermolysin, yeast hexokinase, and glutamine synthetase. Kinetic, spectroscopic, X-ray structural and ion substitution methods are discussed as well as the use of model compounds. It is a concise, easy to read, review which can be recommended to anyone wishing to acquire quickly an outline of current methods of enzyme study.

The volume has a good author and subject index, is well presented and concludes with a list of contents of the previous 27 volumes in the series.

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