

## BOOK REVIEWS

**Handbuch der Katalyse.** Edited by G.-M. SCHWAB, München. Fünfter Band: Heterogene Katalyse II, Bearbeitet von J. BLOCK, P. BROVETTO, F. H. CONSTABLE, A. G. NASINI, G. NATTA, H. NOLLER, R. RIGAMONTI, G. SAINI and G.-M. SCHWAB. Springer-Verlag, Molkerbastei 5, Wien 1, Austria, 1957. vi + 779 pp. 18 × 25 cm. Price, \$43.80; ganzeinen, \$44.75.

G.-M. Schwab conceived the plan for the "Handbuch der Katalyse" prior to the Second World War. It was to be a truly comprehensive treatment of the subject of catalysis on adequate scale. Seven volumes were projected: 1, Allgemeines und Gaskatalyse; 2, Katalyse in Lösungen; 3, Biokatalyse; 4, Heterogene Katalyse I; 5, Heterogene Katalyse II; 6, Heterogene Katalyse III; and 7, Katalyse in der Organischen Chemie. It was planned that all volumes would be published in the course of the shortest possible period and in this the distinguished editor was almost successful in spite of great difficulties for six of the seven volumes appeared between 1940 and 1943. But the exigencies of the war finally prevented the publishing of volume 5. The "Handbuch der Katalyse" was considered so important that it was published as a reprint in this country by Edwards Brothers, Inc., Ann Arbor, Michigan, 1945. Many sets are in use in English speaking countries but both here and in Germany the lack of this key volume has been keenly felt. In preparing this volume the original 1943 manuscripts have been revised and brought up to date by the original authors in preparing the four chapters of the present volume. The publication of this volume, even after fourteen years, is therefore welcome.

Chapter 1 (140 pages) Adsorption und Allgemeines über mono- und mehrmolekulare Schichte (Adsorption and General Considerations concerning Mono- and Polymolecular Layers) by A. G. Nasini, G. Saini and P. Brovetto all of Turin. The last two decades have produced a great development in the understanding of the nature of adsorption both physical and chemisorption. This development is competently reviewed in its aspects of technique, theory and literature. The great contributions of Emmett, the mathematical development of the isotherms of Brunauer, Emmett and Teller, of Harkins and Jura, of Langmuir, of Huttig, and of others are presented and compared both as to precision, ease of use, and theoretical soundness.

Chapter 2 (19 pages), Active Centers from the Point of View of Kinetics (English) by F. H. Constable of Istanbul. Much controversy has centered around the subject of this chapter. The author as an eminently qualified protagonist, has an important point of view to present. It is to be hoped that the article will stimulate further work, particularly since modern solid state theory and techniques should make this field more fruitful.

Chapter 3 (252 pages), Kinetik der heterogene Katalyse (Kinetics of Heterogeneous Catalysis) by G.-M. Schwab, H. Noller and J. Block all of Munich. This article comprises a theoretical portion (69 pages) and an applied section (187 pages). Since even the theoretical portion is liberally illustrated with applications, this article is basically a survey of the application of reaction kinetics to numerous examples of heterogeneous catalysis. The article features an 8-page table of energies of activation for various catalyzed heterogeneous reactions. Only in isolated cases are the proposed kinetics evaluated.

Chapter 4 (332 pages), Die Mischkontakte (Composite Catalysts) by G. Natta and R. Rigamonti. From personal practical use the reviewer can recommend this chapter as a key to the unwieldy but essential published literature on the preparation and effectiveness of simple and composite catalysts. Much of the data is organized into 103 convenient tabulations. Although not exhaustive, this review contains all the major articles down to 1955. The review is particularly helpful because the catalysts are classified according to crystallographic and solid state concepts.

While the author index appears small (26 pages) for the massive bibliographic material, (more than 5,000 citations) to be found in the footnotes, there seem to be no omissions.

The 3-column format makes for condensation and easy scanning. The subject index (10 pages) in two column format seems a little inadequate for a volume of this size. Tabular entries, for example, are not indexed which means that some tables must be scanned for specific topics.

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**Heat Transfer.** Volume II. By the late MAX JAKOB, Research Professor of Mechanical Engineering, Illinois Institute of Technology, Consultant in Heat Transfer, Armour Research Foundation, Consultant in Heat Transfer, Purdue University. With the technical and editorial assistance of STOTHE PETER KEZIOS, Associate Professor of Mechanical Engineering, Illinois Institute of Technology. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, New York. 1957. xxxii + 652 pp. 15.5 × 23.5 cm. Price, \$15.00.

Volume I of this two-volume treatise was published in 1949. Dr. Jakob's untimely death in 1955 occurred before the present volume was completed. His associate, Dr. Kezios, prepared the manuscript from Dr. Jakob's notes. He has accomplished this unselfish task skillfully and well.

Volume I, which has taken its place as an important contribution to the literature of engineering science, covers the basic concepts and fundamental topics of heat transfer by radiation, conduction and convection. The present volume deals primarily with selected special topics. The first two chapters cover radiation between surfaces and through absorbing media. This material properly is an extension of the chapters on radiation in volume I. The remaining sections are on new topics. Although the possessor of the present volume undoubtedly will wish to have volume I also, volume II may be read independently of the earlier volume and is quite self-contained.

The fields selected for detailed treatment are: heat transfer in thermometry; ordinary heat exchangers (regenerators); regenerators; cooling towers; cooling by falling liquid films; cooling of surfaces exposed to hot gases; heat transfer through laminar and turbulent boundary layers at high velocities; heat transfer in liquid metals; and steady state heat transfer in packed columns. A series of short supplementary chapters bringing up to date the material in the corresponding chapters in volume I is added. Finally, appendices containing problems, tables of nomenclature and conversion factors, references and index complete the text.

All of the chapters in this book have certain common characteristics. The subject of the chapter is introduced generally and placed in perspective with heat transfer as a whole. Historical sources are carefully given and priorities fairly assessed. The mathematical theories from important publications are thoroughly and carefully presented and reviewed. For the most part, these discussions are arranged in historical order. The best experimental data are presented and analyzed. The emphasis of the book is somewhat more on mathematics than on experiment. Material from many sources has been organized and presented in a remarkably consistent manner. The nomenclature, although somewhat complex and individualistic, is not difficult to follow. The entire treatment is scholarly.

The chapters on thermometry, regenerators, cooling of surfaces exposed to hot gases, heat transfer at high velocities, and heat transfer to liquid metals, are among the most complete and authoritative treatments of these subjects in English. The remaining chapters are at the same level of thoroughness but other well known publications also have covered these situations.

Jakob's "Heat Transfer" is not a textbook for the uninitiated. Although it has a collection of problems to be worked, there are no illustrative examples given in the text. The book is for the scholar, for the research specialist, and