

## BOOK REVIEWS

**Particulate Clouds: Dusts, Smokes and Mists. Their physics and physical chemistry and industrial and environmental aspects.** By H. L. GREEN, M. A. (Cantab), F. Inst. P., and W. R. LANE, B. Sc. (Birm.), F. Inst. P. D. Van Nostrand Company, Inc., 126 Alexander Street, Princeton, New Jersey. 1957. xix + 436 pp. 16 × 25.5 cm. Price, \$11.25.

The authors of this volume are among the foremost investigators in their field. Their work has been conducted at the British Chemical Warfare Establishment at Porton, England. Although they have been concerned primarily with military aspects of toxic and obscuring clouds, their interests have been far larger than this. As is too often the case, the many noteworthy achievements of the Porton Establishment have been given little acknowledgment outside military circles, although many of these achievements have been translated by others into useful civil application.

The field is of increasing civilian interest as exemplified by the current underspread concern with smog, lung cancer, cigarette smoking, radioactive fallout and similar problems. There are many declassified military findings which would be of great value here to governmental and industrial investigators. Unfortunately these findings are widely scattered. Some excellent collections have been made, for example, that on "Aerosols," for the U. S. Atomic Energy Commission, but these are still too specialized to provide an adequate general background in the subject.

This book is an attempt by the authors to collect necessary basic knowledge on behavior of certain particulates and to systematize the known industrial and environmental applications. In this they have succeeded admirably. Part I is perhaps the best presentation this reviewer has seen of the physical and chemical properties of particulate clouds. The experimental techniques described are well chosen and well presented. Mathematical treatments are used where appropriate, but the text and illustrative data are sufficient to make the section invaluable to those with little background in mathematics.

Part II of the book deals with selected industrial application, with particular emphasis on health hazards and atmospheric pollution. Perhaps because of the authors' own limited backgrounds, this section is not as broad in coverage as some users of the book might desire. However, sufficient supplementary references are supplied to take care of most special requirements. The large number of references in British publications should be especially useful to American workers.

One minor critical comment: Where British and American opinions differ, the authors unduly stress their own positions. But this is a minor note, and certainly is not reflected in the factual bases of the book.

U. S. ARMY CHEMICAL WARFARE LABORATORIES  
ARMY CHEMICAL CENTER, MARYLAND SAUL HORMATS

**Methoden der Organischen Chemie (Houben-Weyl).** Vierte, Völlig Neu Gestaltete Auflage. Unter Besonderer Mitwirkung von O. BAYER, Leverkusen, H. MEERWEIN, Marburg, and K. ZIEGLER, Mülheim. Band I/1. Allgemeine Laboratoriumspraxis. Edited by EUGEN MULLER, Tübingen. Georg Thieme Verlag, (14a) Stuttgart, Herdweg 63, Germany. 1958. xlii + 1048 pp. 18.5 × 26 cm. Price, DM 198.—(Subskriptionspreis DM 178.20).

The number of manipulative methods comprising the art of actual laboratory work with organic compounds has increased to the point where the editors of the new "Houben-Weyl" are devoting two half-volumes to such procedures, not including the bulk of the physical methods of investigation that are dealt with elsewhere. The first half-volume (I/1) "General Laboratory Practice" is now at hand.

In general the discussions pertain to gram-scale preparative work and are in many instances extended to operations of pilot-plant size. This is particularly true of manipulations like filtration, pressing, solvent extraction, adsorption, drying, distillation, evaporation, centrifugation. Com-

mercially available pieces of equipment referred to are, not unexpectedly, of preponderantly continental manufacture, which detracts somewhat from the interest to an American reader.

An unusual but welcome feature consists in the inclusion of several chapters that convey knowledge useful for the establishment and maintenance of laboratories and equipment: laboratory glass and its properties; assembly of glass apparatus; the use of ceramics, plastics and metals in the laboratory; cements and glues; general notes on laboratory planning. Even though much of this is directed at European readers, there is a great deal of generally useful information to be found here.

Space does not permit reference to all of the subjects covered, but mention will be made of chapters that seemed to have particular interest. A. Lüttringhaus' contribution on "Crystallization" endeavors to present in systematic form the manifold methods and tricks by which chemists have coaxed molecules to arrange themselves in the orderly fashion of a lattice. A unique presentation of the use of inclusion compounds is given by W. Schlenck, and a chapter by F. Cramer and O. Bayer on the use of complexes and molecular compounds will be welcomed by many. G. Hesse has dealt with chromatography and K. Bratzler with gas adsorption. Gas chromatography has advisedly been omitted, until "its development for preparative purposes has been achieved." Ion exchange is treated in an extensive chapter by R. Griessbach and S. Naumann, and the more recently developed redox resins are discussed by A. Manecke. A thorough discussion of extraction and multiplicative distribution in columns or batches is given by O. Jüermann. Electrophoresis in its preparative aspects is described by W. Grassmann and K. Hannig.

Throughout the work, the theoretical principles for each method are clearly set forth to enable the reader intelligently to apply the practical examples to his own problems.

An American chemist may find much of the material in this volume well covered in indigenous monographs or treatises, but some of the chapters mentioned above appear to be unique and will surely be an asset to any library. In addition, perusal of the book permits one to catch a glimpse of how things are done in various laboratories, a privilege generally enjoyed only by the traveller. Part 2 of the volume ought to constitute an interesting continuation of this vicarious journey.

RESEARCH DEPARTMENT  
CIBA PHARMACEUTICAL PRODUCTS INC. HANS HEYMANN  
SUMMIT, NEW JERSEY

**Catalysis. Volume V. Hydrogenation, Oxo-Synthesis, Hydrocracking, Hydrodesulfurization, Hydrogen Isotope Exchange and Related Catalytic Reactions.** Edited by PAUL H. EMMETT, W. R. Grace Professor of Chemistry, The Johns Hopkins University, Baltimore, Maryland. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1957. vi + 542 pp. 16.5 × 23.5 cm. Price, \$15.00.

This volume, according to the preface, is the last of the volumes dealing with hydrogenation. It contains six chapters written by the following authors: U. Colombo, J. B. McKinley, G. Natta, M. Orchin, I. Pasquon, H. Smith, H. W. Sternberg, T. I. Taylor and I. Wender.

The first chapter "Reactions of Carbon Monoxide" (73 pages) does not deal with hydrogenation reactions but contains a comprehensive survey of reactions of carbon monoxide with hydrocarbons, alcohols, ethers, etc., catalyzed by acids and bases.

Chapter 2, 58 pages, contains an enlightening discussion of the mechanism of the Oxo reaction.

Chapter 3, 48 pages, contains a discussion of catalytic syntheses of higher alcohols from carbon monoxide and hydrogen.

Chapter 4, 82 pages, summarizes work done on hydrogenation of benzene, pyrrole, pyridine and quinoline nuclei.