

The editor's preface admits the existence of problems of overlap and repetition in cooperative treatises of the nature of this volume. However, the overlap in many chapters of the present volume is so extensive as to hardly appear justifiable under any conditions: An author who would undertake to rewrite the entire volume could probably achieve this in no more than half the space used. While it is completely unrealistic to suggest that the editor should have done this, one must wonder if he should not have used his "good offices" and his scientific stature to effectively dissuade redundancy and to revise or eliminate the obviously inferior contributions.

In conclusion, several chapters of this book represent outstanding contributions of permanent, scientific value in the general area of rheology. Several others represent extremely useful contributions to a given area of industry. It is perhaps unfortunate that the interested reader will have to pay a nearly prohibitive price simply because the editor also chose to include an equal amount of material which is either redundant or of minor scientific value.

DEPARTMENT OF CHEMICAL ENGINEERING
UNIVERSITY OF DELAWARE
NEWARK, DELAWARE
A. B. METZNER

Aliphatic Fluorine Compounds. ACS Monograph No. 138. By A. M. LOVELACE, DOUGLAS A. RAUSCH and WILLIAM POSTELNEK, Organic Materials Branch, Materials Laboratory, Wright Air Development Center. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1958. ix + 370 pp. 16 × 23.5 cm. Price, \$12.50.

The Monograph on "Aliphatic Fluorine Compounds" by A. M. Lovelace, Douglas A. Rausch and William Postelnek is an excellent reference book for this broad class of compounds. The approach to the subject is primarily from the point of view of preparative organic chemistry. In general, the arrangement of the subject matter is similar to that of the classical treatises on organic chemistry. Although the first chapter is devoted to fluorinating agents and methods, the remaining chapters are concerned with the preparation of specific classes of fluorine-containing aliphatic compounds, such as, for example, alcohols and alkanes.

Although the Bibliography at the end of each chapter is not complete, it is very extensive as well as valuable to the investigator faced with preparations and a need to know the art. Furthermore, the Tables at the end of the chapters which list physical properties of most of the known compounds of each class are invaluable.

The book is highly recommended for the person interested in the preparation and physical properties of aliphatic compounds. Little space is devoted to theory and the interpretation of unique properties of many fluorine-containing compounds. A total of 1333 preparative methods is an indication of the comprehensive nature and importance of the subject of fluorine-containing compounds. This area of knowledge continues to grow at an ever-increasing rate and I feel sure this book will be a stimulus to this growth.

DEPARTMENT OF CHEMISTRY
PURDUE UNIVERSITY
LAFAYETTE, INDIANA
EARL T. McBEE

Advances in Catalysis and Related Subjects. Volume X. Edited by D. D. ELEY, Nottingham, England; W. G. FRANKENBURG, Lancaster, Pennsylvania; and V. I. KOMAREWSKY, Chicago, Illinois. Associate Editor, PAUL B. WEISZ, Paulsboro, New Jersey. Academic Press, Inc., 111 Fifth Avenue, New York 3, N. Y. 1958. xvi + 326 pp. 15.5 × 23.5 cm. Price, \$11.00.

Even after the lamented death of two members of the original editorial staff who organized the compilation of *Advances in Catalysis*, the tenth volume shows that the original aims are still being faithfully followed, namely, to integrate and to report upon catalytic knowledge from all lands and from all disciplines. The popularity and usefulness of this series emphasize the wisdom of those aims. This new volume appropriately contains a short biography of the late editor, Walter G. Frankenburg, by R. Brill and F. F. Nord, and of the other late editor, Vasilii Ilyich Komarevsky, by Charles Riesz.

The seven chapters of the volume are written by outstanding leaders and contributors in the areas of their contributions: 1. "The Infrared Spectra of Adsorbed Molecules," by R. P. Eischens and W. A. Pliskin, 53 pp., contains a timely description of the recently introduced and rapidly developing techniques for determining the spectra of adsorbate molecules including ethylene, ethane and acetylene on nickel; carbon monoxide on palladium, platinum, iron, copper, and rhodium; and ammonia on silica alumina and γ -alumina. 2. "The Influence of Crystal Face in Catalysis," by Allan T. Gwathmey and Robert E. Cunningham, 38 pp., reviews the experimental work on the relation of crystal habit to catalytic activity. Three major types of reactions are represented by (a) oxidation of copper, (b) deposition of carbon from carbon monoxide on iron, cobalt and nickel, and (c) the reaction of hydrogen and ethylene on nickel. Eleven excellent halftones illustrate this chapter. 3. "The Nature of Active Centers and the Kinetics of Catalytic Dehydrogenation," by A. A. Balandin, 34 pp., is a very welcome English summary of the status of Balandin's famous "multiplet" theory in his own words. Balandin has, in the past, been associated with the strictly geometric interpretation of catalysis. The present treatment, however, also considers the effect of the nature of the bond. A four-page table presents a unified treatment of reaction parameters for some seventy-five catalytic reactions. 4. "The Structure of the Active Surface of Cholinesterases and the Mechanism of Their Catalytic Action in Ester Hydrolysis," by F. Bergmann, 34 pp., is an evaluation of the experimental and theoretical studies of cholinesterases, and the postulation from this analysis of a preliminary model of their structure and the manner of their action. 5. "Commercial Alkylation of Paraffins and Aromatics," by Edwin K. Jones, 30 pp., summarizes modern industrial practice in alkylation. Feedstocks, types of catalysts, process variables, commercial alkylates, and various alkylation processes are treated in adequate detail. 6. "The Reactivity of Oxide Surfaces," by E. R. S. Winter, 45 pp., reviews the experimental evidence showing how lattice oxygen itself takes part in the chemisorption step and catalytic reactions involving oxygen-containing gases, such as O_2 , CO, CO_2 and N_2O . The catalysts discussed are oxides of zinc, copper, iron, nickel, chromium, manganese, lithium, silver and tungsten. 7. "The Structure and Activity of Metal-on-Silica Catalysts," by G. C. A. Schuit and L. L. van Reijen, 75 pp., summarizes the status of our knowledge of the fundamental physical properties of the nickel, platinum, palladium, copper, iron and ruthenium in metal-silica catalysts obtained by mixture, co-precipitation and impregnation. Physical characterization is by means of chemisorption, electrical conductivity, magnetic properties and crystalline phase analysis.

The seven pages of author and subject indexes are a little scant if the reader wishes to use this volume as a reference book. On the other hand, the generous bibliographies accompanying most of the chapters are a distinct asset.

BUREAU OF MINES, REGION V
DIVISION OF SOLID FUELS TECHNOLOGY
BRANCH OF COAL-TO-OIL RESEARCH
PITTSBURGH, PENNA.
L. J. E. HOFER

The Chemical Kinetics of Enzyme Action. By KEITH J. LAIDLER, Professor of Chemistry, The University of Ottawa. Oxford University Press, 417 Fifth Avenue, New York 16, N. Y. 1958. vi + 419 pp. 16.5 × 24 cm. Price, \$9.60.

Professor Laidler has prepared this book with the idea that it might be helpful to collect together some of the main results and concepts that have been developed in the more physical chemical studies of enzymes. Considerable emphasis is placed on general principles and less on the details of individual enzyme systems. The treatment of each subject starts at an elementary level suitable for students.

The first part of the book is concerned with the more fundamental aspects of enzyme kinetics and includes chapters on General Kinetic Principles, Rate Laws in Enzyme Kinetics, The Time Course of Enzyme Reactions and The Influence of Hydrogen Ion Concentration. In the last part of the book various chapters deal with individual enzyme systems (proteolytic enzymes, other hydrolytic enzymes, oxidative enzymes, catalase and peroxidase), but there is

little discussion of the important transferring enzymes. Finally there is a chapter on the denaturation of proteins. In the Appendix there are some brief notes on some articles published in 1956-1957 which appeared too late to be included in the main body of the book. Dr. Laidler's book contains a great deal of useful information, particularly along the lines of his own research.

In discussing the mechanisms of enzymic reactions which go essentially to completion the assumption is made that the last step is irreversible. Actually this is a sufficient but not a necessary condition and leads to the common misconception that the concentration of the enzyme-substrate complex rises to a maximum and then falls to zero at infinite time. Even for reactions that go essentially to completion the concentration of an enzyme-substrate intermediate may rise continuously to its maximum value at equilibrium. On p. 129 Prof. Laidler seems to be making the mistake of reasoning about rates merely from knowledge of equilibrium constants. In various places in the book it would be desirable to specify buffer compositions and ionic strengths since the rates of enzymatic reactions in general depend upon these variables. It is regrettable that although many cyclic mechanisms are presented, the principle of detailed balancing is never discussed.

The book is of excellent appearance, as is characteristic of Oxford University Press, and there are author and subject indexes.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN

ROBERT A. ALBERTY

Unit Processes in Organic Synthesis. Fifth Edition. P. H. GROGGINS, Editor-in-Chief, Chemical Engineer, Technical Advisor, Food Machinery and Chemical Corporation. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y. 1958. x + 1070 pp. 17 X 23.5 cm. Price, \$17.50.

The fifth edition of this standard unit process text is a decided improvement over the previous edition in many ways. During the past 25 years since the issue of the first edition, the synthetic organic chemical industry has grown at a most rapid rate. It is little wonder that it has required five editions of this book at the rate of one each five years in order to keep up with the advances in this industry. Groggins' text has become "The Bible" in the unit process segment of chemical engineering and has been widely acclaimed by both the process engineers of industry and the organic technologists in the academic institutions. This newest edition represents virtually a complete rewriting of the text with the inclusion of many new co-authors, revisions

of some of the previous chapter materials and the inclusion of three new chapters. Some of the older material including two of the previous chapters have been omitted. As a textbook it is outstanding in its field, being highly suitable for both chemists and chemical engineers, who possess a sound background in organic chemistry, physical chemistry and mathematics. For the training of industrial organic chemists and the process type of chemical engineer, this is one of the better textbooks for courses in organic technology. For the process engineer in industry, this also serves as a handy reference book to bring him up to date with some of the modern practices in the industrial organic field.

The inclusion of three new chapters at the beginning of this edition is to be commended, for they serve to introduce applied thermodynamics, chemical kinetics and process kinetics as a valuable part of process engineering. More of this type of treatment is needed in the discussion of the individual unit processes for a more scientific approach to the subject. Some of the chapters lack continuity and correlation, perhaps due to lack of sufficient coordination between the co-authors. Also too much emphasis has been placed upon process details obtained through the patent literature, which do not in all cases represent modern accepted practice. In other instances, process details from the scientific military reports of World War II based upon the German chemical industry of more than a decade ago have been presented, which are quite different from that of the American industry. It is of course difficult to obtain up-to-date information of the practices of the American chemical industry, which are highly confidential. To substitute the older European practice for want of something better is, however, somewhat misleading.

The prime aim of this newest edition is to present most of the recent advances in organic technology under the various unit processes. The classical unit process concept is employed in presenting the material, starting first with a survey type of introduction, then presenting the basic theoretical considerations of the chemistry of the unit process, including the thermodynamic, kinetic and engineering factors. This is followed by a description of the design and construction of the process equipment and, lastly, many examples of industrial processes as illustrative of the application of the unit process are presented. There is a great deal of new illustrative material in this edition, which gives the reader a more complete understanding of the subject material as well as a practical viewpoint. This book is definitely a must for the industrial process engineer as well as the organic technology student.

DEPARTMENT OF CHEMICAL ENGINEERING
COLUMBIA UNIVERSITY
NEW YORK 27, N. Y.

JAMES M. CHURCH