

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.

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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.

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