

BOOK REVIEWS

Introduction to Chemical Process Technology. P. J. VAN DEN BERG AND W. A. DE JONG. Delft University Press—D. Reidel Publishing Company, 1980. ix + 309 pp. \$26.00

This volume presents a timely discussion of modern chemical and petroleum processing technology, primarily in qualitative terms. It is an ambitious task to do so in the present day, given the intimate connection between economically attractive process technology and raw material sources. However, the authors have attempted, successfully in large measure, to indicate the relations between various processing techniques and associated feedstocks which provide more than superficial insight as to what future trends may be.

The book begins with a fascinating introduction to the history of chemical technology—I wish they had developed this at greater length—and then proceeds with some general observations concerning the structure of process systems and raw material-product distributions. Then we are treated to a tour of selected process technology beginning, appropriately enough, with the ammonia synthesis. Subsequent topics include CO₂ and H₂S removal, inorganic acid manufacture, NaCl-based processing, selective oxidation, important polymerization process, and petroleum refining. Despite the diversity of topics, in each case the approach of relating process and product alternatives to different raw materials provides a certain uniformity to the book, and as the authors state, also provides “. . . a feeling for process development strategy.” Although the bulk of the processes discussed are catalytic, the emphasis is not generally on the catalysis involved but is on the process as an integrated whole. Hence the book probably has more primary value for the practitioner of industrial process development rather than basic research. This should be no surprise, since the title is a precise one.

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Chemistry and Chemical Engineering of Catalytic Processes. Edited by ROEL PRINS AND GEORGE C. A. SCHUIT. Sijthoff and Noordhoff International Publishers bv, 1980. 685 pp., \$75.00.

This book represents a collection of lectures pre-

sented in a NATO Advanced Study Institute held during August 1979 in Noordwijkerhout, The Netherlands. The Institute was planned for participants with at least a master degree in chemistry or chemical engineering. Readers who are less familiar with these disciplines would therefore find the first three chapters of the book helpful. These three well-written introductory chapters cover the fundamental principles of chemical kinetics (with an emphasis on gas-solid systems), mass transfer, and fixed bed catalytic reactors.

The book is then divided into sections covering five important areas of catalytic research: (1) catalytic cracking, (2) catalytic reforming, (3) homogeneous catalysis, (4) partial oxidation, and (5) coal conversion. Within each section the chemistry of interest is first discussed, followed by the structure and property of the catalytic material. Finally the engineering aspects including process technology and reactor design are presented. The objective of such an integrated approach is to highlight the relationship between catalytic chemistry and chemical engineering, thus providing a sound perspective on the individual processes. This objective turns out to be better met in some sections than in others due primarily to the disparity in coverage. There are, for example, nine chapters on the reforming of hydrocarbons on metals and alloys and only three chapters on homogeneous catalysis.

In general the content presented in each chapter is comprehensive and readable. But as to be expected from a book written by multiple authors, there is a noticeable difference in the level of discussion, the thoroughness of presentation, and the extensiveness of references in various chapters. Consequently some loss of coherence is inevitable. It is unfortunate that general introductions to each section, which were presented in the Institute to alleviate this problem, are not included in the present volume. On the whole it appears that most chapters in the book were written more as an introduction to the subject for the novice rather than an extensive up-to-date survey for the expert. In fact half of the chapters contain fifteen references or less.

The role of surface science in catalysis, in particular the experimental aspects, receives relatively little attention in the book. The chapter on surface electron spectroscopy focuses primarily on single crystal results. The application of modern characterization techniques to conventional catalytic materials is sparsely discussed. The few brief examples scattered throughout the book do not seem to be commensurate with the recent extensive research effort in the area.

The book is also marred by quite a few typographi-