

4. Welch, L. M., L. J. Croce, and H. F. Christmann, *Hydrocarbon Processing*, p. 131 (November, 1978).
5. Boudart, M., *Kinetics of Chemical Processes*, Prentice Hall, p. 211 (1968).
6. Melander, L. C., *Isotope Effects on Reaction Rates*, Ronald Press, New York (1960).
7. Massoth, F. E., and D. A. Scarpiella, *J. Catalysis* 21, 29 (1971).
8. Keulks, G. W., L. D. Krenzke, and T. N. Nottermann, *Advances in Catalysis* 27 (1978).
9. Haber, J., *Int. Chem. Eng.* 15, 21 (1975).
10. Cares, W. R., and J. W. Hightower, *J. Catalysis* 23, 193 (1971).
11. Columbian Carbon Company, 1971.
12. Luss, D., *Chem. Eng. Journal* 1, 311 (1970).
13. White, M. G., "The Oxidative Dehydrogenation Dimerization of Olefins over Metal Oxides," Ph.D. Thesis, Rice University, 1977.
14. White, M. G., and J. W. Hightower, *AIChE Journal* 27, 545 (1981).
15. Chickering, D. H., "Oxidative Dehydrogenation of n-Butane over Mixed Metal Oxide Catalysts," Ph.D. Thesis, Rice University, 1981.
16. Van Kleeck, D. A., "Oxidative Dehydrogenation of Butenes over Manganese Ferrite," Ph.D. Thesis, Rice University, 1981.

ChE book reviews

PLANT DESIGN AND ECONOMICS FOR CHEMICAL ENGINEERS, 3RD EDITION

By Max S. Peters, Klaus D. Timmerhaus
McGraw-Hill Book Company, NY

Reviewed by Oran L. Culberson
University of Tennessee

This book in its third edition continues to be among those classics which should be in the personal library of every chemical engineer. It is, however, basically unchanged from the second edition and may not merit acquisition by those who own the second edition.

The following chapters in the new edition contain very much the same information that was in second edition chapters: (1) Introduction, (2) Process Design Development, (4) Cost and Asset Accounting, (5) Cost Estimation, (6) Interest and Investment Costs, (7) Taxes and Insurance, (8) Depreciation, (9) Profitability, Alternative Investments and Replacements, (11) Materials and Fabrication Selection, (12) The Design Report, (13) Materials Transfer, Handling and Treating Equipment, (14) Heat Transfer Equipment and (16) Statistical Analysis in Design. There is now an appendix dealing with SI

units, but SI seldom appears anywhere else in the new edition. (This is not a significant fault in the opinion of this gray-haired reviewer.) Appendices for Auxiliary and Utility Cost Data, for Design Problems and for Tables of Physical Properties and Constants are presented much as in the prior edition.

The erstwhile appendices on Linear Programming and Dynamic Programming have been moved into Chapter 10, Optimum Design and Design Strategy. This was perhaps a mistake. These two optimization algorithms have little application in design. Geometric programming would have been a more appropriate offering. It is also unfortunate that the material on linear programming does not note that modern computer programs do not use the Simplex algorithm described; this omission will be confusing and aggravating to the reader who wants to use library programs on computers. A better use of the space would have resulted from exposition on the Critical Path Method and for the Project Evaluation and Review Technique which are valuable for the scheduling and control of projects. Chapter 10 has been expanded also to explain the concept of cash flow and to show how the effects of inflation might be covered in economic analysis.

Chapter 3 on General Design Considerations has been more than doubled to include information on design requirements to protect against thermal, air, liquid and solid waste pollution. Chapter 15, formerly devoted exclusively to Mass Transfer Equipment, now treats Reactor Equipment also. This material is from an appendix of the second edition, with some augmentation.

A great strength of this book has always been the voluminous bibliography at the end of each chapter. These literature references have been updated and are very valuable to anyone wanting to delve into a topic beyond the limited treatment which can be made in the book. The new edition is still replete with equipment costs, now updated to January 1, 1979. A table of the costs of chemicals appears in the new edition which unfortunately contains neither a date nor a warning to the neophyte that these costs can change rapidly.

Another quite useful feature of this book is the extensive sets of problems for each chapter, but the problems have not been changed in the two editions. This reviewer overheard a professor bemoaning this fact at the AIChE meeting in Chicago. □