

BOOKS

Elementary Principles of Chemical Processes by Richard M. Felder and Ronald W. Rousseau, John Wiley and Sons (1978), 571 pp. (\$21.95).

The title would indicate this is merely a routine addition to the long line of stoichiometry texts written for beginning chemical engineering students. *Not so.* It is a timely, well reasoned, carefully structured book authored by two chemical engineers who have demonstrated obvious concern for teaching non-reactive and reactive material and energy balances in a manner to both motivate and educate the reader. In the opinion of this reviewer, the style and level of presentation of the content is excellent, and the subject matter represents the ideal body of knowledge which should be imparted to students in the first year of a chemical engineering curriculum.

The six page initial chapter entitled "What Chemical Engineers Do for a Living" is as informative and appetizing as one could hope to find to command the attention of students and generate interest in both the chemical engineering profession and the contents of the book itself. The next three (relatively brief) chapters which deal with systems and conversion of units, processes and process variables, and process data representation and analysis are discretionary dependent upon the prior knowledge of the reader. The authors then proceed to cover the fundamentals of material balances; and when one has mastered the techniques of performing material balances for

multiple unit reactive processes including recycle there ensue two excellent chapters on single-phase and multiphase systems. This is then followed by a thorough treatment of energy balance concepts and combined material-energy balance process analyses. A final chapter on unsteady material and energy balances is a superb introduction to the study of transient phenomena.

However, the coup de maître of the book is the presentation of three case study problems: Production of Formaldehyde, SO₂ Removal from Power Plant Stack Gases, and the Kraft Pulp- ing Process. Here the student is given the opportunity to translate word descriptions to process diagrams, utilize the text material to perform detailed material and energy balances, and extend himself to answer questions of practical engineering significance related to the projects.

In noting other features of the book, a reasonable balance has been maintained in the use of SI, cgs, and American engineering system units. The text is readable and at times almost conversational with occasional sprinkles of humor. Illustrative examples are numerous and extremely well presented. Within chapters there are short "test yourself" questions and exercises to keep the reader focused on basic concepts. The nearly 500 end-of-chapter exercises thoroughly cover the important areas of chemical production, separation processes, energy generation, environmental and safety problems, etc.

Also included are exercises specifically designated to be solved by numerical-computer techniques—a bonus for those acquiring or having such skills. Tables in the Appendices provide most of the information required to solve the text problems; and the Appendices further contain short presentations of numerical integration techniques, least squares analysis, and solution methods for non-linear algebraic equations.

There is one minor point of criticism; namely the authors' statement that most of the text can be covered in a one semester course. This seems a bit ambitious, since a one year course would appear more appropriate for the average student. Nevertheless, Professors Felder and Rousseau are to be highly commended for an important and excellently written contribution to the chemical engineering and teaching profession.

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Industrial Organic Chemistry, K. Weissermel and H. J. Arpe, Verlag Chemie (1978), 404 pages, \$38.00.

The authors have done an excellent job of reviewing the literature on industrial organic chemistry. The raw materials used, operating conditions (temperature and pressure), catalysts, yields and in some cases the materials of construction are listed. The names of the reaction and companies which