

ChE class and home problems

In the Spring 1980 issue of CEE, Professor Robert L. Kabel presented the "Prairie Dog Problem" and our student readers were encouraged to submit their solution to him at the ChE Department, Pennsylvania State University, University Park, PA 16802, by June 15th, 1980. This deadline for entries has now been extended to September 5th, 1980, and Professor Kabel's solution to the problem, will be published in the Fall 1980 issue of CEE. A complimentary subscription to CEE will be awarded to the best solution submitted in both graduate and undergraduate categories (please designate your student status on your entry.)

BOOK REVIEW: Chemical Processes

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of industrial processes. The book contains almost 600 problems, including many computer problems, at the end of chapters. In general, the text content is similar to Himmelblau's.

The strength of this text is in the authors' use of clear, concise language and carefully chosen examples to convey concepts to the reader. This text is obviously written with students in mind. To aid in the students' learning, important points are italicized and "Test Yourself" questions are scattered throughout the reading material. Answers to all "Test Yourself" questions plus some homework problems are given in the Appendix. In Parts 1 and 2, SI units seem to be used in about one-half of the examples and homework problems. However, in Part 3 the emphasis on SI units increases. Conversion tables on the inside cover make conversion factors readily available. The physical property tables in the appendix are quite complete although in some problems the authors also force the student to become familiar with Perry's Handbook as an information resource. However, the psychrometric charts are a disappointment. They have been reduced to 4.5 x 6" charts and are practically impossible to read. Most instructors will want to supply supplemental psychrometric charts.

Some instructors will also disapprove of the authors' decision to adopt the convention of positive work as that work done on a system by the surroundings. Thus, in the First Law the heat and work side of the energy equation becomes $Q + W$. While this convention has been adopted as an international standard, most current texts still use the opposite sign convention.

Nevertheless, this text appears to have many

more positives than negatives. The case studies offer the opportunity of assigning term-long, comprehensive problems to help tie course concepts together. Alternatively, the instructor can choose to emphasize computer aspects and assign programming problems. The authors have gone to considerable lengths to help instructors use this text. The problem solution manual is almost error-free and includes four suggested course outlines for either a semester course or a two quarter sequence. Complete solutions to the case studies are supplied. The text is flexible enough to offer an instructor the opportunity to design an introductory stoichiometry course to suit that instructor's own objectives.

The bottom line is whether this text is accepted by students. In our initial experience we found the students' acceptance to be exceptional. Quite simply, the students find the text readable and easy to learn from. They find the problems understandable and worthwhile.

In summary, this text merits serious consideration by any instructor who teaches an introductory chemical engineering course. □

AIR POLLUTION—3RD EDITION VOL. IV— "ENGINEERING CONTROL OF AIR POLLUTION"

Edited by Arthur C. Stern
Academic Press, Inc., N.Y.
Reviewed by William Licht
University of Cincinnati

In 1970 Professor Arthur C. Stern was presented the Richard Beatty Mellon Award of the Air Pollution Control Association because (in part) he was "the man who wrote *the book!*" The reference was to the monumental "Air Pollution" already in its second edition (1968) of three

volumes. Professor Stern conceived the grand detailed plan, wrote some sections himself, edited the many contributions written by others, and was the guiding spirit required to bring it to completion.

Now we have the third edition, expanded to five volumes of nearly a thousand pages each, but again organized and edited by Stern. The work attempts to deal with every aspect of air pollution and its control. It must run hard to attempt to keep up with the flood of technical literature of the last decade.

Volume III of the second edition dealt with: Sources of Air Pollution, Control Methods and Equipment, and Air Pollution Control (legislation and administration). Volume IV, under review here, is the corresponding part of the new edition with regard to the first two areas, but the subject of Air Quality Management has been moved to a separate Volume V. Each of the twenty one chapters is written by different authors, specialists in the topic of the chapter.

The first third of Volume IV deals with general control concepts and the principles of control devices as applied to stationary sources for the removal of particulate matter and gases. General principles of operation, description of equipment, and principles of selection and evaluation are given for mechanical collectors, filters, electrostatic precipitators, scrubbers (all kinds), mist eliminators, adsorption beds, and combustion processes.

The remainder of the Volume is devoted to specific categories of sources and their control: Fuels and combustion products of all kinds (including motor vehicles), agricultural and forest products, mineral and petroleum processing, the chemical industries, and metallurgical operations. Flow charts and process descriptions are given to indicate the source and amount of emissions and typical present methods of control.

The book is excellent for a general introduction or survey of any of the topics presented. For the in-depth knowledge needed in design work, more specialized references must be consulted, especially in regard to the theoretical aspects of the control equipment performance. The volume is handsomely printed and well-documented with original references. It is an inevitable risk in a work of this scope that the various chapters may be uneven in quality of writing and in being up to date. Professor Stern has succeeded in minimizing (although not eliminating) this risk. □

BIOPHYSICAL CHEMISTRY—PRINCIPLES, TECHNIQUES, AND APPLICATIONS

By Alan G. Marshall

(University of British Columbia)

Wiley & Sons, New York, 1978, 812 pages.

Reviewed by D. O. Cooney

Clarkson College

This book is a meticulous, thorough, and lucid exposition of biophysical chemistry. The clarity of presentation, the choice of examples and illustrations, and its precise (yet not stifling) attention to detail are all very strong features of this text. Moreover, along the way the scientific bases and applications of nearly every important modern type of biophysical measurement techniques are clearly presented (including affinity chromatography, laser light scattering, ultrasonic imaging, ion-selective electrodes, and many more). In addition, the same clear treatment is given to traditional subjects, such as the thermodynamics and chemistry of biological systems (electrochemical potentials, semipermeable membranes, macromolecular solubility, enzyme kinetics, pharmacokinetics, etc.). Techniques involving electrophoresis, sedimentation, polarography, radioactive tracers, and a wide array of spectroscopic and scattering phenomena (NMR; x-ray scattering; neutron diffraction; visible, UV, and IR spectroscopy; fluorescence, etc.) are explained, and interesting examples of their uses are presented.

The most novel and valuable feature of the book, however, is its arrangement into six major sections, in each of which processes or phenomena having the same types of mathematical bases are grouped. For example, one section treats all kinds of growth and decay processes, and another treats all processes based on probability (e.g., random walk processes like diffusion, radioactive counting methods). The advantage of this approach is that, once a basic type of mathematical model is presented, subsequent applications of the model to other processes having the same kind of physical basis consists simply of changing the names of the mathematical variables.

How useful this book might be to academic chemical engineers is another matter; however, for those having a biomedical or biochemical interest I would recommend this as a volume that might be valuable as a source of many ideas that could be injected here or there into a bio-related course. □