

once these skills have been established through means such as closed-ended problems.

## REFERENCES

1. Fogler, H.S., *Elements of Chemical Reaction Engineering*, Prentice-Hall, Englewood Cliffs, NJ (1986)
2. Felder, R.M., and R.W. Rousseau, *Elementary Principles of Chemical Processes*, second edition, Wiley, New York, NY (1986)
3. Blicq, R.S., *Technically - Write!*, third edition, Prentice-Hall, Scarborough, Ontario (1987)
4. Luyben, W.L., and L.A. Wenzel, *Chemical Process Analysis: Mass and Energy Balances*, Prentice-Hall, Englewood Cliffs, NJ (1988)
5. Furter, W.F., M.J. Pegg, and P.R. Amyotte, "A Practical Application of Mass Balances," *Chem. Eng. Ed.*, **23**, 163 (1989)
6. Felder, R.M., "Stoichiometry Without Tears," *Chem. Eng. Ed.*, **24**, 188 (1990) □

## ChE book review

### ELEMENTARY GENERAL THERMODYNAMICS

by M.V. Sussman

Reprint Edition with Corrections; Robert E. Krieger Publishing Co., PO Box 9542, Malabar, FL 32902; 478 pages, \$52.50 (1989)

Reviewed by

Amyr Teja

Georgia Institute of Technology

This is a reprint edition of the book first published in 1972 by Addison-Wesley Publishing Co. The new printing corrects a large number of typos in the original edition and provides more exposure to SI units. There are also a number of minor additions to the text, such as a brief mention of the Design Institute of Physical Properties Research (DIPPR) publications and even references to estimation methods for thermodynamic properties. In all other respects, however, this version of the book is identical to the original.

The book is designed as a broad introduction to thermodynamics and its many applications to engineering and science. Thus there are the usual chapters on the first and second laws (Chapters 2 and 3), power and refrigeration cycles (Chapter 4), relationships among thermodynamic properties (Chapter 6), equations of state (Chapter 7), fugacity and activity (Chapter 8), thermodynamics of mixing and composition change (Chapter 9), and chemical equilibrium (Chapter 10).

In addition to the above, however, there are also introductory chapters on statistical thermodynamics (Chapter 5) and irreversible thermodynamics (Chapter 11). Moreover, there are sections on nuclear energy, electrochemical processes, and fuel cells

which are not generally found in introductory textbooks of thermodynamics.

Not unexpectedly, the breadth of coverage comes at the expense of depth. Thus, the discussion on cubic equations of state stops at the van der Waals equation, with a brief mention of the Redlich-Kwong equation but no mention of the other variants widely used in chemical engineering process calculations. Also, none of the modern analytic versions of the corresponding states principle are described. More importantly for chemical engineers, only the van Laar equation is discussed as a solution to the Gibbs-Duhem equation, and none of the recent activity coefficient models are mentioned. The section on fluid phase equilibria is therefore all too brief. Finally, statistical thermodynamics is only discussed from the point of view of providing a molecular explanation of entropy, and the reader is not given any indication that it could lead to, for example, equations of state for real fluids.

Nevertheless, the book achieves reasonable depth in many cases and offers a possible alternative to the texts more specifically designed for chemical engineers. It is particularly suited to students who are introduced to thermodynamics in their sophomore or even their freshman years. It appears to be suitable as a self-teaching text because it makes liberal use of worked examples and certainly provides a broader view of the applications of thermodynamics. Perhaps it could serve as a supplementary text in undergraduate chemical engineering thermodynamics courses. Students will certainly find reading it worthwhile. □

## ChE books received

*Understanding Process Integration II*, by R. Smith; Hemisphere Publishing Corp., 79 Madison Ave., New York, NY 10016-7892; 360 pages, \$79.50 (1988)

*Thermo- and Laser Anemometry*, by Polyakov; Hemisphere Publishing Corp., 79 Madison Ave., New York, NY 10016-7892; 173 pages, \$40.00 (1988)

*Basic Concepts of Chemistry* (Third Edition), by Leo J. Malone; John Wiley and Sons, 1 Wiley Drive, Somerset, NJ 08875-1272; 682 pages, \$42.50 (1989)

*Chemical Information: A Practical Guide to Utilization*, 2nd Edition, by Yecheskel Wolman; John Wiley & Sons, Inc., 1 Wiley Drive, Somerset, NJ 08875-1271; 291 pages, \$44.95 (1988)

*Chemistry: Experiment and Theory*, Second Edition, by Bernice G. Segal; John Wiley & Sons, Inc., 1 Wiley Drive, Somerset, NJ 08875-1272; 1008 pages, \$49.22 (1989)

*Engineering Applications Software Development Using FORTRAN 77*, by G. A. Moses; John Wiley & Sons, 1 Wiley Drive, Somerset, NJ 08875-1272; 320 pages, \$39.95 (1988)