(*Continued from page 142*)

INFORMATION RETRIEVAL

Key Words: A., Partial Enthalpy-8, Gas Mixture-8, Equation of State-10, Computer Program-10, Graphical Calculations-10, Pressure-6 Composition-6. B. Hydrocarbons-8, Redlich-Kwong PVTC Data-10, Generalized-10.

Abstract: Partial enthalpy correlations for components of gas mixtures have been developed from the Redlich-Kwong equation of state. Generalized graphical and analytical forms are presented for the correlations, which give partial enthalpy differences (isothermal effects of pressure and composition). Comparisons with values derived from experimental PVTC data on hydrocarbon binaries are included.

Reference: Edmister, W. C., R. E. Thompson, and Lyman Yarborough, **A.I.Ch.E. Journal, 9,** No. 1, p. 116 (January, 1963).

Key Words: Gas-Liquid Chromatography-8, Vapor-Liquid Equilibria-9, Vapor-Liquid-Solid Equilibria-9, Pressure, Temperature, Concentration-6, Paraffin Hydrocarbons-5, Vapor-Liquid Equilibria-2, High Pressure-6, Activity Coefficients-6.

Abstract: The technique of gas-liquid partition chromatography has been investigated as a means of studying the equilibrium of a solute between a gaseous and a liquid phase in multicomponent systems at high pressures and as a means of determining the gas-liquid-solid phase equilibrium line in a binary system.

Reference: Stalkup, Fred I., and Riki Kobayashi, **A.I.Ch.E. Journal, 9,** No. 1, p. 121 (January, 1963).

Key Words: Reactors-8, Beds-8, Packed- , Fixed- , Heat Transfer-9, Mass Transfer-9, Reactions-9, Transport-9, Size-6, Properties (Characteristics)-6, Diffusion-6, Pore Diffusion-6, Dispersion-6, Axial-6, Conversion-7, Yield-7, Numerical Integration-10, Models-10, Computers-10, IBM-650-10.

Abstract: A digital computer model of the adiabatic-fixed bed catalytic reactor is developed which includes axial dispersion of heat and mass, interparticle heat and mass transport, and intraparticle diffusion of reacting species.

Reference: Carberry, James J., and Martin M. Wendel, **A.I.Ch.E. Journal, 9,** No. 1, p. 129 (January, 1963).

pressure apparatus have indicated that in a given system the phenomenon increases in severity with increasing boiling flux in the nucleate boiling range, with increasing concentration of sodium phosphate, and with increasing boiling temperature. **Materials of Construction for the Dual Temperature Exchange Process for Producing Heavy Water,** Victor R. Thayer and W. B. DeLong. Petroleum industry experience with hydrogen sulfide was made available to the authors in support of the development program. This experience indicated that in addition to ordinary surface corrosion of constructional stills by hydrogen sulfide-water there were the problems of blistering and cracking to be dealt with. **Pumps for Liquid Metals,** Arthur F. Erwin. Descriptions of the major types of liquid metal pumps that are gaining acceptance in the nuclear power field together with the major advantages and disadvantages expected for each type are presented. **Development of Design Concepts for a Hanford Radiocesium Packaging Facility,** L. C. Amos, R. J. Sloat, and R. W. Wirta. Industrial applications of radioisotopes are steadily increasing in scope and magnitude. It is expected that within the next decade markets will develop for megacurie quantities of certain long-lived isotopes. **Recovery of Uranium in the Manufacture of Wet-Process Phosphoric Acid,** E. W. Nadig and George Burnet. A uranium balance was completed across each of two recently constructed wet-process phosphoric acid plants of different design. Basic engineering design data were developed for recovery of the uranium from one of the plant acids through either solvent extraction or ion exchange.

ERRATUM

Equation (8) of the article "Countercurrent Heat or Mass Transfer Between a Turbulent and a Laminar Stream: 1. Flat Velocity Profiles and Short Contact Times" by E. N. Lightfoot, which appeared on page 417 of the July, 1962, issue of the *A.I.Ch.E. Journal,* should read $R = \sqrt{1 + 2\,\alpha/\beta}$.

BOOKS

Introduction to Statistical Thermodynamics, Terrell L. Hill, Adison-Wesley Publishing Company, Incorporated, Burlington, Massachusetts (1960). 508 pages. $9.75.

This book is intended primarily as an introductory text for physical chemists and physicists. Notwithstanding, it should be of interest to graduate students in chemical engineering, not because of its treatment of the basic concepts of statistical mechanics, but because most of it is devoted to applications of interest to the chemical engineer. Indeed, the title is misleading in that the presentation of basic principles is so condensed that another supplementary text giving more details would probably be required.

The author has divided the material into four parts, of which the first deals with the basic principles of quantum statistical mechanics. As is common nowadays, classical statistical mechanics is treated as a limiting case of the quantum-mechanical formulation. Consequently, some familiarity with elementary quantum mechanics is assumed. Parts two and three are concerned with applications to systems of independent molecules and of interacting molecules respectively. A single chapter on quantum statistics makes up the last part. Five of the seven appendices constitute additional notes on the mathematical techniques used and of the remaining two; one is a table of physical constants and the other a few comments on the Lennard-Jones potential.

Although the treatment of each topic is only introductory, it is nevertheless useful and meaningful. Further, a large number of topics is covered, ranging from the virial equation of state, through lattice statistics to theories of the liquid state. The only topic which is included and which is not strictly within the domain of equilibrium statistical mechanics is the (pseudo equilibrium) absolute theory of reaction rate.

Generally, the text is well prepared with the problems at the end of each chapter forming a useful and important part of the book.

As an introduction to the applications of equilibrium statistical mechanics, this book is highly recommended.

COLIN MCGREAVY
YALE UNIVERSITY