(*Continued from page 412*)

Bulk flow in diffusion coefficient studies, Board, W. J., and S. C. Spalding, Jr., **A.I.Ch.E. Journal, 12,** No. 2, p. 349 (March, 1966).

Key Words: A. Mass Transfer-8, 4, 9, Diffusion-10, 8, Diffusivity-8, 2, Acetone-1, 9, N,N-dimethyl acetamide-1, 9, Water-1, 9, Diaphragm-9, Acrylonitrile-9, Vinylacetate-9, Pressure Gradient-6, Rate-7, Diffusion Cell-9, 10.

Abstract: It is argued that the manner in which diaphragm cells (used for the determination of diffusivity) are often operated can give rise to an unmeasured amount of material transport originating from a pressure gradient instead of a diffusion gradient. A suggested method is the use of more tortuous diaphragms and an infinite sink on one side, by which the measured quantity is an approximation to purely diffusional gradient transport. Diffusivities computed by this method are compared with diffusivities obtained by conventional methods.

Vapor-liquid phase behavior of the helium-methane system, Sinor, J. E., D. L. Schindler, and Fred Kurata, **A.I.Ch.E. Journal, 12,** No. 2, p. 353 (March, 1966).

Key Words: A. Measuring-8, 4, Determining-8, 4, Solubility-9, 8, 7, Helium-9, Methane-5, Gaseous-0, Liquified-0, Equilibrium-9, Temperature-6, Pressure-6, Apparatus-9, 10, Cell-9, 10, Experimenting-10. B. Description-8, Diagram-8, Behavior-9, 8, Composition-9, 8, Equilibrium-9, System-9, Two-Phase-0, Vapor-Liquid-0, Helium-9, Methane-9.

Abstract: Extensive experimental vapor-liquid equilibria data for the helium-methane system are presented. A static sampling technique was used to obtain vapor and liquid compositions for six temperatures between —180° and —85°C. and pressures up to 2,000 lb./sq.in.abs. Experimental data are presented in tabular form and in various phase composition diagrams. The data are represented by means of the Krichevsky-Kazarnovsky equation and it is argued that extrapolations to higher pressures should be feasible.

Viscosity profiles, discharge rates, pressures, and torques for a rheologically complex fluid in a helical flow, Savins, J. G., and G. C. Wallick, **A.I.Ch.E. Journal, 12,** No. 2, p. 357 (March, 1966).

Key Words: A. Fluid Flow-8, 9, 4, Helical Flow-8, 6, 4, Couette Flow-8, Poiseuille Flow-8, Annular Flow-8, Fluids-9, Non-Newtonian-0, Cylinders-9, Rotating Cylinders-9, Coaxial-0, Viscosity Profiles-8, 7, 1, Torque-7, 2, Discharge-7, 9, 2, Pressure-7, 2, Axial-0, Rate-7, 2, Calculating-8, Angular Velocity-1. B. Coupling-8, Pressure-9, Discharge-9, Axial-0, Rate-9, Angular Velocity-9, Helical Flow-10, 9, Fluids-9, Non-Newtonian-0.

Abstract: Quantitative predictions are presented to show how the axial discharge rate and pressure gradient and angular velocity and torque become coupled when a fluid exhibiting a shear-dependent viscosity behavior is subjected to a helical flow field. The numerical scheme developed here is completely general and applicable to a wide choice of constitutive equations. The coupling effect is illustrated for different relative speeds of the cylinders, axial flow rates, axial pressure gradients, and ratios of cylinder diameters. The effect of helical flow on axial discharge rate is also illustrated.

Application of the Gibbs-Konovalow equations to binary phase equilibria, Franzen, H. F., and B. C. Gerstein, **A.I.Ch.E. Journal, 12,** No. 2, p. 364 (March, 1966).

Key Words: A. Description-8, 4, Binary Phase Equilibria-9, Phase Diagrams-9, 2, High Order Transitions-9, Melting Phenomena-9, Congruent Melting-9, Peritectic Decomposition-9, Gibbs-Konovalow Equations-10, 2, 8, Derivation-8, 4.

Abstract: The Gibbs-Konovalow relations are shown to provide a unified approach to the description of binary two-phase equilibria. The relations are applied to a consideration of high order transitions and are shown to lead easily to well-known, but generally uncorrelated, behavior of slopes of lines separating two single-phase regions in binary systems. In particular, the conditions under which the slope of the temperature-composition line is zero, constant, or undefined in the neighborhood of congruent and peritectic processes are derived.

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High Pressure Chemistry, R. S. Bradley and D. C. Munro, Pergamon Press, New York (1965). vii plus 186 pages, $3.95.

This book surveys the field of high pressure research as it applies to chemistry, with a strong emphasis on applied chemistry. The theory presented is rather rudimentary, as is necessary in such a brief treatment of a broad subject. After a short introduction there is a chapter on techniques which is very uneven in its coverage. There is, for instance, no reference to *Modern Very High Pressure Techniques*, edited by R. S. Wentorf, which was published in 1962. Methods for physical measurement are poorly covered. There are five chapters which cover properties of gases, solids and liquids, phase changes, chemical reactions, mineral synthesis, and detonations and shock waves.

The chapters on chemical reactions and on syntheses are well done and will be useful in introducing chemical engineers to this area. The chapter on detonations and shock waves also provides a useful introduction to a field of increasing commercial significance. The chapter on properties of matter is less well done and provides few appropriate leads for a person new to this area.

On the whole, the authors have managed to compress considerable information into a brief space, and at a very reasonable price. The book should be valuable particularly to people interested in entering the area of chemical synthesis at high pressure.

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