(*Continued from page 430*)

INFORMATION RETRIEVAL*

Key Words: Heat Transfer-8, Mass Transfer-8, Rates-8, Transport-8, Fluid Flow-8, Turbulence-9, Fluids-9, Gases-9, Air-9, Evaporation-9, Octane-9, Hydrocarbons-9, Spheres-10, Balls-10, Porosity-, Physical Properties-, Properties (Characteristics)-, Numbers-10, Nusselt-.

Abstract: An investigation of macroscopic and local thermal and material transport from a silver and a porous sphere, each 1.0 in. in diameter, for various flow conditions is conducted. For the porous sphere the evaporation of **n**-octane into a turbulent air stream was studied. The results indicate that the macroscopic Nusselt number is substantially larger for combined transport than for thermal transport alone.

Reference: Venezian, Emilio, Manuel J. Crespo, and B. H. Sage, **A.I.Ch.E. Journal, 8,** No. 3, p. 383 (July, 1962).

Key Words: Absorption-8, Mass Transfer-8, Reactions-8, Rates-8, Flow-9, Fluid Flow-9, Laminar Flow-9, Turbulence-9, Columns (Process)-10, Disk-, Ammonia-1, Acetic Acid-1, Acids (Carboxylic)-1, Unsteady State-9, Liquid Phase-9, Reactions-9, Coefficients-9, Predicting-9, Estimating-9, Twot Film Theory-10, Unsteady State-10, Theory-10.

Abstract: Absorption accompanied by a rapid, second order, irreversible reaction has been studied in a "disc" column for both laminar and turbulent flow. The chemical system used involved the absorption of ammonia by acetic acid. Results confirm the predictions of the "two-film" and "unsteady state" theories for this class of two phase reactions.

Reference: Dhillonn, Sharanjit S., and R. H. Perry, **A.I.Ch.E. Journal, 8,** No. 3, p. 389 (July, 1962).

Key Words: Extraction-9, Separation-9, Mass Transfer-9, Concentrations-9, Thermodynamics-8, Equilibrium-8, Liquid Phase-8, Mixtures-8, Solutions (Mixtures)-8, Profiles-8, Ideal-, Activities-8, Gradients-8, Theories-10, Penetration-, Columns (Process)-10, Packed-, Extractors-10.

Abstract: Concentration profiles have been computed for an idealized extraction in a packed extraction column involving a three-component system. The results are presented for various mass transfer coefficient ratios. A modified activity gradient, derived for both molecular diffusion and penetration theory conditions, is used in place of the usual concentration driving potential. Explanations are offered for the calculated behavior of the raffinate and extract phases.

Reference: Hennico, Alphonse, and Theodore Vermeullen, **A.I.Ch.E. Journal, 8,** No. 3, p. 394 (July, 1962).

Key Words: Adsorption-8, Methane-1, Propane-1, **n**-Butane-1, **n**-Pentane-1, **n**-Hexane-1, Methanethiol-1, Ethanethiol-1, Propanethiol-1, Carbonyl Sulfide-1, Carbon Disulfide-1, Activated Carbon-10, Temperature-6, Pressure-6, Capacity-7, Correlation-8, Isotherm-9, Free Energy-10.

Abstract: Adsorption isotherms of methane, propane, **n**-butane, **n**-petane, **n**-hexane, methanethiol, ethanethiol, propanethiol, carbonyl sulfide, carbon disulfide, and hydrogen sulfide on activated carbon have been determined gravimetrically from —23° to 100°C. at pressures up to 1 atm. Correlation of the isotherms by a published method based on adsorption free energy considerations yielded two curves, one for the hydrocarbons, the other for the sulfur-containing compounds.

Reference: Grant, R. J., Milton Manes, and S. B. Smith, **A.I.Ch.E. Journal, 8,** No. 3, p. 403 (July, 1962).

Key Words: A. Disturbance-1, Perturbation1-, Step-Change-1, Transient Response-2, Rate-Change-6, Transient Response-8, Distillation-8, Column-8, Control-9, Analogue Computer-10.

Abstract: Experimental transient response data are presented for a five-tray, 2-ft. diameter, bubble-cap distillation column when a step increase in liquid rate or a step decrease in vapor rate to the column was made. The column was allowed to proceed from an original total reflux condition to a new, final, steady state condition during which time the changes in composition of the tray liquids were measured. The experimental results compare well with those predicted by perturbation types of equations solved on an analogue computer.

Reference: Baber, M. F., and J. A. Gerster, **A.I.Ch.E. Journal, 8,** No. 3, p. 407 (July, 1962).

overcoming these difficulties and in presenting a unified treatment of the subjects which should be understandable to the audience to which the book is addressed.

Among the strong points of this book are the illustrative examples which are included to show how the concepts are used and a large number of well-conceived problems at the end of each chapter. The space utilized for these materials sometimes leads to too-brief text material, particularly in making clear the physical situation which is under consideration.

The author's use of the symbol of partial differentiation in such equations as $\partial p = -\partial z$ (page 8) and $\phi = \int 2x\,\partial x$ (page 62) is an improper one which might confuse students. It would have been preferable to note first that the partial derivation involved can in fact be treated as ordinary derivatives for each particular case for reasons arising from the physical situation or from the nature of the mathematical operation being performed.

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Computer Program Abstracts

Readers of the *A.I.Ch.E. Journal* who are interested in programing for machine computation of chemical engineering problems will find in each issue of *Chemical Engineering Progress* abstracts of programs submitted by companies in the chemical process industries. Collected by the Machine Computation Committee of the A.I.Ch.E., these programs will be published as manuals where sufficient interest is indicated. The following abstracts have appeared this year:

CEP (May, 1962) p. 80

Solution of Ordinary Differential Equations (094)

Transient Two-Dimensional Temperature Distributions in Slabs, Cylinders, or Spheres with Complex Modes of Heat Exchange and Generation (093)

CEP (June, 1962) p. 80

Canonical Analysis (096)

Principal Component and Factor Analysis (097)