(Continued from page 142)

The effect of applied voltage on boiling heat transfer, Markels, Michael, Jr., and Robert L. Durfee, **A.I.Ch.E. Journal, 10,** No. 1, p. 106 (January, 1964).

Key Words: A. Boiling-2, 7, 8, Heat Transfer-2, 7, 8, Isopropanol-5, 9, Water-5, 9, Peak Heat Flux-1, Electric Field-4, 6, Horizontal Tube-1. B. Film Boiling-1, Transitional Boiling-1, Nucleate Boiling-2, Destabilized Film Boiling-2, Surface Wetting-2, Electrical Forces-4, 6, Coulomb Attraction-4, Dielectrophoresis-4, Heat Flux-7.

Abstract: Boiling heat transfer to isopropanol from a horizontal, steam-heated, chrome-plated, copper tube 0.375 in. in diameter was increased as much as eight times the normal peak heat flux by the application of up to 10,000 v. d.c. between the liquid and the tube. Heat transfer coefficients observed in the normal film region ranged up to 3,120 B.t.u./hr.-sq. ft.-°F. The process completely eliminated film and transitional boiling above 500 v., and the boiling is nucleate over the entire range of overall temperature difference covered (40° to 260°F.). Similar results were obtained with distilled water. The electricially generated force which destabilizes the film boiling appears to arise from the sum of the condenser effect (coulomb attraction) and dielectrophoresis in a nonuniform electrical field. The results obtained substantiate the theories of surface wetting during transitional boiling.

Simplification of the mathematical description of boundary and initial value problems, Hellums, J. D., and S. W. Churchill, **A.I.Ch.E. Journal, 10,** No. 1, p. 110 (January, 1964).

Key Words: Applied Mathematics-10, Asymptotic Solution-10, Boundary-Layer Theory-8, Boundary Value Problem-8, Condensation-8, Convection-8, Conduction-8, Differential Equations-8, Diffusion-8, Dimensional Analysis-10, Fluid Mechanics-8, Forced Convection-8, Free Convection-8, Group Theory-10, Heat Transfer-8, Laminar Flow-8, Momentum Transfer-8, Natural Convection-8, Partial Differential Equations-10, Scale Up-10, Similar Solutions-10, Similarity Transformations-10, Transformations-10, Transport Phenomena-10.

Abstract: A technique is described which not only yields the least set of parameters which can be used to describe a mathematical model, but also indicates transformations of variables which will reduce the number of variables. The method is particularly useful in choosing and investigating approximations and for finding asymptotic solutions. It should prove applicable in teaching and as a guide to both theoretical and experimental research. The method is first illustrated for several familiar problems in conduction, forced convection, and free convection. Then it is used to produce new results for condensation in the presence of noncondensables.

Vapor condensation in the mixing zone of a jet, Hidy, George M., and S. K. Friedlander, **A.I.Ch.E. Journal, 10,** No. 1, p. 115 (January, 1964).

Key Words: Condensation-8, Vapor-1, Jet-10, Mixing-10, Glycerine-1, Fog-2, Diffusion-6, Nucleation-6, Supersaturation-8, Turbulence-8, Aerosol-2.

Abstract: Experimental studies were made of fog formation in free jets containing condensable vapors. Condensation took place near the nozzle in the mixing between the jet and the ambient air. Measurements of condensation and temperature distributions revealed several new effects and gave information on the condensation mechanism.

Scale of mixing in a stirred vessel, Rice, A. W., H. L. Toor, and F. S. Manning, **A.I.Ch.E. Journal, 10,** No. 1, p. 125 (January, 1964).

Key Words: Mixing-8, Reaction-8, Stirred Tanks-8, Turbine Impeller-8, Baffles-8, Acid-5, Base-5, Water-5, Phenolphthalein-4, Speed-6, Diameter-6, Reaction Time-9, Mixing Scale-9.

Abstract: The scale of subdivision achieved by a flat-bladed turbine impeller is estimated by introducing a basic solution below the impeller and measuring the resulting disk-shaped zone of reaction with the bulk acid solution. Phenolphthalein indicator renders the reaction zone visible. Reaction times are computed with estimated velocity profiles. The base tracer solution is assumed to be sheared into small elements, and the appropriate element size that would react by molecular diffusion in the observed reaction times is calculated. These computed sizes, which are about 10^{-3} to 10^{-5} cm., are compared with the previous work of Manning and Wilhelm.

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ERRATA

Equation (25) of the article "Catalytic Effectiveness in Multicomponent and Variable Diffusivity Systems" by John B. Butt, which appeared on page 707 of the September, 1963, issue of the *A.I.Ch.E. Journal*, should read

$$c_{i\lambda i} = c_{i\Lambda} + c_{A\Lambda}\left(\frac{w_i}{a}\right)\left(\frac{D_{A\Lambda}}{D_{i\Lambda}}\right) \frac{1}{\cosh\left(\sqrt{\frac{k}{D_{A\Lambda}}}\,\Lambda\right)} \left[\cosh\left(\sqrt{\frac{k}{D_{A\Lambda}}}\,\lambda_i\right) - \cosh\left(\sqrt{\frac{k}{D_{A\Lambda}}}\,\Lambda\right)\right]$$

Equations (16), (20), (21), and (24) of the article "The Laminar-Turbulent Transition in Nonisothermal Flow of Pseudoplastic Fluids in Tubes" by R. W. Hanks and E. B. Christiansen, which appeared on page 467 of the September, 1962, issue of the *A.I.Ch.E. Journal*, should read

$$X_{ch} = \left[\frac{f(n)}{1 + 2f(n)}\right]^{\frac{1}{1+f(n)}} \qquad (16)$$

$$r(n) = 1 + 2f(n) \qquad (20)$$

$$R(n, \Delta\Phi, \lambda) = f(n)\left\{(\lambda)^{\frac{1+3n}{n}} + \frac{\frac{1+3n}{n}\exp(\Delta\Phi)}{3 + f(n)}\left[1 - \lambda^{3+f(n)}\right]\right\}^2 \qquad (21)$$

$$\zeta_f^2 = \frac{R(n, \Delta\Phi, \lambda)}{f(n)} \qquad (24)$$