JUNE, 1959 • VOL. 5, NO. 2

A.I.Ch.E. JOURNAL

The A.I.Ch.E. Journal, an official publication of the American Institute of Chemical Engineers, is devoted in the main to theoretical developments and research in chemical engineering and allied branches of engineering and science. Manuscripts should be submitted to the New York office.

PUBLISHER

F. J. Van Antwerpen

EDITOR

Harding Bliss

MANAGING EDITOR

Sylvia Fourdrinier

ASSISTANT PUBLISHER

L. T. Dupree

ADVERTISING MANAGER

P. A. Jolcuvar

ADVISORY BOARD

C. M. Cooper	R. H. Newton
O. E. Dwyer	R. L. Pigford
W. C. Edmister	E. L. Piret
E. R. Gilliland	J. M. Smith
A. N. Hixson	Theodore Vermeuler
H. F. Johnstone	R. R. White
W. R. Marshall, Jr.	R. H. Wilhelm

Publication Office, Richmond, Virginia. Published quarterly in March, June, September, and December by the American Institute of Chemical Engineers, 25 West 45 Street, New York 36 New York 46 New York Manuscripts and other communications should be sent to the New York office. Correspondence with the editor may be addressed to him at Yale University, 225 Prospect Street, New Haven 11, Connecticut. Statements and opinions in the A.I.Ch.E. Journal are those of the contributors, and the American Institute of Chemical Engineers assumes no responsibility for them. Subscriptions: one year, member \$4.50, nonmember \$9.00; two years, member \$7.50, nonmember \$15.00; additional yearly postage, Canada 50 cents. Pan American Union \$1.50, other foreign \$2.00 (foreign subscriptions payable in advance). Single copies: \$3.00. Second-class mail privileges authorized at Richmond, Virginia. Copyright 1959 by the American Institute of Chemical Engineers. National headquarters of A.I.Ch.E. is concerned about nondelivery of copies of the A.I.Ch.E. Journal and urgently requests subscribers to give prompt notification of any change of address. Sixty days must be allowed for changes to be made in the records.

The Sea and the A. E. C.	137	
Mass Transfer at Low Flow Rates in a Packed Column V. P. Dorweiler and R. W. Fahien	139	
Axial Mixing and Extraction Efficiency	145	
Effect of a Volume Heat Source on Free Convection Heat Transfer	150	
Reduced Density Correlation for Hydrogen: Liquid and Gaseous States Charles A. Schaefer and George Thodos	155	
An Improved Equation of State for Gases Joseph J. Martin, Rajendra M. Kapoor, and Noel De Nevers	159	
Solubility of Liquids in Compressed Hydrogen, Nitrogen, and Carbon Dioxide	161	
Interfacial Resistance in the Absorption of Oxygen by Water S. H. Chiang and H. L. Toor	165	
Factors Affecting Density Transients in a Fluidized Bed James M. Dotson	169	
Viscous Flow Relative to Arrays of Cylinders	174	
Mass Transfer from a Solid Sphere to Water in Highly Turbulent Flow	178	
Turbulent Flow of Pseudoplastic Polymer Solutions in Straight Cylindrical Tubes	181	
Turbulent Flow of Non-Newtonian SystemsD. W. Dodge and A. B. Metzner	189	
Characteristics of Transition Flow Between Parallel Plates G. A. Whan and R. R. Rothfus	204	
Treatment of Thermodynamic Data for Homogeneous Binary Systems H. C. Van Ness and R. V. Mrazek	209	
The Molecular Structure of Liquids	212	
Chromatographic Columns Containing a Large Number of Theoretical Plates	223	
Two-dimensional Laminar-Flow Analysis, Utilizing a Doubly Refracting Liquid	225	
Liquid-Side Mass Transfer Coefficients in Packed Towers Kakusaburo Onda, Eizô Sada, and Yasuhiro Murase	235	
The Dynamics of Heat Removal from a Continuous Agitated- Tank Reactor	240	
Turbulent Liquid Flow Down Vertical Walls H. H. Belkin, A. A. MacLeod, C. C. Monrad, and R. R. Rothfus	245	
Phase Equilibria in Mixtures of Polar and Nonpolar Compounds: Derived Thermodynamic Quantities for Alcohols and Hydrocarbons Cline Black	249	
Heat Transfer and Fluid Dynamics in Mercury-Water Spray Columns R. D. Pierce, O. E. Dwyer, and J. J. Martin	257	
Flow Characteristics in Horizontal Fluidized Solids Transport	263	
Effective Diffusivity of Packed Bed	267	
Communications to the Editor		
Physical Interpretation of the Relaxation Method in Heat Conduction	268	
Heat TransferLeonard Wender and G. T. Cooper	269	
Diffusion in a Pore of Irregular Cross Section— a Simplified Treatment	270	
Slot Capacity of Bubble Caps	271	
	277	