

AICHE JOURNAL

MARCH 1978 • VOL. 24, NO. 2

The AIChE Journal, a publication of the American Institute of Chemical Engineers, is devoted to fundamental research and developments having immediate or potential value in chemical engineering.

EDITOR

Robert H. Kadlec

EDITORIAL BOARD

Andreas Acrivos
Charles A. Eckert
R. Dale Biggs
K. C. Chao
James M. Douglas
James R. Fair
George R. Gavallas
Dan Luss
William H. Manogue
Keith McHenry, Jr.
Arthur B. Metzner
Kenneth A. Smith

Publication Office, 215 Canal street, Manchester, New Hampshire. Published in January, March, May, July, September, and November by the American Institute of Chemical Engineers, 345 East 47 Street, New York, New York 10017. Manuscripts should be submitted to Robert H. Kadlec, Editorial Offices, Room 3036, East Engineering Building, The University of Michigan, Ann Arbor, Michigan 48109. Statements and opinions in the *AIChE Journal* are those of the contributors, and the American Institute of Chemical Engineers assumes no responsibility for them. Subscription: one year, \$60; special member rate, \$10; additional yearly postage, Canada \$4.00, Pan American Union \$4.00, other foreign \$4.00 (foreign subscriptions payable in advance). Single copies: \$16.00. Single copies more than one year old: \$17.00. Second-class postage paid at New York, N. Y. and additional mailing offices. Copyright 1978 by the American Institute of Chemical Engineers. National headquarters of AIChE is concerned about nondelivery of copies of the *AIChE 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.

Reproducing copies

The appearance of the code at the bottom of the first page of an article in this journal (serial) indicates the copyright owner's consent that for a stated fee copies of the article may be made for personal or internal use or for the personal or internal use of specific clients. This consent is given on the condition that the copier pay the per-copy fee (appearing as part of the code) through the Copyright Clearance Center, Inc., for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to copying for general distribution, for advertising or promotional purposes, for inclusion in a publication, or for resale.

Articles published before 1978 are subject to the same copyright conditions, except that the fee is 75 cents for each article.

Postmaster: Please send form 3579 to *AIChE Journal*, 345 East 47 Street, New York, N. Y. 10017.

AIChE Symposium Series

Recent Studies

166. Water—1976: I. Physical, Chemical Wastewater Treatment. This volume contains six chapters, each with several papers on advanced water pollution control technology, activated carbon adsorption, ion exchange, electrochemical separation, freezing, reverse osmosis, and ozonization.

1977. 404 pp. AIChE members, \$9; nonmembers, \$20

167. Water—1976: II. Biological Wastewater Treatment. This volume deals generally with conventional wastewater treatment. There are papers on the activated sludge process and papers dealing with an area new to chemical engineers, namely 208 planning.

1977. 327 pp. AIChE members, \$8; nonmembers, \$20

169. Developments in Uranium Enrichment. The papers in this volume provide a comprehensive review of uranium isotope separation technology.

1977. 89 pp. AIChE members, \$5; nonmembers, \$20

170. Intermaterials Competition in the Management of Shrinking Resources. This volume consists of summaries of over fifty papers and panel presentations given in August 1976 at the AIChE meeting in the Materials Engineering and Sciences Division program.

1977. 164 pp. AIChE members, \$7.50; nonmembers, \$20

Order from

American Institute of Chemical Engineers
345 East 47 Street
New York, New York 10017

Also available: standing orders for members. Each book in the series is mailed on publication and billed at a discount of 10 percent.

ASK FOR THE AIChE PUBLICATIONS CATALOG.