

AICHE JOURNAL

AUGUST 1986 • VOL. 32, NO. 8

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

EDITOR

Morton M. Denn

MANAGING EDITOR

Haeja L. Han

EDITORIAL ASSISTANTS

Kathleen A. O'Brien
Karen M. Simpson

CONSULTING EDITORS

Richard Alkire
Electrochemical Engineering

Bruce Finlayson
Computation

Louis Hegedus
Catalysis / Surface Science

Dennis Hess
Electronic Materials

Sheldon Isakoff
Materials

Roy Jackson
Transport Processes

L. Gary Leal
Transport Processes

John Riggs
Materials

Eli Ruckenstein
Transport Processes

Stanley Sandler
Thermodynamics

John Seinfeld
Aerosols / Atmospheric Science

Reuel Shinnar
Reaction Engineering

Michael Shuler
Biochemical Engineering

George Stephanopoulos
Systems / Design

PUBLISHER

J. C. Forman

PUBLICATIONS DIRECTOR

Diane Foster

MANAGER OF EDITORIAL and TECHNICAL SERVICES

Agnes K. Dubberly

AIChE OFFERS SPECIALLY DESIGNED PLANS TO HELP YOU KEEP UP-TO-DATE WITH NEW DEVELOPMENTS IN CHEMICAL ENGINEERING

TO INSURE AUTOMATIC RECEIPT OF AIChE's PUBLICATIONS AS SOON AS THEY ARE PUBLISHED, you may choose to subscribe to AIChE's Publications Package Plans and/or sign up for one or more of our Standing Order Plans.

1986 PUBLICATIONS PACKAGE PLANS include 7 AIChE periodicals plus AIChE Symposium Series titles, the Applications Software Survey for Personal Computers, and Chemical Engineering Faculties at 20% discount off nonmember price. Subscribers may also choose to receive additional titles on our STANDING ORDER PLANS at 15% off nonmember price.

STANDING ORDER PLANS (for those who do not subscribe to the Package Plans) offer members and nonmembers a method for assuring automatic receipt of AIChE publications immediately upon publication.

FOR FULL DETAILS, write to: AIChE, Marketing Dept., 345 East 47 Street, New York NY 10017.

AIChE Journal (ISSN 0001-1541) is published monthly by the American Institute of Chemical Engineers, 345 E. 47th St., New York, NY 10017. Manuscripts should be submitted to Editor Morton M. Denn, at the Dept. of Chemical Engineering, University of California, Berkeley, CA 94720, Phone (415) 643-6591. The statements and opinions in the *AIChE Journal* are those of the contributors, and AIChE assumes no responsibility for them. Annual subscription rates: \$250 for nonmembers, \$40 for members; outside U.S., add \$10 for postage. Single copies: \$25; outside U.S., add \$2 for postage. Second-class postage paid at New York, NY and additional mailing offices. Copyright 1986 by the American Institute of Chemical Engineers. Subscribers are requested to give prompt notification of any change of address. Postmaster: Send changes of address to AIChE Journal, 345 East 47th St., New York, NY 10017.

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by AIChE for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the \$2.00 per copy fee is paid directly to CCC, 21 Congress St., Salem, MA 01970. 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 and the fee for each article is \$2.00. *AIChE Journal* fee code: 0001-1541/86 \$2.00.