

1981 ENGINEERING FOUNDATION CONFERENCES

MIXING VIII

New England College
Henniker, New Hampshire

August 9-14, 1981

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FINAL PROGRAM

Sunday, August 9 1981

3:00 p.m. - 7:00 p.m.

REGISTRATION AND CHECK-IN

7:00 p.m.

DINNER

Monday, August 10, 1981

9:00 a.m. - 10:30 a.m.

MIXING IN POLYMERIZING SYSTEMS

Chairman: W. C. Brasie

This session focuses attention on various mixing tasks required during polymerization.

MODELING OF RAPIDLY MIXED FAST CROSSLINKING EXOTHERMIC POLYMERIZATION

J. Ottino and R. Chella, Univ. of Massachusetts

THE EFFECT OF FLUID MIXING VARIABLES IN SUSPENSION AND EMULSION POLYMERIZATION RESULTS

J. Y. Oldshue and D. Mechler, Mixing Equipment Co.

SIMPLIFIED MODEL FOR MECHANICAL MIXING, DIFFUSION, AND CHEMICAL REACTION IN A SINGLE SCREW EXTRUDER

R. Chella, M. F. Malone and J. M. Ottino, Univ. of Massachusetts

11:00 a.m. - 1:00 p.m.

LAMINAR FLOW MIXING

Chairman: Dave Todd

These papers stress mixing in viscous systems without chemical reaction.

EFFECT OF ELASTICITY ON MIXING OF VISCOELASTIC LIQUIDS

R. Prud'homme, Princeton University

SCREW EXTRUDER MIXING

L. Erwin, M.I.T.

MIXING OF VISCOUS FLUIDS: HELICAL RIBBON VS SCREW

I. Patterson, P. Guerin and P. Carreau, Ecole Polytechnique

Monday, August 10, 1981(continued)

2:00 p.m.-5:00 p.m.

AD HOC SESSION

7:00 p.m.-9:30 p.m.

SELECTED TOPICS IN MIXING

Chairman: Tom Hanley

THREE PHASE MIXING IN LOW VISCOSITY SYSTEMS

J. Fort Kaelin

A. Nienow, C. M. Chapman and J. C. Middleton,
University College London

MIXING IN THREE PHASE SYSTEMS

J. C. Lee, University College of Swansea

A RANDOM WALK BASE INDEX OF DISPERSION

B. H. Kaye, Laurentian University

REACTIVE GAS MIXING

M. B. Lakin and J. D. Groves, Celanese Chemical
Company, Inc.

APPLICATION OF SOME BASIC PRINCIPLES IN THE
DISPERSION OF SOLIDS AND LIQUIDS IN VISCOUS FLUIDS

C. Koen, Consultant

Tuesday, August 11, 1981

~~9:00~~ a.m.-10:30 a.m.

8-30

RESIDENCE TIME DISTRIBUTION AND MIXING

Chairman: D. W. Hubbard

STATE OF THE ART REVIEW OF RESIDENCE TIME THEORY

E. B. Nauman, Rensselaer Polytechnic Institute

STOCHASTIC MODELING OF RESIDENCE TIME DISTRIBUTION

U. Mann, Texas Tech. University

THE DETECTION OF CONCENTRATION FLUCTUATIONS IN
MOVING STREAMS

T. Hanley, Rose-Hulman Institute of Technology

11:00 a.m.-12:30 p.m.

Franco Mayelli

HEAT TRANSFER IN MIXING EQUIPMENT

Chairman: V. Uhl

THE MEASUREMENT OF IMPELLER POWER AND HEAT
TRANSFER COEFFICIENTS USING HEAT FLOW CALORIMETRY

J. Bourne, Swiss Federal Institute of Technology

HEAT TRANSFER IN VESSELS WITH JACKETS OR COILS

V. W. Uhl, University of Virginia

MIXING AND HEAT TRANSFER IN A PADDLE MIXER

W. L. Root, III and E. M. Cook, Stork Bowen Eng.
Inc.

2:00 p.m.-5:00 p.m.

AD HOC SESSION

Tuesday, August 11, 1981(continued)

7:00 p.m.-9:30 p.m.

MIXING FROM AN INDUSTRIAL PERSPECTIVE: PROBLEMS-NEEDS-SOLUTIONS

Chairman: J. Y. Oldshue

UNDESIRABLE MIXING DUE TO BUOYANT FORCES

G. Martin, Shell Development Company

UNSOLVED PROBLEMS OF INDUSTRIAL MIXING; OR WHAT WE DON'T HURTS-A LITTLE, (OR A LOT)

D. G. R. Short and C. W. Etchells, E. I. DuPont de Nemours Co., Inc.

REDUCTION OF CRYSTAL ABRASION IN SOLID SUSPENSION

C. Carpenter, The Monsanto Company

FRUSTRATIONS OF A MIXING TECHNOLOGIST

D. E. Leng, The Dow Chemical Company

THE INFLUENCE OF DRAFT TUBES ON THE BOTTOM VELOCITY AND SUSPENSION CHARACTERISTICS OF SURFACE AGITATED AERATION BASINS

D. L. Bennett, Air Products and Chemicals, Inc.

Wednesday, August 12, 1981

9:00 a.m.-12:30 p.m.

MIXING IN GAS-LIQUID SYSTEMS

Chairman: D. S. Dickey

RUSHTON TURBINES IN GAS-LIQUID SYSTEMS-THE REAL VARIABLES

J. M. Smith and M. Warmoeskerken, Technische Hogeschool Delft

GAS-LIQUID MASS TRANSFER RATES IN HIGHLY VISCOUS COMPLEX RHEOLOGY FLUIDS

Jean Fort
A. W. Nienow, J. Solomon and G. W. Pace, University College of London

CIRCULATION STABILITY AND MIXING IN TALL RECIRCULATING BUBBLE COLUMNS

R. van der Lans and J. M. Smith, Technische Hogeschool Delft

THE DESIGN OF GAS-LIQUID SYSTEMS

T. W. F. Russell, H. W. Blanch, Z. Otero-Schipper and J. N. Filton, University of Delaware

MULTIPHASE MIXING PROBLEMS IN FLOATATION TANKS

C. G. Koen, Consultant

FUNDAMENTALS OF BUBBLE COALESCENCE IN RELATION TO GAS-LIQUID REACTORS

J. C. Lee, University College of Swansea

Wednesday, August 12, 1981(continued)

2:00 p.m.-5:00 p.m.

Mixing Committee
AD HOC SESSION

7:00 p.m.-9:30 p.m.

MIXING IN LIQUID LIQUID SYSTEMS
Chairman: L. L. Tavlaridies

STUDIES IN LAGRANGIAN MOTION FOR THE DISPERSED
PHASE IN LIQUID-LIQUID SYSTEMS
X. B. Reed, University of Missouri-Rolla

LIQUID DISPERSION MECHANISMS IN AGITATED TANKS
G. B. Tatterson, T. P. K. Chang and Y. H. E. Sheu,
Texas A&M University
A. M. Ali, H. H. S. Yuan, University of South
Carolina
D. S. Dickey, Chemineer-Kenics

BREAKAGE FUNCTIONS OF DROPLETS IN STIRRED LIQUID-
LIQUID DISPERSIONS
G. Narsimhan and D. Ramkrishna, Purdue University

MASS TRANSFER IN LIQUID-LIQUID DISPERSIONS
A. M. Hsia, P. M. Bapat and L. L. Tavlaridies,
Illinois Institute of Technology

Thursday, August 13, 1981

9:00 a.m.-12:30 p.m.

MIXING AND SELECTIVITY IN CHEMICAL REACTORS
Chairman: G. K. Patterson

SYNTHESIS OF CHEMICAL PROCESS REACTOR SYSTEMS
R. Govind, University of Cincinnati

MIXING AND FAST REACTION: THE SIZE OF THE
REACTION ZONE
J. R. Bourne, Swiss Federal Institute and
R. N. Sharma, India Institute of Technology

THE SERIES-PARALLEL REACTION; A SOLUTION USING
TOOR'S HYPOTHESIS
R. S. Brodkey and J. Lewalle, Ohio State University

MEASUREMENTS OF TURBULENCE AND SEGREGATION IN A
CHEMICAL REACTOR
G. K. Patterson, University of Missouri-Rolla

A FOUR ENVIRONMENT MODEL OF MIXING AND CHEMICAL
REACTION
R. V. Mehta & J. M. Tarbell, Penn. State Univ.

2:00 p.m.-5:00 p.m.

AD HOC SESSION

7:30 p.m.-9:30 p.m.

SCALE-UP WORKSHOPS
Chairman: D. Coble

Thursday, August 13, 1981 (continued)

This session will have speakers give short presentations on their feelings on scale-up; the successes and limitations. The speakers will then form a panel and participate in an on-the-floor discussion on the subject of scale up.

9:30 p.m.-10:30 p.m.

FOLLOW-UP FROM "RESEARCH NEEDS AND OPPORTUNITIES IN MIXING"

Produced at Mixing VI, Rindge, NH August 21-26, 1977, Bob Adler presiding
Have we made any good starts?

Friday, August 14, 1981

9:00 a.m.-12:00 Noon

8:30

TURBULENCE

Chairman: Bob Edwards

A REVIEW OF TURBULENCE AS IT PERTAINS TO MIXING
R. S. Brodkey, Ohio State University

THE EFFECT OF TURBULENT MIXING ON MASS TRANSFER NEAR INTERFACES FOR LARGE SCHMIDT NUMBERS
C. Petty and R. W. Snellenberger, Michigan State University

FULLY DEVELOPED TURBULENCE IN A CROSSED SHEAR FLOW
X. B. Reed, Jr., D. W. Heineck and J. J. Jost, University of Missouri-Rolla

AN ANALYSIS OF BULK MOTIONS IN A TURBULENT AGITATED TANK
G. B. Tatterson, Texas A&M University

FLOW AND TURBULENCE IN A MECHANICALLY AGITATED MODEL EQUIPMENT FOR CRYSTALLIZATION
I. Fort, Prague Institute for Chemical Technology

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