3. R.L. Geary, S. V. Babu and J. Stephanie, in the Proceedings of the Symposium on Surface and Colloid Science in Computer Technology, K. L. Mittal, Editor, Potsdam, 1985 (in Press)
4. S.V. Babu and V. Srinivasan, *IEEE Trans Electron Dev* **ED-32**, 1896 (1985) and *J.Imaging Tech.* **11**, 168 (1985)
5. J. Pacansky and J. R. Lyerla, *IBM J Res and Dev* **23**, 42, (1979)
6. F. H. Dill, W. P. Hornberger, P. S. Hauge and J. M. Shaw, *IEEE Trans Electron Dev* **ED-22**, 445 (1975)
7. F. H. Dill, A. R. Neureuther, J. A. Tuttle and E. J. Walker, ibid, **ED-22**, 456 (1975)
8. S.V. Babu and E. Barouch, *IEEE Electron Dev Lett* **EDL-7**, 252 (1986)
9. S. V. Babu and E. Barouch and V. Srinivasan, Submitted to *IEEE Trans Electron Dev*
10. S. V. Babu, *IEEE Electron Dev Lett* **EDL-7**, 250 (1986)
11. Sukanek, P. C., "Physical and Chemical Modifications of Photoresist," in P. Stroeve (ed), Chemical and Physical Processing of Integrated Circuits, ACS Symposium Series No. 290, **95**, 1985
12. McAndrews, K. and P. C. Sukanek, "Nonuniform Wet Etching of Silicon Dioxide," submitted for publication.
13. W. L. Morgan, JILA Information center report No. 19, Boulder, Colorado, 1979
14. V. Srinivasan, M. S. Sivasubramanian, and S. V. Babu, Proceedings of the 7th International Plasma Chemistry Symposium, p1405, C. J. Timmermans (Editor), Eindhoven, 1985; and T. Daubenspeck and S. V. Babu (to be published)
15. Sullivan, G. and P. C. Sukanek, "A Simple Model for Reactive Ion Etching of Silicon Dioxide," submitted for publication
16. R. D. Rust, R. J. Rhodes, and A. A. Parker, *Solid State Tech* **27(4)**, 270 (1984)
17. S. V. Babu, L. Tiemann, and R. E. Partch, Proceedings of the 7th International Plasma Chemistry Symposium, p1025, C. J. Timmermans (Editor), Eindhoven, 1985
18. J. F. Rembetski, M.S. Thesis, Clarkson University (1985), and J. F. Rembetski, W. E. Mlynko, J. G. Hoffarth, and S. V. Babu, ibid, p1100
19. R. J. Jensen, J. P. Cummings, and H. Vora, *IEEE Trans Comp Hybrids and Manuf Tech* **CHMT-7**, 384 (1984)
20. V. Srinivasan, M. Smrtic, and S. V. Babu, *J App Phys* **59**, 3861 (1986)
21. M. Ritz and S. V. Babu, (unpublished)
22. M. Armacost, M.S. Thesis, Clarkson University (1986) □

AUTHOR INDEX

A

Abbott, Michael M. ---------- XVIII,50; XIX,62
Abd-El-Bary, M.F. ---------- XVI,118; XVII,28
Abdul-Kareem, H.K. ---------- XVII,78
Abraham, W.H. ---------- XVII,103
Afacan, Artin ---------- XVIII,132
Ahmed, Moin ---------- XVII,46
Alonso, J. ---------- XVII,34
Amundson, Neal R. ---------- XX,168
Andrews, Graham F. ---------- XVIII,112
Aris, Rutherford -- XVI,50; XVII,10,53; XX,77
Asfour, Abdul-Fattah A. ---------- XIX,84
Azevedo, E.G. ---------- XX,7

B

Baasel, William D. ---------- XVI,26
Babu, S.V. ---------- XX,186
Baer, A.D. ---------- XVI,56
Bailey, J.E. ---------- XIX,168
Bailie, Richard C. ---------- XIX,182
Baird, Donald G. ---------- XVI,174; XVIII,73
Baldwin, L.B. ---------- XVII,70
Barber, Martin S. ---------- XIX,2
Barduhn, Allen J. ------- XVIII,38,102; XIX,171
Barker, Dee H. ---------- XVI,182
Bartholomew, Calvin H. ---------- XVIII,180
Beckmann, Robert B. ---------- XVIII,37; XIX,6
Belfort, Georges ---------- XIX,172
Bell, Kenneth J. ---------- XVI,108
Bethea, R.M. ---------- XVI,167
Bird, R. Byron ---------- XVII,184; XX,160
Black, James H. ---------- XIX,118
Blackmond, Donna G. ---------- XX,174
Bolles, William I. ---------- XVII,137
Bonin, Hugues W. ---------- XVIII,60
Brainard, Alan J. ---------- XVII,105
Brestovansky, D.F. ---------- XVI,76
Britten, Jerald A. ---------- XVIII,140
Brodkey, Robert S. ---------- XX,202
Bungay, H.R. ---------- XX,122
Burnet, George ---------- XX,101
Burnet, John ---------- XVII,112
Buxton, Brian ---------- XIX,144

C

CACHE Corporation ---------- XX,19
Cadman, T.W. ---------- XIX,6
Carberry, J.J. ---------- XVI,107
Case, Stuart M. ---------- XVI,98
Cassano, Alberto E. ---------- XIX,35
Chao, K.C. ---------- XX,66
Chari, Sriram ---------- XVI,118
Charos, Georgios N. ---------- XX,88
Chau, Pao C. ---------- XIX,150
Chawla, Ramesh C. ---------- XVIII,30
Chen, W.H. ---------- XX,181
Chen, W.J. ---------- XX,82
Cilento, E.V. ---------- XVII,110
Clancy, Paulette ---------- XIX,78,132; XX,88
Clark, J. Peter ---------- XVI,34
Clements, L.D. ---------- XVI,167
Collins, E.V. ---------- XIX,45
Conger, William L. ---------- XVII,98
Converse, Alvin O. ---------- XVIII,186
Corripio, Armando B. ---------- XVIII,14
Cosgrove, Stanley ---------- XVI,6
Couey, Paul R. ---------- XX,4
Coughlin, Robert W. ---------- XVI,98
Coulman, George A. ---------- XX,124
Crosser, O.K. ---------- XIX,68
Culberson, Oran L. ---------- XVI,205
Cussler, E.L. ---------- XVIII,124

D

Dale, Dick ---------- XVII,94
Datye, Abhaya K. ---------- XX,198
Daubert, Thomas E. ---------- XVII,108
Davis, Mark E. ---------- XVII,144
Debelak, Kenneth A. ---------- XVI,72
Debenedetti, Pablo G. ---------- XVIII,116
Delcamp, Robert ---------- XVI,6
Delgass, W. Nicholas ---------- XX,60
De Nevers, Noel ---------- XVI,186; XVIII,128
Denn, Morton M. ---------- XX,18
Deshpande, Pradeep B. ---------- XIX,44; XX,43
Desrosiers, Ray E. ---------- XX,94
Dixon, A.G. ---------- XVII,138
Duda, J.L. ---------- XVIII,156; XX,164
Dullien, F.A.L. ---------- XVI,164
Dussan V., Elizabeth ---------- XVIII,160

E

Edie, Dan D. ---------- XVII,2; XVIII,196
Elliott, David ---------- XVIII,136
Elorriaga, Javier Bilbao ---------- XVIII,74
Engel, Alfred J. ---------- XVII,77
Eubank, P.T. ---------- XVII,124

F

Fahidy, T.Z. ---------- XX,77
Fahien, Ray W. ---------- XX,3,100,163
Fair, James R. ---------- XVIII,190
Falconer, John L. ---------- XVIII,140
Fan, L.T. ---------- XVIII,109
Farquhar, Brodie ---------- XIX,110
Felder, Richard M. ---------- XIX,12, 176
Fenn, John B. ---------- XVI,190
Finlayson, Bruce A. ---------- XIX,35; XX,150
Fogler, H.S. ---------- XVIII,98
Foord, A. ---------- XIX,136
Frank, Curtis W. ---------- XVI,122
Frank, David V. ---------- XVII,117
Fredrickson, A.G. ---------- XVII,64

Friedly, John C. ---------- XVII,27
Furgason, Robert R. ---------- XX,58

G

Gallinger, Floyd H. ---------- XX,28
Gates, B.C. ---------- XVII,16
Glandt, Eduardo D. ---------- XVII,50; XX,110
Golnaraghi, Maryam ---------- XIX,132
Gomez, Roman ---------- XVI,132,196
Gonzalez-Velasco, Juan Ramon ---------- XVIII,74
Goodrow, Carol A. ---------- XVI,44
Graham, B.P. ---------- XIX,186
Green, Alex E.S. ---------- XIX,203
Greenberg, David B. ---------- XVI,6; XVIII,199
Grethlein, Hans E. ---------- XVIII,186
Griffin, Ann ---------- XVII,74
Grosschmid, P.P. ---------- XVIII,66
Grulke, Eric A. ---------- XX,128
Gubbins, Keith E. ---------- XIX,78,132; XX,77,88
Gupta, Santosh K. ---------- XX,84

H

Hadley-Coates, Lyndon ---------- XX,69
Haile, J.M. ---------- XVII,2; XVIII,19
Hall, K.R. ---------- XVII,124
Hallman, John R. ---------- XVI,29
Halpern, Bret L. ---------- XVII,86
Hanesian, Deran ---------- XVIII,56
Hanna, O.T. ---------- XIX,82
Hanyak, Michael E. ---------- XIX,26
Harpell, John L. ---------- XX,92
Haseman, Jeffrey T. ---------- XVII,112
Hassler, J.C. ---------- XVII,24
Hau, Shau-Drang ---------- XVIII,10,64
Hayhurst, David T. ---------- XIX,198
Haynes, Jr., Henry W. ---------- XX,22
Hecker, William C. ---------- XVIII,180
Heichelheim, H.R. ---------- XVI,167
Heist, Richard ---------- XX,50
Henley, Ernest J. ---------- XVII,32; XVIII,144
Henry, Jr., Joseph D. ---------- XIX,182
Herskowitz, M. ---------- XIX,148
Hightower, Joe W. ---------- XVI,148
Hill, Jr., Charles G. ---------- XVIII,92
Hoflund, Gar B. ---------- XX,83
Holste, J.C. ---------- XVII,124
Homsy, George M. ---------- XVI,122
Howard, William K. ---------- XX,36
Huckaba, Charles E. ---------- XVII,74
Hudgins, R.R. ---------- XVIII,91; XIX,135

I

Illinois Colleagues ---------- XVIII,6
Isbin, Herbert S. ---------- XVII,77

J

Jacquot, R.G. ---------- XVII,70
Jenkins, Daniel J. ---------- XVI,110
Johnston, Keith P. ---------- XIX,203
Jolls, Kenneth R. ---------- XVII,72,112
Jones, Vickie ---------- XVI,56
Jorne, Jacob ---------- XX,178
Joseph, Babu ---------- XVIII,136
Joye, Donald D. ---------- XIX,30
Jutan, A. ---------- XIX,186

K

Karim, M. Nazmul ---------- XVIII,122
Kauffman, David ---------- XIX,208
Kessler, D.P. ---------- XX,66
Kilcup, J. Elizabeth ---------- XX,116
Kim, Sangtae ---------- XX,152
King, C. Judson ---------- XX,121
King, Franklin G. ---------- XVIII,30
Kono, Hisashi O. ---------- XIX,182
Koppel, Lowell B. ---------- XVII,58; XX,70
Kummler, R.H. ---------- XVIII,98
Kuri, Carlos J. ---------- XVIII,14
Kut, O.M. ---------- XIX,128

L

Lane, Michael S. ---------- XX,92
Lauffenburger, Douglas A.
---------- XVII,50; XVIII,160; XX,110
Laukhuf, Walden L.S. ---------- XX,43
Lawson, David W. ---------- XVI,44
Lee, H.H. ---------- XVII,85
Lee, P.L. ---------- XIX,36
Leise, Thomas H. ---------- XVI,110
Lemlich, Robert ---------- XVI,6
Lenzi, J. ---------- XVIII,88
Leung, L.S. ---------- XIX,36
Levenspiel, Octave ---------- XVI,24; XX,7
Licht, William ---------- XVI,6
Lightfoot, E.N. ---------- XIX,29
Lin, Hsin-Ying ---------- XX,78
Little, Julia E. ---------- XVII,54
Lomas, D. ---------- XVII,34
Luecke, Richard H. ---------- XX,78
Luss, Dan ---------- XX,12

Mc

McAvoy, Thomas J. ---------- XVI,88,94
McConica, Carol M. ---------- XVIII,200
McCullough, R.L. ---------- XVI,76
McGee, Jr., Henry A. ---------- XX,127
McGuinness, N. ---------- XVII,6
McKelvey, James M. ---------- XIX,25

M

Mallinson, Richard G. ---------- XVI,126
Malmary, G. ---------- XVIII,88
Mankowski, G. ---------- XVIII,88
Mansour, Ali H. ---------- XX,92
Marnell, Paul ---------- XVIII,164
Martin, Joseph H, ---------- XVII,119
Martinez, Enrico N. ---------- XVI,132,196
Masliyah, Jacob ---------- XVIII,132
Mason, G. ---------- XIX,136
Matteson, Michael J. ---------- XVIII,110
Messler, Russell ---------- XVI,152
Mewis, Jan ---------- XVIII,82
Middleman, Stanley ---------- XVII,170; XIX,150
Minderman, Peter A. ---------- XVI,114
Molinier, J. ---------- XVIII,88
Moo-Young, Murray ---------- XX,194
Moser, William R. ---------- XIX,156
Mumme', K.I. ---------- XVII,24
Myers, Alan L. ---------- XVI,18

N

Nagarajan, R. ---------- XIX,193
Naik, Chandrashekhar D. ---------- XIX,78
Newell, R.B. ---------- XIX,36
Noble, Richard D. --- XVII,20,70,134; XIX,162

O

Obot, Nsima T. ---------- XX,40
O'Connell, John ---------- XVII,94
Ollis, D.F. ---------- XIX,168
Oreovicz, Frank S. ---------- XVII,178

P

Pallai, I.M. ---------- XVIII,66
Paterson, W.R. ---------- XIX,124
Patterson, G.K. ---------- XVIII,203
Peppas, Nicholas A. ---------- XVI,126; XX,60
Pigford, R.L. ---------- XVII,16
Prausnitz, J.M. ---------- XIX,22; XX,7
Pritchard, Colin ---------- XX,132

Q

Queralt, R ---------- XIX,128

R

Radovic, Ljubisa R. ---------- XIX,204
Ramanarayanan, Kuttanchery A. ---------- XX,36
Ramkrishna, D. ---------- XVI,43,82
Rao, Y.K. ---------- XIX,40
Ravichandran, V. ---------- XIX,140
Rawling, Jr., F.L. ---------- XVIII,9
Reif, Rafael ---------- XVII,148
Ricker, N.L. ---------- XVI,93
Robertson, Channing R. ---------- XVI,122
Rochefort, Skip ---------- XIX,150
Romeo, Ronald A. ---------- XVI,44
Rose, L.M. ---------- XIX,128
Rosner, Daniel E. ---------- XVII,141
Roth, John A. ---------- XVI,72
Ruijter, Kees ---------- XVIII,34
Russell, T.W.F. ---------- XVI,76; XIX,72
Ryan, Norman W. ---------- XIX,114

S

Sandler, Stanley I. ---------- XX,144
Sawin, Herbert H. ---------- XVII,148
Scamehorn, John F. ---------- XVIII,166
Schrader, G.L. ---------- XVII,16
Schrodt, Verle N. ---------- XX,135
Schruben, Dale L. ---------- XX,48
Schultz, Jerome S. ---------- XVI,2
Seader, J.D. ----- XVII,139; XVIII,128; XIX,88
Seapan, Mayis ---------- XVI,168
Sears, J.T. ---------- XVII,110
Seider, Warren D. ---------- XVIII,26
Seinfeld, John H. ---------- XVI,121
Serageldin, Mohamed ---------- XVII,174
Shaeiwitz, Joseph A. ---------- XVII,152
Shah, D.B. ---------- XVIII,170; XIX,198
Sherwood, T.K. ---------- XIX,121
Siirola, J.J. ---------- XVI,68,138
Silla, Harry ---------- XX,44
Silveston, P.L. ---------- XVII,78
Simmons, George M. ---------- XVII,182
Skaates, J.M. ---------- XVI,178; XX,136
Slattery, John C. ---------- XVIII,2
Sloan, E. Dendy ---------- XVI,38
Smith, Douglas M. ---------- XX,198
Smith, Julian C. ---------- XIX,58
Snyder, William J. ---------- XIX,26
Sommerfeld, Jude T.
---------- XVI,114; XVIII,110; XX,138
Soong, David S. ---------- XIX,190
Squires, R.G. ---------- XVII,104,117
Stainthorp, F.P. ---------- XVII,34
Steen, Paul H. ---------- XIX,58
Stephanopoulis, George ---------- XX,182
Stewart, Warren E. ---------- XVIII,204
Stokes, Vijay Kumar ---------- XVI,82
Storvick, Truman S. ---------- XVIII,139; XX,21
Stroeve, Pieter ---------- XX,8

Sukanek, Peter ---------- XX,186
Sullivan, Gerald R. ---------- XX,70
Sullivan, Ralda M. ---------- XX,32
Sullivan, William G. ---------- XVI,95
Sussman, Martin V. ---------- XVII,128,161

T

Taber, Joyce ---------- XIX,54
Takoudis, Christos G. ---------- XVII,158
Tarbell, John M. ---------- XVI,110
Tarrer, A. Ray ---------- XX,74
Tavlarides, Lawrence L. ---------- XVIII,102
Taylor, Ross ---------- XVI,158
Thomas, David G. ---------- XIX,17
Thomson, William J. ---------- XVII,182
Timmerhaus, Klaus D. ---------- XIX,83; XX,181
Tjahjadi, Mahari ---------- XX,84

U

Uhl, Vincent W. ---------- XVI,30; XIX,10
Ungar, Lyle ---------- XVIII,160
Utomo, Tjipto ---------- XVIII,34

V

Valderrama, Jose O. ---------- XVIII,70; XX,102
Valle-Riestra, J. Frank ---------- XVII,162
Van Ness, H.C. ---------- XIX,62
Van Zee, John ---------- XIX,194
Varma, Arvind ---------- XVII,176
Venkatasubramanian, V. ---------- XX,188
Vilimpochapornkul, Viroj ---------- XX,40

W

Walker, Charles A. ------ XVI,102; XVII,86,196
Wankat, Phillip C. ---------- XVII,178; XVIII,20
Watson, Keith R. ---------- XIX,44
Wei, James ---------- XIX,120
Weiland, Ralph H. ---------- XVI,158
Weir, Ronald D. ---------- XVIII,60
Westerberg, Arthur W. - XVI,12,62; XVIII,159
Wheelock, T.D. ---------- XVIII,185
Whitaker, Stephen ---------- XIX,18
White, Mark G. ---------- XVIII,174
Whiting, Wallace B. ---------- XX,35
Whitmyre, Jr., George ---------- XX,144
Wilkes, Garth L. ---------- XVI,174
Williams, Dennis C. ---------- XX,74
Williams, Frank L. ---------- XX,198
Williams, Joyce B. ---------- XX,7
Willis, Max S. ---------- XIX,185
Wong, Julius P. ---------- XIX,44
Wood, Philip E. ---------- XX,28
Woods, Donald R.
---------- XVI,44; XVII,166; XVIII,106; XX,28

Y

Yeow, Y.L. ---------- XVIII,78

Z

Zabicky, Jacob ---------- XX,148
Zhang, Guo-Tai ---------- XVIII,10,64
Zygourakis, Kyriacos ---------- XVIII,176

TITLE INDEX

A

Accreditation: Plus or Minus ---------- XX,58
Accreditation, and Computing Technology; Design ---------- XX,18
Adjoint Variables and Their Role in Optimal Problems, The Nature of ---------- XIX,68
Adjunct Position: One Way to Keep Up With Technology and Education ---------- XIX,162
Adsorption Methods, New ---------- XVIII,20
Aerosol Science, Introduction to* ---------- XIX,203
Air Pollution for Engineers ---------- XVI,168
Algebra for Chemical Engineers, Linear ---------- XVIII,176
Analysis and Design, Chemical Reactor* ---------- XVII,176
Applied Mathematics in Chemical Engineering ---------- XVIII,160
Artificial Intelligence in Process Engineering: Course ---------- XX,188
Artificial Intelligence in Process Engineering: Research ---------- XX,182
ASEE, Why I Belong To ---------- XX,121
Availability (Exergy) Analysis* ---------- XVII,139
Availability Functions, A Graphic Look at ---------- XVII,128
AWARD LECTURES
- Design Research: Both Theory and Strategy ---------- XVI,12,62
- Image Processing and Analysis For Turbulence Research ----- XX,202
- Input Multiplicities in Process Control ---------- XVII,58
- Semiconductor Chemical Reactor Engineering and Photovoltaic Unit Operations ---------- XIX,72
- Simulation and Estimation by Orthogonal Collocation ------- XVIII,204
- Steady-State Multiplicity Features of Chemically Reacting Systems ---------- XX,12

B

Bio-Chemical Conversion of Biomass ---------- XVIII,186
Biochemical Engineering: With Extensive Use of Personal Computers ---------- XX,122
Biochemical Engineering and Industrial Biotechnology ---------- XX,194
Biochemical Engineering Fundamentals ---------- XIX,168
Biomass, Bio-Chemical Conversion of ---------- XVIII,186
Biomedical Education, Trends in ---------- XVI,126
Boiler House, Exploiting the On-Campus ---------- XX,28
Book Writing and ChE Education ---------- XVII,184
Boundary Layer Theory for Momentum, Heat and Mass Transfer, Foundations of* ---------- XIX,82

C

Calculations, Degrees of Freedom and Precedence Orders in Engineering ---------- XX,138
Calculator, Distillation Calculations With a Programmable ------- XVII,86
Career Planning and Motivation Through an Imaginary Company Format ---------- XVI,44
Carnegie-Mellon University, The History of Chemical Engineering at* ---------- XVIII,37
Catalysis ---------- XVIII,180
Catalysis, A Survey Course in ---------- XVI,178
Catalysis Demonstrations, Kinetics and ---------- XVIII,140
Catalysis Involving Video-Based Seminars, Heterogeneous ----- XVIII,174
Catalyst Manufacture: Laboratory and Commercial Preparations* ---------- XVIII,92
Cheating—An Ounce of Prevention ---------- XIX,12
Chemical Engineering: A Crisis in Maturity ---------- XX,178
Chemically Reacting Systems, Steady-State Multiplicity Features of ---------- XX,12
Chemicals in the Environment: Distribution—Transport—Fate—Analysis* ---------- XVII,77
Coal Utilization and Conversion Processes, Fundamentals of ----- XIX,204
Collocation, Simulation and Estimation by Orthogonal ---------- XVIII,204
Colloid and Surface Science ---------- XVIII,166
Combustion ---------- XVII,174
Communication to Undergraduates, Teaching Technical ---------- XX,32
Communications Skills Through a Laboratory Course, The Development of ---------- XVI,122
Computational Methods for Turbulent, Transonic, and Viscous Flows* ---------- XVIII,203
Computers, A New Approach to Teaching ChE Using ---------- XVIII,66
Computer-Assisted Laboratory Stations ---------- XIX,26
Computer-Generated Phase Diagrams for Binary Mixtures ------- XVII,112
Computer Graphics, The Representation of Highly Non-Ideal Phase Equilibria Using ---------- XX,88
Computer Graphics Approach to the Use of the Integral Method in Kinetics, A ---------- XX,136
Computer Graphics to Teach Thermodynamic Phase Diagrams, The Use of ---------- XIX,78
Computer Process Control, A Microcomputer Based Laboratory for Teaching ---------- XVIII,136
Computer Programs for Chemical Engineers, Selected Numerical Methods and* ---------- XVII,196
Computer Programs for Equipment Cost Estimation and Economic Evaluations of Chemical Processes, Two ---------- XVIII,14
Computer Usage in Design Courses: Survey ---------- XVII,32
Computing Technology; Design, Accreditation, and- ---------- XX,18

*Book Review

Computing Technology, Expectations of the Competence of ChE Graduates in the Use of ---- XX,19
Controlled Processes With Dead-Time, Simulation of Simple ---- XIX,44
Corcoran, William H.; Outstanding Paper Award ---- XX,180
Corrosion, Teach ---- XX,69
Corrosion Engineering, Electrochemical and ---- XIX,194
Cost Engineering, Applied* ---- XIX,118
Cost Estimation and Economic Evaluation of Chemical Processes, Two Computer Programs for Equipment ---- XVIII,14
Creativity in Students, Toward Encouraging ---- XIX,22
Curriculum, An Integrated Approach to ---- XX,92
Curriculum, The Chemical Engineering: 1985 ---- XX,124

D

Dead-Time, Simulation of Simple Controlled Processes With ---- XIX,44
DEPARTMENTS OF CHEMICAL ENGINEERING
California, University of: Davis ---- XX,8
Cincinnati, University of ---- XVI,6
Clemson University ---- XVII,2
Cornell University ---- XIX,58
Delft University of Technology ---- XVII,54
Erevan Polytechnic Institute ---- XVIII,56
Kentucky, University of ---- XVII,98
Maryland, University of ---- XIX,6
Minnesota, University of ---- XVI,50
Northwestern University ---- XVIII,2
Pennsylvania, University of ---- XX,110
Purdue University ---- XX,60
Syracuse University ---- XVIII,102
Utah, University of ---- XIX,114
Yale University ---- XVI,102
Design, Accreditation, and Computing Technology ---- XX,18
Design, Chemical Process: An Integrated Teaching Approach ---- XVI,72
Design, Chemical Reactor ---- XVII,158
Design, Chemical Reactor Analysis and* ---- XVII,176
Design, Probabilistic Engineering: Principles and Applications* ---- XVIII,144
Design, Using Spreadsheets for Teaching ---- XX,128
Design Course, Development and Critique of the Contemporary Senior ---- XVI,30
Design Course in Groups, An Experiential ---- XVI,38
Design Courses, Computer Usage in: Survey ---- XVII,32
Design Laboratory, Development of the ---- XX,44
Design Laboratory Experiment for Separating Particles by Fluidization Principles, A Sequential ---- XIX,30
Design of Industrial Chemical Reactors From Laboratory Data* - XVII,46
Design Problems, Thermodynamics With ---- XVII,110
Design Research: Both Theory and Strategy ---- XVI,12,62
Differential Equation Models by Polynomial Approximation, Solution of* ---- XVI,43
Diffusion in Liquids* ---- XIX,29
Diffusive Mass Transport, A Note on ---- XX,22
Digital Computer Application in Process Control ---- XVI,118
Digital Control Liquid Level Experiment, Direct ---- XVII,28
Dimensionless Education ---- XVIII,112
Discrete Processes in Undergraduate Process Control Courses ---- XX,78
Distillation, Setting the Pressure at Which to Conduct a ---- XVIII,38
Distillation Calculations With a Programmable Calculator ---- XVII,86
Distillation With Vapour Compression ---- XX,132
Division Activities - XVI,67,176; XVII,97; XVIII,53,159; XIX,119; XX,167
Dolphin Problem, The ---- XVI,24
Drying of Solids, Tray ---- XVIII,132

E

Economic Decision Analysis, What Every Engineer Should Know About* ---- XVI,95
Economic Evaluation of Chemical Processes, Two Computer Programs for Equipment Cost Estimation and ---- XVIII,14
Economics, Introduction to Process* ---- XIX,10
EDITORIALS
Olaf Hougen: Teacher, Researcher, Educator ---- XX,163
Ratings, Race, The ---- XX,3
Service or Ratings? ---- XX,100
EDUCATORS, CHEMICAL ENGINEERING
Alkire, Richard C., of Illinois ---- XVIII,6
Bell, Ken, of Oklahoma State ---- XX,4
Bennett, C.O., of Connecticut ---- XVI,98
Greenkorn, Robert A., of Purdue ---- XX,66
Gulari, Esin and Erdogan, of Wayne State and Michigan ---- XVIII,98
Hightower, Joe, of Rice ---- XIX,54
Martin, Joe, of Michigan ---- XVI,2
Quinn, John A., of Pennsylvania ---- XVII,50
Schmitz, Roger A., of Notre Dame ---- XX,116
Seader, J.D., of Utah ---- XVI,56
Shah, Dinesh, of Florida ---- XVII,94
Sloan, Dendy, of Colorado School of Mines ---- XIX,110
Smith, J.M., of California-Davis ---- XVII,6
Timmerhaus, Klaus D., of Colorado ---- XIX,2
Van Ness, Hank, of Rensselaer ---- XVIII,50
Electrochemical and Corrosion Engineering ---- XIX,194
Electronic Materials, The Processing of ---- XX,186
Elementary Chemical Engineering* ---- XIX,45
Energy Conservation Principles, The Integration of into a Course on Staged Operations ---- XVI,88
Engineering Education and Practice in the United States* ---- XX,101
Engineering Graduate Education and Research* ---- XX,181
Engineering Research Centers, The New* ---- XX,181
Equilibrium-Stage Operations, The B.C. (Before Computers) and A.D. of ---- XIX,88
Ethics, Teaching Professional ---- XVIII,106
Exergy, The Thermodynamic Fundamentals of ---- XVIII,116
Experiment, A Nonideal Flow ---- XVIII,74
Experiment, An Improved Design of a Simple Tubular Reactor --- XIX,84
Experiment for the Transient Response of a Stirred Vessel, Laboratory ---- XVII,70
Experiments in CRE, $12 for a Dozen ---- XVIII,10
Extraction, Metals Separation by Liquid ---- XVIII,88
Extraction, Transport Phenomena in Liquid* ---- XVI,93

F

Film, Ripple in a Falling ---- XX,48
Finite Elements: Mathematical Aspects* ---- XIX,35
First- and Second-Law Statement, The Two Lost-Work Statements and the Combined ---- XVIII,128
Flow Curve Determination for Non-Newtonian Fluids ---- XX,84
Fluid Flow, The Practical Use of Theory in* ---- XIX,17
Fluid Flow and Heat Transfer* ---- XVI,108
Fluid Flow Experiment for Undergraduate Laboratory ---- XX,40
Fluid Mechanics and Unit Operations* ---- XVIII,199
Fluid Properties and Phase Equilibria, Estimation of ---- XIX,148
Fluidization ---- XIX,182
Fluidization Principles, A Sequential Design Laboratory Experiment for Separating Particles by ---- XIX,30
Fluidized-Bed Chemical Processes, Fundamentals of* ---- XVIII,109
Fluxes in Continuous Media, Tensorial Nature of- ---- XVI,82
Fuels, Alternative: Chemical Energy Resources* ---- XVII,85
Fugacity, Residual Functions and ---- XVII,124

G

Gamma Distribution, A Physical Interpretation for the ---- XX,36
Generic Quiz, The ---- XIX,176
Geometrical Derivation of the Spatial Averaging Theorem, A Simple ---- XIX,18
Gibbs Phase Rule, Extended Form of the ---- XIX,40
Graduate Education in Chemical Engineering ---- XX,174
Graduate Education in Mexico ---- XVI,196
Graduate Education Wins in Interstate Rivalry ---- XVII,182
Graduate Residency at Clemson ---- XVIII,196
Graduate School, Common Misconceptions Concerning ---- XVIII,156
Graduate School Worth It?, Is ---- XIX,208

*Book Review

Graduate Studies: The Middle Way ---------- XX,164

H

Heat, and Mass Transfer, Momentum* ---------- XIX,193
Heat and Mass Transfer, Advanced Topics in ---------- XVII,152
Heat Transfer, Fluid Flow and* ---------- XVI,108
Heterogeneous Catalysis Involving Video-Based Seminars ------ XVIII,174
Hotdog, Thermal Conductivity of a ---------- XVIII,110
Hougen's Principles ---------- XX,161
Hydraulic Analog Methods to Develop Kinetic Rate Equations From Laboratory Data, Using ---------- XVIII,64
Hydraulic Conveying of Solids, Pneumatic and* ---------- XVIII,185
Hygiene Aspects of Plant Operations, Industrial ---------- XIX,83

I

Ice Cubes Problem, Melting ---------- XVI,114
Ice Rink Problem ---------- XVI,94
Image Processing and Analysis for Turbulence Research ---------- XX,202
Industrial and Engineering Chemistry: Integrating Chemistry and Engineering ---------- XVII,16
Industrial Experimentation, Optimization and* ---------- XVI,167
Industry, The Chemical Engineer in the Chemical ---------- XX,148
Information Science Training for Chemical Engineers, Basic ------ XIX,128
Input Multiplicities in Process Control ---------- XVII,58
Integral Method in Kinetics, A Computer Graphics Approach to the Use of the ---------- XX,136
Interstate Rivalry, Graduate Education Wins in ---------- XVII,182

J

Job Hunting, The Graduate Student's Guide to Academic --------- XVII,178

K

Kinetic Rate Equations From Laboratory Data, Using Hydraulic Analog Methods to Develop ---------- XVIII,64
Kinetics, A Computer Graphics Approach to the Use of the Integral Method in ---------- XX,136
Kinetics and Catalysis Demonstrations ---------- XVIII,140

L

Laboratory, A Junior Year ChE ---------- XIX,124
Laboratory Engineering and Manipulations* ---------- XVI,29
Letters to the Editor ---------- XVII,72,103,161; XVIII,73,109; XIX,35,135,171; XX,7,77,167
Linear Algebra for Chemical Engineers ---------- XVIII,176
Linear Operator Methods in ChE* ---------- XX,152
Liquids and Liquid Mixtures* ---------- XX,77
Liquid Extraction, Metals Separation by ---------- XVIII,88
Liquid Extraction, Transport Phenomena in* ---------- XVI,93
Liquid Filtration* ---------- XIX,185
Liquid Level Experiment, Direct Digital Control ---------- XVII,28
Lost-Work Statements and the Combined First- and Second-Law Statement, The Two ---------- XVIII,128

M

Mass Transfer ---------- XVI,158
Mass Transfer, Advanced Topics in Heat and ---------- XVII,152
Mass Transfer, Momentum, Heat, and* ---------- XIX,193
Mass Transfer in Engineering Practice* ---------- XVIII,9
Mass Transfer Seem Difficult, How We Make ---------- XVIII,124
Mathematical Understanding of ChE Systems, The: Selected Papers of Neal R. Amundson* ---------- XVI,121

MEMORIAM, IN

Corcoran, William H. ---------- XVI,157
Erbar, J.H. ---------- XVIII,19
Hougen, Olaf Andreas ---------- XX,160
Martin, Joseph J. ---------- XVII,73
Peck, Ralph E. ---------- XVII,23
Peiffer, Charles ---------- XIX,211
Spellman, Lloyd A. ---------- XVI,125
Vermeulen, Ted ---------- XVIII,87

Metals Separation by Liquid Extraction ---------- XVIII,88
Mexico, Graduate Education in ---------- XVI,196
Mexico, Recent Development of ChE Education in- ---------- XVI,132
Microcomputer, Pulse Testing With a ---------- XVIII,78
Microcomputer, The Laboratory* ---------- XX,50
Microcomputer Based Laboratory for Teaching Computer Process Control, A ---------- XVIII,136
Mine-Mouth Geyser Problem ---------- XVI,186
Modular Instruction Under Restricted Conditions ---------- XVIII,34
Modeling, Numerical Methods and ---------- XVII,144
Modeling for Chemical Engineers, Numerical Methods and* ------- XX,150
Modelling, An Exercise in: One Month Problem ---------- XIX,140
Modelling at Royal Military College, Teaching Simulation and --- XVIII,60
Molecular Fluids, Theory of* ---------- XIX,203
Molecular Sieve Technology ---------- XIX,198
Molecular Structure and Reactivity, A Pictorial Approach to* ------- XX,83
Momentum, Heat, and Mass Transfer* ---------- XIX,193
Multicomponent Distillation, Fundamentals of* ---------- XVII,137
Multiplicity Features of Chemically Reacting Systems, Steady-State ---------- XX,12

N

Non-Newtonian Fluids, Flow Curve Determination for ---------- XX,84
Nonideal Flow Experiment, A ---------- XVIII,74
Nonlinear Analysis in Chemical Engineering* ---------- XVII,138
Nuclear Chemical Engineering* ---------- XVII,77
Nucleate Boiling ---------- XVI,152
Numerical Methods and Computer Programs for Chemical Engineers, Selected* ---------- XVII,196
Numerical Methods and Modeling ---------- XVII,144
Numerical Methods and Modeling for ChE's* ---------- XX,150

O

Optimization, Engineering: Methods and Applications* ---------- XVIII,159
Optimization and Industrial Experimentation* ---------- XVI,167
Orthogonal Collocation, Simulation and Estimation by ---------- XVIII,204
Oscillating Sink, The ---------- XVI,110
Oxidative Dehydrogenation Over Ferrite Catalysts ---------- XVI,148

P

Participants or Victims?, Are We ---------- XIX,120
Petroleum Production, Fundamentals of ---------- XVI,164
Phase Diagrams, The Use of Computer Graphics to Teach Thermodynamic ---------- XIX,78
Phase Diagrams for Binary Mixtures, Computer-Generated ------ XVII,112
Phase Equilibria, Estimation of Fluid Properties and ---------- XIX,148
Phase Equilibria in Chemical Engineering* ---------- XX,35
Phase Equilibria Using Computer Graphics, The Representation of Highly Non-Ideal ---------- XX,88
Phase Rule, Extended Form of the Gibbs ---------- XIX,40
Photovoltaic Unit Operations, Semiconductor Chemical Reactor Engineering and ---------- XIX,72
Plant Design, Graduate ---------- XVIII,164
Plant Design and Economics for ChE's* ---------- XVI,205
Plant Design Course, Goals of an Undergraduate ---------- XVI,26
Plant Operations, Industrial Hygiene Aspects of* ---------- XIX,83
Plasma Processing in Integrated Circuit Fabrication ---------- XVII,148
Pneumatic and Hydraulic Conveying of Solids* ---------- XVIII,185
Polymers, Engineering With* ---------- XIX,25
Polymer Education and Research ---------- XVI,174
Polymer Processing ---------- XIX,190
Polymerization Engineering, Principles of* ---------- XVIII,73
Polynomial Approximation, Solution of Differential Equation Models By* ---------- XVI,43
Powders and Porous Materials, Characterization of ---------- XX,198

PROBLEMS

Dolphin Problem, The ---------- XVI,24
Ice Rink Problem, The ---------- XVI,94
Melting Ice Cube Problem ---------- XVI,114
Mine-Mouth Geyser Problem ---------- XVI,186

***Book Review**

One Month Problem: An Exercise in Modeling ---------- XIX,140
Ripple in a Falling Film ---------- XX,48
Setting the Pressure at Which to Conduct a Distillation ------ XVIII,38
Thermal Conductivity of a Hotdog ---------- XVIII,110
Wine Problem, A ---------- XVIII,70
Problem Solving to Use in the Classroom, Putting ---------- XVII,134
Process Control, A Microcomputer Based Laboratory for Teaching Computer ---------- XVIII,136
Process Control, A Useful Formula in ---------- XX,82
Process Control, Advanced* ---------- XVII,27
Process Control, Digital Computer Application in ---------- XVI,118
Process Control, Input Multiplicities in ---------- XVII,58
Process Control, Undergraduate ---------- XX,74
Process Control Courses, Discrete Processes in Undergraduate ---- XX,78
Process Control Education, Use of IBM's Advanced Control System in Undergraduate ---------- XX,70
Process Control on Chemical Engineering Education and Research, Impact of Packaged Software for ---------- XIX,144
Process Control Undergraduate Option, A ---------- XVII,24
Process Design, The Teaching of ---------- XIX,121
Process Design Courses at Pennsylvania, The: Impact of Process Simulators ---------- XVIII,26
Process Design in Process Control Education ---------- XVIII,122
Process Design Sequence at Virginia Tech ---------- XVI,34
Process Economics, Introduction to* ---------- XIX,10
Process Laboratory, An Innovative ChE ---------- XIX,150
Process Synthesis, Chemical ---------- XVI,68,138
Processes, Fundamentals of Chemical ---------- XIX,156
Programmable Calculator, Distillation Calculations With a ------- XVII,86
Project Evaluation in the Chemical Process Industries ---------- XVII,162
Property Relation, The Fundamental ---------- XVII,119
Pulse Testing With a Microcomputer ---------- XVIII,78

Q

Quantum Mechanics, The Picture Book of* ---------- XX,127
Quiz, The Generic ---------- XIX,176

R

Reaction Engineering, R.H. Wilhelm's Influence on the Development of Chemical ---------- XVII,10
Reading Scientific Papers, Learning Through ---------- XX,102
Reactors From Laboratory Data, Design of Industrial Chemical* ---------- XVII,46
Recovery Processes, Separations and ---------- XIX,172
Recycle With Heating ---------- XIX,136
Reference States and Relative Values of Internal Energy, Enthalpy, and Entropy ---------- XVII,64
Refinery 5 (Lithograph) ---------- XVII,141
Regulatory Process into the Chemical Engineering Curriculum, Introducing the ---------- XVIII,30
Research is Engineering ---------- XVI,190
Research Landmarks for Chemical Engineers ---------- XX,168
Residual Functions and Fugacity ---------- XVII,124
Resource-Based Approach to ChE Education, A ---------- XIX,36

S

Safety Do We Need in ChE Education?,How Much ---------- XVIII,82
Safety Program at Delaware, A Laboratory ---------- XX,144
San Diego, Cleaning Up in ---------- XVII,170
Scaleup of Chemical Processes* ---------- XX,135
Self-Study Examples, Use of Slides and ---------- XVII,105
Semiconductor Chemical Reactor Engineering and Photovoltaic Unit Operations ---------- XIX,72
Semiconductor Processing ---------- XVIII,200
Separations and Recovery Processes ---------- XIX,172
Separations Research ---------- XVIII,190
Sequential Design Laboratory Experiment for Separating Particles by Fluidization Principles, A ---------- XIX,30
Simulation and Estimation by Orthogonal Collocation ---------- XVIII,204
Simulation and Modelling at Royal Military College, Teaching -- XVIII,60
Simulation of the Manufacture of a Chemical Product in a Competitive Environment ---------- XVI,76
Slides and Self-Study Examples, Use of ---------- XVII,105
Socio-Humanistic Concepts into Engineering Courses, The Infusion of ---------- XVII,74
Software for Process Control on ChE Education and Research, Impact of Packaged ---------- XIX,144
Solar Hot Water Heating by Natural Convection ---------- XVII,20
Solids, Tray Drying of ---------- XVIII,132
Spatial Averaging Theorem, A Simple Geometrical Derivation of the ---------- XIX,18
Spreadsheets for Teaching Design, Using ---------- XX,128
Staged Operations, Improvements in the Teaching of ---------- XIX,132
Staged Operations, The Integration of Energy Conservation Principles into a Course on ---------- XVI,88
Steady-State Multiplicity Features of Chemically Reacting Systems - XX,12

STIRRED POTS

Lacey Lecturer: Hanratty, Tom ---------- XX,77
Lacey Lecturer: Luss, Dan ---------- XVII,97
Limerick Metric Applied to Thermodynamics ---------- XVIII,19
Mass Transfer Talkin' Blues ---------- XVIII,91
Weikart, Ballad of Jack ---------- XVII,53
Stirred Vessel, Laboratory Experiment for the Transient Response of a ---------- XVII,70
Summer School '87 ---------- XX,177
Surface Phenomena ---------- XVII,166
Surface Science, Colloid and ---------- XVIII,166
Survey, 1981 AIChE-EPC ---------- XVI,182
Symposium on Undergraduate ChE Thermodynamics ---------- XVII,104

T

Tensorial Nature of Fluxes in Continuous Media ---------- XVI,82
Ternary Phase Diagram for VLLE, Generation of a ---------- XX,94
Thermal Conductivity of a Hotdog ---------- XVIII,110
Thermodynamic Fundamentals of Exergy, The ---------- XVIII,116
Thermodynamics, An Integrated Approach to Teaching Undergraduate ---------- XVII,109
Thermodynamics, Chemical and Process* ---------- XVIII,139
Thermodynamics, Chemical Engineering* ---------- XX,21
Thermodynamics, Classical Solution ---------- XIX,62
Thermodynamics Instruction, Symposium on Undergraduate ChE ---------- XVII,104
Thermodynamics of Running ---------- XVI,18
Thermodynamics With Design Problems ---------- XVII,110
Third World, ChE Education in the: Two Views ---------- XVII,78
Time Series to Chemical Engineers, Teaching ---------- XIX,186
Transient Response of a Stirred Vessel, Laboratory Experiment for the ---------- XVII,70
Transport Phenomena ---------- XVIII,170
Transport Phenomena in Liquid Extraction* ---------- XVI,93
Tray Drying of Solids ---------- XVIII,132
Tubular Reactor Experiment, An Improved Design of a Simple --- XIX,84
TUTCHE—A Program Package for Tutoring ChE's ---------- XVII,34
Tutor, The Chemistry* ---------- XX,43
TV Taped Problems, Supplemental ---------- XVII,117

U

Unit Operations, Semiconductor Chemical Reactor Engineering and Photovoltaic ---------- XIX,72

V

Vapour Compression, Distillation With ---------- XX,132
Video-Based Seminars, Heterogeneous Catalysis Involving ----- XVIII,174

W

Wilhelm's Influence on the Development of Chemical Reaction Engineering, R.H. ---------- XVII,10
Wine Problem, A ---------- XVIII,70

Y

Yale, Two Gentlemen From ---------- XVI,107

***Book Review**