

BIBLIOGRAPHY

1. Agrawal, Pradeep K., Katzer, James R. and Manogue, William, H., Ind. Eng. Chem. Fundam., **21**, 385 (1982).
2. Ahmad, Adnan and Wojciechowski, Bohdan W., Can. J. Chem. Eng., **62**, 382 (1984).
3. Allyn, C. L., Gustaffson, T. and Plummer, E. W., Chem. Phys. Lett., **47**, 127 (1977).
4. Anderson, Robert B., Hall, W. Keith and Hofer, L. J. E., J. Am. Chem. Soc., **70**, 2465 (1948).
5. Anderson, Robert B., Krieg, Abraham, Friedel, R. A. and Mason, L. S., Ind. Eng. Chem., **41:10**, 2189 (1949).
6. Anderson, Robert B., Catalysis, Vol. IV, Emmett, Paul H. (ed.), Reinhold, New York, New York (1956).
7. Anderson, Robert B., Lee, Chung-Boon and Machiels, Joseph, C., Can. J. Chem. Eng., **54**, 590 (1976).
8. Anderson, Robert B., The Fischer-Tropsch Synthesis, Academic, Orlando, Florida (1984).
9. Arizona State University, Biomass Conversion Project, ASU Biomass Conversion Laboratory Instruction and Safety Manual, Chem. Eng. Dept., Arizona State Univ., Tempe, AZ (1983).
10. Baetzold, R. C., J. Phys. Chem., **88**, 5583 (1984).
11. Balkier, A., International Chem. Eng., **25:1**, 16 (1985).
12. Balooch, M., Cardillo, M. J., Miller, D. R. and Stickney, R. E.,

- Surf. Sci., 46, 358 (1974).
13. Balzhiser, Richard E., Samuels, Michael R. and Ellassen, John D., Chemical Engineering Thermodynamics, Prentice-Hall, Englewood Cliffs, New Jersey (1972).
 14. Band, E. and Muetterties, E. L., Chem. Rev., 78, 639 (1978).
 15. Bartholomew, C. H. and Pannell, R. B., J. Catal., 65, 390 (1980).
 16. Bartholomew, Calvin H. and Reuel, Robert C., Ind. Eng. Chem., Prod. Res. Dev., 24, 56 (1985).
 17. Batra, I. P. and Robaux, O., J. Vac. Sci. Tech., 12, 242 (1975).
 18. Bell, Alexis T., Catal. Rev.-Sci. Eng., 23, 203 (1981).
 19. Bell, Alexis T., Heterog. Catal. Proc. Symp. Ind.-Univ. Coop. Chem. Prog., Dept. Chem., Texas A&M Univ. (1984).
 20. Benziger, J. and Madix, R. J., Surf. Sci., 94, 119 (1980).
 21. Billoen, P., Helle, J. N. and Sachtler, W. M. H., J. Catal., 58, 95 (1979).
 22. Billoen, P., Recueil, J. Roy. Netherland Chem. Soc., 99, 34 (1980).
 23. Billoen, P. and Sachtler, W. M. H., Adv. in Catal., 30, 165 (1981).
 24. Billoen, P., Helle, J. N., van den Berg, F. G. A., and Sachtler, W. M. H., J. Catal., 81, 450 (1983).
 25. Bird, R. Byron, Stewart, Warren E. and Lightfoot, Edwin N., Transport Phenomena, John Wiley, New York, NY (1960).
 26. Blyholder, George, J. Phys. Chem., 68, 2772 (1964).

27. Blyholder, G. and Neff, L. D.,
J. Phys. Chem., 70, 893 (1966).
28. Blyholder, G. and Neff, Laurence D.,
J. Phys. Chem., 70, 1738 (1966).
29. Blyholder, G. and Wyatt, William V.,
J. Phys. Chem., 70, 1745 (1966).
30. Blyholder, G. and Sheets, R.,
J. Phys. Chem., 74, 4335 (1970).
31. Blyholder, G.,
J. Vac. Sci. Tech., 11, 865 (1974).
32. Boudart, M., Vannice, M. A. and Benson, J. E. Z.,
Z. Phys. Chem. (Wiesbaden) 64, 171 (1969).
33. Boudart, M.,
AIChE J., 18, 465 (1972).
34. Boudart, Michel and Djega-Mariadassou, G.,
Kinetics of Heterogeneous Catalytic Reactions,
Princeton Univ., Princeton, New Jersey (1984).
35. Boudart, M. and McDonald, Mark A.,
J. Phys. Chem., 88:11, 2185 (1984).
36. Box, G. E. P., Hunter, W. G. and Hunter, J. S.,
Statistics for Experimenters: An Introduction to Design, Data Analysis and Model Building, John Wiley, New York, NY (1978).
37. Bozso, F., Ertl, G., Grunze, M. and Weiss, M.,
J. Catal., 49, 18 (1977).
38. Bozso, F., Ertl, G. and Weiss, M.,
J. Catal., 50, 519 (1977).
39. Brady, III, Robert C. and Pettit, R.,
J. Am. Chem. Soc., 102, 6181 (1980).
40. Brady, III, Robert C. and Pettit, R.,
J. Am. Chem. Soc., 103, 1287 (1981).
41. Bridge, M. E., Comrie, C. M. and Lambert, R. M.,
Surf. Sci., 67, 393 (1977).
42. Bridge, M. E., Comrie, C. M. and Lambert, R. M.,
J. Catal., 58, 28 (1979).

43. Broden, G., Rhodin, T. N., Brucker, C., Benbow, R. and Hurrych, Z., Surf. Sci., 59, 593 (1976).
44. Butt, John B. and Weekman, Jr., Vern W., AIChE Symp. Ser., 143:70, 27 (1974).
45. Campbell, II, Charles N., Synthesis of Liquid Hydrocarbon Fuels from Biomass Pyrolysis Gas in a Slurry Reactor, M.S. Thesis, Arizona State Univ., Tempe, AZ (1983).
46. Carberry, J. J., Ind. Eng. Chem., 56:11, 39 (1964).
47. Carberry, James J., Chemical and Catalytic Reaction Engineering, McGraw-Hill, New York, NY (1976).
48. Carle Instruments, Inc., Instruction Manual for Analytical Gas Chromatographs, Models 111, 211 and 311, Anaheim, Calif. (1977).
49. Carr, R. G., Sham, T. K. and Eberhardt, W. E., Chem. Phys. Lett., 113:1, 63 (1985).
50. Chin, Roland L. and Hercules, David M., J. Phys. Chem., 86, 360 (1982).
51. Choi, J.-G., Rhee, H.-K. and Moon, S. H., Appl. Catal., 13, 269 (1985).
52. Christmann, K., Schober, O., Ertl, G. and Neumann, M., J. Chem. Phys., 60, 4528 (1974).
53. Christmann, K., Ertl, G. and Pignet, T., Surf. Sci., 54, 365 (1976).
54. Christmann, K., Behm, R. J., Ertl, G., van Hove, M. A. and Weinberg, W. H., J. Chem. Phys., 70, 4168 (1979).
55. Christoffel, Erhard G., Catal. Rev.-Sci. Eng., 24:2, 159 (1982).
56. Chung, Cheng-Wen, Catalytic Reforming of Paraffinic Fuel from Biomass Conversion, M.S. Thesis, Arizona State Univ., Tempe, AZ (1979).

57. Conrad, H., Ertl, G. and Latta, E. E.,
Surf. Sci., 41, 435 (1974).
58. Conrad, H., Ertl, G., Kuppers, J. and Latta, E. E.,
Surf. Sci., 58, 578 (1976).
59. Conrad, H., Ertl, G., Knozinger, H., Kuppers,
J. and Latta, E. L.,
Chem. Phys. Lett., 42, 115 (1976).
60. Cortes, Joaquin and Drogue, Sergio,
J. Catal., 38, 477 (1975).
61. Cotton, F. Albert and Wilkinson, Geoffrey F. R. S.,
Advanced Inorganic Chemistry, 3rd ed.,
Interscience, New York, NY (1972).
62. Craxford, S. R. and Rideal, E. K.,
J. Chem. Soc., Pt. 2, 1604 (1939).
63. Crossley, Alison and King, David A.,
Surf. Sci., 68, 528 (1977).
64. Csizmadia, I. G.,
Quantum Theory of Chemical Reactions, Vol. III, 77,
Daudel, R., Pullman, A., Salem, L. and Viellard, A.
(eds.), Reidel (1982).
65. Cukr, M., Merta, R., Adamek, J. and Ponec, V.,
Collect. Czech. Chem. Commun., 30, 2682 (1965).
66. Cullity, B. D.,
Elements of X-Ray Diffraction, 2nd ed., Addison-Wesley, Reading, Mass. (1978).
67. Cusumano, J. A.,
Catalysis in Coal Conversion, Academic, Orlando, Florida (1978).
68. Cvetanovic, R. J. and Amenomiya, Y.,
Catal. Rev., 6, 21 (1972).
69. Dadyburjor, Dady B.,
J. Catal., 82, 489 (1983).
70. Delannay, Francis (ed.),
Characterization of Heterogeneous Catalysts, Marcel Dekker, New York, NY (1984).
71. Dictor, Ronald A. and Bell, Alexis T.,
Ind. Eng. Chem. Proc. Des. Dev., 22, 678 (1983).

72. Doraiswamy, L. K. and Tajbi, D. G.,
Catal. Rev., 10, 177 (1975).
73. Dowden, D. A. and Bridger, G. W.,
Adv. Catal., 9, 669 (1957).
74. Dry, Mark E.,
Ind. Eng. Chem., Prod. Res. Dev., 15, 282 (1976).
75. Dry, M. E. and Hoogendoorn, J. C.,
Catal. Rev.-Sci. Eng., 23, 265 (1981).
76. Dry, M. E.,
Catalysis. Science & Technology, Vol. 1, Ch. 4,
Anderson, J. R. and Boudart, M. (eds.), Springer-
Verlag, Berlin (1981).
77. Dry, M. E.,
Hydrocarbon Process, 61, 121 (1982).
78. Eckerdt, John G. and Bell, Alexis T.,
J. Catal., 62, 19 (1980).
79. Eidus, Ya. T.,
Russ. Chem. Rev., 36:5, 338 (1967).
80. Ekstrom, A. and Lapszewicz, J.,
J. Phys. Chem., 88, 4577 (1984).
81. Eley, D. D. and Rideal, E. K.,
Proc. R. Soc., London, Ser. A., 178, 429 (1941).
82. Eley, D. D. and Rideal, E. K.,
Proc. R. Soc., London, Ser. A., 178, 452 (1941).
83. Engel, T. and Ertl, G.,
Adv. Catal., 28, 1 (1979).
84. Ezzo, E. M., Ebaid, Fikry M., Yousef, N. A.
and Elalashy, M. K.,
Surf. Techn., 19, 35 (1983).
85. Farah, Oscar G., Ouellette, Robert P., Kuehnel,
Ralph C., Maradaz, Mario A. and Cheremisinoff, Paul
N.,
Ethylene-Basic Chemicals Feed Stock Materials, Ann
Arbor, Ann Arbor, Mich. (1980).
86. Farrauto, Robert J.,
AIChE Symp. Ser., 143:70, 9 (1974).

87. Fleming, Wayne C.,
Conversion of Pyrolysis Gases to Liquid Fuels, M.S.
Thesis, Arizona State Univ., Tempe, AZ (1976).
88. Foxboro Company,
Instruction Manual for Installation, Operation and
Maintenance of Current-to-Air Transducer, Model
69TA-2R, Book No. 1780, Foxboro, MA (1969).
89. Frohning, C. D.,
New Synthesis with Carbon Monoxide, Ch. 4, Falbe, J.
(ed.), Springer-Verlag, Berlin (1980).
90. Frohning, C. D., Kolbel, H., Ralek, M., Rottig, W.,
Schnur, F. and Schultz, H.,
Chemical Feed Stocks from Coal, Falbe, J. (ed.),
Wiley, New York, New York (1982).
91. Froment, G. F.,
AIChE J., 21, 104 (1975).
92. Froment, Gilbert F. and Bischoff, Kenneth B.,
Chemical Reactor Analysis and Design, John Wiley,
New York, NY (1979).
93. Froment, G. F. and Hosten, L. H.,
Catalysis. Science & Technology, Vol. 2, Ch. 3,
Anderson, John R. and Boudart, Michel (eds.),
Springer-Verlag, Berlin (1981).
94. Fu, Liu and Bartholomew, Calvin H.,
J. Catal., 92, 376 (1985).
95. Galwey, A. K.,
J. Catal., 1, 227 (1962).
96. Geusic, M. E., Morse, M. D. and Smalley, R. E.,
J. Chem. Phys., Commun., 82:1, 590 (1985).
97. Gibson, E. J. and Hall, C. C.,
J. Appl. Chem., 4, 464 (1954).
98. Gonzalez, Richard D.,
Appl. Surf. Sci., 19, 181 (1984).
99. Goodman, D. Wayne, Madey, Theodore E., Ono, Masatoshi
and Yates, Jr., John T.,
J. Catal., 50, 279 (1977).
100. Goodman, D. Wayne, Yates, Jr., John T. and Madey,
Theodore E.,

- Surf. Sci., 93, L135 (1980).
101. Gopalakrishnan, R. and Viswanathan, B.,
J. Coll. Interface Sci., 102:2, 370 (1984).
 102. Gough, Robert W.,
Conversion of Cellulosic and Waste Polymer Material to Gasoline: Catalytic Reforming, M.S. Thesis,
Arizona State Univ., Tempe, AZ (1978).
 103. Graham, R. G., Bergougnou, M. A. and Ocerend, R. P.,
J. Anal. Pyrolysis, 6, 95 (1984).
 104. Gupta, R. Balaji, Viswanathan, B. and Sastri, M. V. C.,
J. Catal., 26, 212 (1972).
 105. Hackenbruch, Joachim, Keim, Wilhelm, Roper, Michael and Strutz, Heinz,
J. Mol. Catal., 26, 129 (1984).
 106. Hall, W. K., Kokes, R. J. and Emmett, P. H.,
J. Am. Chem. Soc., 82, 1027 (1960).
 107. Henrici-Olive, G. and Olive, S.,
Angew. Chem. Int. Ed., Eng., 15, 136 (1976).
 108. Henrici-Olive, G. and Olive, S.,
J. Mol. Catal., 16, 187 (1982).
 109. Henrici-Olive, G. and Olive, S.,
J. Mol. Catal., 18, 367 (1983).
 110. Henrici-Olive, G. and Olive, S.,
The Chemistry of the Catalyzed Hydrogenation of Carbon Monoxide, Springer-Verlag, Berlin (1984).
 111. Henrici-Olive, G. and Olive, S.,
J. Mol. Catal., 24, 7 (1984).
 112. Herrmann, Wolfgang A.,
Angew. Chem. Int. Ed., Engl., 21, 117 (1982).
 113. Hewlett-Packard Company,
Instruction Manual for Gas Chromatographs, Series 5710A/30A, Avondale, PA (1978).
 114. Hindermann, J. P., Deluzarche, A., Kleffer, R. and Kienemann, A.,
Can. J. Chem. Eng., 61, 21 (1983).

115. Hojlund-Nielsen, P. E. and Bogild-Hansen, J.,
J. Mol. Catal., 17, 183 (1982).
116. Hougen, O. A. and Watson, K. M.,
Ind. Eng. Chem., 35, 529 (1943).
117. Hougen, Olaf A. and Watson, Kenneth M.,
Chemical Process Principles, Part III, John Wiley,
New York, NY (1959).
118. Hsu, Louis Lu-Chen,
Design of a Dual Fluidized Bed System for Thermal Gasification, M.S. Thesis, Arizona State Univ.,
Tempe, AZ (1979).
119. Hughes, Thomas R., Houston, Robert J. and Sieg,
Robert P.,
Ind. Eng. Chem. (Process Design), 1, 96 (1962).
120. Hulbert, H. H. and Srinivasan, C. D.,
AIChE J., 7, 143 (1961).
121. Hunter, Michael G.,
Rate Equation Modelling for a Gasoline Synthesis Reactor, Senior Research Project, Arizona State Univ., Tempe, AZ (1976).
122. Hunter, Michael Glen,
Dual Fluidized Bed Pyrolysis of Biomass: Steam, Catalyst and Feedstock Effects, M.S. Thesis,
Arizona State Univ., Tempe, AZ (1980).
123. Ibbotson, D. E., Wittig, T. S. and Weinberg,
W. H.,
J. Chem. Phys., 72, 4885 (1980).
124. Ikariya, Takao and Yamamoto, Akio,
J. Chem. Soc., Chem. Commun., 720 (1974).
125. ISML Inc.,
The ISML Library, 9th ed., Houston, TX (1982).
126. Jacobs, Peter A. and Van Wouwe, Dirk,
J. Mol. Catal., 17, 145 (1982).
127. Joyner, Richard W.,
J. Catal., 50, 176 (1977).
128. Keely, W. M.,
Anal. Chem., 38:1, 147 (1966).

129. Kessler, Jorg and Thieme, Fritz,
Surf. Sci., 67, 405 (1977).
130. Khoobiar, S.,
J. Phys. Chem., 68, 411 (1964).
131. Klug, Harold P. and Alexander, Leroy E.,
X-Ray Diffraction Procedures, 2nd ed., John Wiley,
New York, NY (1974).
132. Kniel, Ludwig, Winter, Olef and Stork, Karl,
Ethylene, Keystone to the Petrochemical Industry,
Marcel Dekker, New York, NY (1980).
133. Koestner, R. J., Van Hove, M. A. and Somorjai,
G. A.,
J. Phys. Chem., 87:2, 203 (1983).
134. Kolbel, Herbert and Tillmetz, Klaus D.,
J. Catal., 34, 307 (1974).
135. Kroeker, R. M. and Pacansky, J.,
J. Chem. Phys., 76:6, 3291 (1982).
136. Kuester, James L.,
"An Indirect Liquefaction Process for Producing
Liquid Fuels from Biomass", presented at the
American Institute of Chemical Engineers Session on
Conversion of Biomass to Energy and High Value
Product, Portland, Oregon (1980).
137. Kuester, James L.,
Biomass as a Nonfossil Fuel Source, Ch. 8, Klass,
D. L. (ed.), ACS Symp. Series, 144, American
Chemical Society, Washington, D. C. (1980).
138. Kuester, James L.,
Conversion of Cellulosic Wastes to Liquid
Hydrocarbon Fuels, DOE Interim Report, Contract No.
DE-AC02-76CS40202 (1984).
139. Kummer, J. T., DeWitt, T. W. and Emmett, P. H.,
J. Am. Chem. Soc., 70, 3632 (1948).
140. Lee, B. S.,
AIChE Monograph Ser., 14, 78 (1982).
141. Lee, C. B., Calverley, E. M. and Anderson, R. B.,
J. Catal., 92, 180 (1985).
142. Lee, Hong H.,

- Heterogeneous Reactor Design, Butterworth,
Stoneham, MA (1985).
143. Lin, Kenneth C., Witt, J. D. and Hammaker, R. M.,
J. Chem. Phys., 55, 1148 (1971).
 144. Little, L. H.,
Infrared Spectra of Adsorbed Species, Academic, New
York, NY (1966).
 145. Lu, Danny C.,
Operation Instruction of the Adsorption System,
Progress Report, Biomass Conversion Project, Chem.
Eng. Dept., Arizona State Univ., Tempe, AZ (1983).
 146. Lu, Min-Jan,
A Study of Iron-based Catalysts for Conversion of
Biomass Derived Synthesis Gas to Liquid Fuels, M.S.
Thesis, Arizona State Univ., Tempe, AZ (1981).
 147. Lucchesi, P. J., Carter, J. L. and Sinfelt, J. H.,
J. Am. Chem. Soc., 86, 1494 (1964).
 148. Madix, R. J.,
Chemistry and Physics of Solid Surfaces, Vanselov,
R. (ed.), CRC, Boca Raton, Fla. (1979).
 149. Madix, R. J.,
"The Physics of Surface Aspects of the Kinetics and
Dynamics of Surface Reactions", Proceedings, A.I.P.
Conference, La Jolla Institute (1979).
 150. Madon, R. J.,
J. Catal., 57, 183 (1979).
 151. Marquardt, D. W.,
J. Soc. Ind. Appl. Math., No. 2, 431 (1963).
 152. McCandlish, L. E.,
J. Catal., 83, 362 (1983).
 153. McCarty, Jon, Falconer, John and Madix, Robert J.,
J. Catal., 30, 235 (1973).
 154. McCarty, J. G. and Wise, H.,
J. Catal., 51, 406 (1979).
 155. McKee, D. W.,
J. Catal., 8, 240 (1967).
 156. Mears, David E.,

- Ind. Eng. Chem., Proc. Des. Dev., 10:4, 541 (1971).
157. Melsel, S. L., McCullough, J. P., Lechthaler, C. H. and Weisz, P. B., CHEMTECH, 86 (1976).
158. Minot, Christian, Kahn, Olivier and Salem, Lionel, Surf. Sci., 94, 515 (1980).
159. MKS Instruments, Instruction Manual for 170M-34C Electronics, Burlington, MA (1979).
160. Moore, Walter J., Physical Chemistry, 4th ed., Prentice-Hall, Englewood Cliffs, NJ (1972).
161. Muettteries, E. L. and Stein, Judith, Chem. Rev., 79, 479 (1979).
162. Muller, Jaroslav, Rev. Pure and Appl. Chem., 19, 151 (1969).
163. Myddleton, W. W., J. Inst. Petrol., 30, 211 (1944).
164. Natta, G., Colombo, U. and Pasquon, I., Catalysis, Vol. V, Emmett, Paul H. (ed.), Reinhold, New York, NY (1957).
165. Nieuwenhuys, B. E., Surf. Sci., 105, 505 (1981).
166. Nijs, Hubert H. and Jacobs, Peter A., J. Catal., 66, 401 (1980).
167. Nijs, Hubert H. and Jacobs, Peter A., J. Catal., 65, 328 (1980).
168. Novak, S., Madon, R. J. and Suhl, H., J. Chem. Phys., 74:11, 6083 (1981).
169. Novak, S., Madon, R. J. and Suhl, H., J. Catal., 77, 141 (1982).
170. Novak, Stephanie and Madon, Rostam J., Ind. Eng. Chem., Fundam., 23, 274 (1984).
171. Otto, Kelvin C., Analysis of Gasoline Synthesis Product by Gas Chromatography, ERC-76022 Report, Biomass

- Conversion Project, Arizona State Univ., Tempe, AZ (1976).
172. Parkash, S.,
Can. J. Chem. Eng., 60, 23 (1982).
 173. Pichler, H. and Schulz, H.,
Chem.-Ing.-Tech., 42, 1162 (1970).
 174. Ponec, V.,
Catal. Rev.-Sci. Eng., 18, 151 (1978).
 175. Ponec, Vladimir and van Barneveld, Willem A.,
Ind. Eng. Chem., Prod. Res. Dev., 18:4, 268 (1979).
 176. Probstein, Ronald F. and Hicks, R. Edwin,
Synthetic Fuels, McGraw-Hill, New York, NY (1982).
 177. Raupp, G. B. and Delgass, W. N.,
J. Catal., 58, 361 (1979).
 178. Rautavaoma, A. Outi I. and van der Baan, Hessel S.,
Appl. Catal., 1, 247 (1981).
 179. Rautavaoma, A. Outi I. and van der Baan, Hessel S.,
J. Catal., 71, 423 (1981).
 180. Reid, Robert C., Prausnitz, John M. and Sherwood, Thomas K.,
The Properties of Gases and Liquids, 3rd ed., McGraw-Hill, New York, NY (1977).
 181. Reuel, Robert C. and Bartholomew, Calvin H.,
J. Catal., 85, 63 (1984).
 182. Reuel, Robert C. and Bartholomew, Calvin H.,
J. Catal., 85, 78 (1984).
 183. Rofer-DePoorter, Cheryl K.,
Chem. Rev., 81, 447 (1981).
 184. Rollin, A., Richard, C., Masson, D. and
Deglise, X.,
J. Anal. Appl. Pyroly., 5, 151 (1983).
 185. Roper, M.,
Catalysis in Cl Chemistry, Keim, Wilhelm (ed.), D. Reidel, Dordrecht, Holland (1983).
 186. Sabin, Edwin Wallace,
Temperature and Feed Rate Effects of Cellulose

- Pyrolysis in a Dual Fluidized Bed, M.S. Thesis,
Arizona State Univ., Tempe, AZ (1979).
187. SAS Institute, Inc.,
SAS User's Guide: Statistics, Cary, NC (1982).
188. Sastri, M. V. C., Gupta, R. Balaji and Viswanathan,
B.,
J. Catal., 32, 325 (1974).
189. Satterfield, Charles N.,
Mass Transfer in Heterogeneous Catalysis, M.I.T.,
Cambridge, Mass. (1970).
190. Satterfield, Charles N. and Cortez, Douglas H.,
Ind. Eng. Chem. Fundam., 9, 613 (1970).
191. Satterfield, Charles N.,
Heterogeneous Catalysis in Practice, McGraw-Hill,
New York, NY (1980).
192. Satterfield, Charles N., Huff, George A. and
Summerhayes, Robert,
J. Catal., 80, 486 (1983).
193. Schulz, H. and ElDeen, A. Z.,
Fuel Proc. Tech., 1 31 (1977).
194. Scott, Lee C.,
Dual Fluidized Bed Pyrolysis of Biomass: Temperature and Feedstock Effects, M.S. Thesis,
Arizona State Univ., Tempe, AZ (1982).
195. Seyferth, Dietmar,
Adv. Organomet., 14, 97 (1976).
196. Shariat, Ali Reza,
Catalytic Pyrolysis of Biomass In a Fluidized Bed Reactor, M.S. Thesis, Arizona State Univ., Tempe,
AZ (1984).
197. Sheldon, Roger A.,
Chemicals from Synthesis Gas, D. Reidel,
Dordrecht, Holland (1983).
198. Shustorovich, Evgeny, Baetzold, Roger C. and
Muettterties, E. L.,
J. Phys. Chem., 87, 1100 (1983).
199. Sinfelt, J. H. and Lucchsi, P. J.,
J. Am. Chem. Soc., 85, 3365 (1963).

200. Sinfelt, J. H., Taylor, W. F. and Yates, D. J. C.,
J. Phys. Chem., 69, 95 (1965).
201. Smith, David. F.,
Ind. Eng. Chem., 19, 801 (1927).
202. Solar Energy Research Institute,
A Survey of Biomass Gasification, Vol. I-III,
Report No. SERI/7R-33-239, Golden, Colorado (1980).
203. Somorjai, G. A.,
Catal. Rev., 23:1&2, 189 (1981).
204. Spectra-Physics,
Operators Manual for Computing Integrator, (SP4270),
San Jose, CA (1982).
205. Spectra-Physics,
Instruction Manual for Computing Integrator System
1, Part No. 21941-020, Santa Clara, CA (1979).
206. Storch, Henry H., Golumbic, Norma and Anderson,
Robert B.,
The Fischer-Tropsch and Related Syntheses, John
Wiley, New York, NY (1951).
207. Sung, Shen-Shu and Hoffmann, Roald,
J. Am. Chem., 107:3, 579 (1985).
208. Takeuchi, Atsushi and Katzer, James R.,
J. Phys. Chem., 86, 2438 (1982).
209. Tamm, P. W. and Schmidt, L. D.,
J. Chem. Phys., 51, 5352 (1969).
210. Tanaka, Ken-Ichi, Yaegashi, Isamu and Aomura,
Kazuo,
J. Chem. Soc., Chem. Commun., 938 (1982).
211. Tanaka, Ken-Ichi, Nakagawa, Tomoyuki, Yaegashi,
Isamu and Aomura, Kazu,
J. Mol. Catal., 28, 239 (1985).
212. Taylor, P. D. and Wojciechowsk, B. W.,
Can. J. Chem. Eng., 61, 98 (1983).
213. Techne Incorporated,
Operating Instructions for Fluidised Bath, Model
SBS-4, Princeton, NJ (1978).
214. Texas A&M Univ., Thermodynamics Research Center,

Selected Values of Properties of Hydrocarbons and Related Compounds, Vol. V, The American Petroleum Institute, Research Project 44 (1975).

215. Thomas, G. E. and Weinberg, W. H.,
J. Chem. Phys., 70, 954 (1979).
216. Thomas, G. E. and Weinberg, W. H.,
J. Chem. Phys., 70, 1437 (1979).
217. Thomson, W. J., Arndt, J. M. and Wright, K. L.,
Prepr. Fuel Chem. Div., Am. Chem. Soc., 25, 101 (1980).
218. Ugo, R.,
Catal. Rev.-Sci. Eng., 11, 225 (1975).
219. United Electric Controls Company,
Installation and Maintenance Instructions for Single Output Controllers, Types C921/D921, Watertown, Mass. (1980).
220. van Barneveld, W. A. A. and Ponec, V.,
J. Catal., 51, 426 (1978).
221. Vannice, M. A.,
J. Catal., 37, 449 (1975).
222. Vannice, M. A.,
J. Catal., 37, 462 (1975).
223. Vannice, M. A.,
Catal. Rev.-Sci. Eng., 14:2, 153 (1976).
224. Varian Industrial Products,
Operating Instructions for Ratlomatic Ionization Gauge Control (Model 842/843), Lexington, Mass. (1975).
225. Varian Industrial Products,
Installation, Operation, and Maintenance Instructions for Diffusion Pumps Series M Sizes: 2", 4" and 6", Lexington, Mass. (1976).
226. Varian Industrial Products,
Installation, Operating and Maintenance Manual for M-4 Pumping Stack, Lexington, Mass. (1981).
227. Wang, Ta-ching,
Synthesis of Liquid Hydrocarbon Fuels from Biomass Pyrolysis Gas, M.S. Thesis, Arizona State Univ.,

- Tempe, AZ (1980).
228. Wedler, G., Papp, H. and Schroll, G.,
J. Catal., 38, 153 (1975).
 229. Wedler, G., Geuss, K.-P., Colb, K. G.
and McElhiney, G.,
Appl. Surf. Sci., 1, 471 (1978).
 230. Wedler, G., Colb, K. G., Heinrich, W.
and McElhiney, G.,
Appl. Surf. Sci., 2, 85 (1978).
 231. Weekman, Jr., Vern W.,
AIChE J., 20:5, 833 (1974).
 232. Weekman, Jr., Vern W.,
AIChE Monograph Ser., 75:11, American Institute of
Chemical Engineers, New York, NY (1979).
 233. Weller, S. W.,
Adv. Chem. Ser., 148, 26 (1975).
 234. Wender, Irving, Sternberg, H. W. and Orchin,
Milton,
Catalysis, Vol. V, Ch. 2, Emmett, Paul H. (ed.),
Reinhold, New York, NY (1957).
 235. Westinghouse Electric Corp.,
Instruction Manual for Compact Control Stations,
Model 5500 Series, I.B-101-540, Phoenix, AZ (1974).
 236. Westinghouse Electric Corp.,
Instructions Bulletin for Gauge Pressure
Transmitter, Model 75PGI, I.B. 100-114, Phoenix, AZ
(1976).
 237. White, John M.,
J. Phys. Chem., 87:6, 915 (1983).
 238. Wicke, E.,
Chem.-Ing.-Tech., 29, 305 (1957).
 239. Wise, Donald L. (ed.),
Organic Chemicals from Biomass, Benjamin/Cummings,
Menlo Park, CA. (1983).
 240. Yamamoto, T.,
J. Chem. Soc., Chem. Commun., 1003 (1978).
 241. Yang, Chen-Hsyong, Massoth, F. E. and Oblad, A. G.,

- Adv. Chem. Ser., 178, 35 (1979).
242. Yates, Ann,
Instructions for Diffractometer, Chem. Dept.,
Arizona State Univ., Tempe, AZ (1981).
243. Yates, Ann,
Operating Instructions for Philips XRF PW/1410,
Chem. Dept., Arizona State Univ., Temp, AZ (1981).
244. Yates, D. J. C., Sinfelt, J. H. and Taylor, W. F.,
Trans. Faraday Soc., 61, 2044 (1965).
245. Yates, Jr., John T. and Madey, Theodore E.,
Surf. Sci., 28, 438 (1971).
246. Yates, Jr., J. T., Duncan, T. M., Worley, S. D.
and Vaughan, R. W.,
J. Chem. Phys., 70, 1219 (1979).
247. Yates, Jr., J. T., Thiel, P. A. and Weinberg,
W. H.,
Surf. Sci., 84, 427 (1979).
248. Yokogawa Electric Works,
Instruction Manual for Hybrid Recorder (ER250, Model
4088), Tokyo, Japan (1980).
249. Zimmerman, William H.,
Slurry Phase Synthesis of liquid Hydrocarbon Fuels
from Biomass Pyrolysis Gas Using Iron Catalysts,
M.S. Thesis, Arizona State Univ., Tempe, AZ (1985)
250. Zowitlak, John M. and Bartholomew, Calvin H.,
J. Catal., 83, 107 (1983).