

SECTION V - REFERENCES

- Amundson, N.R. and L.E. Arri, *AIChE J.*, **24**, 87, (1978).
- Bautista, J.R., Russel, W.B., and Saville, D.A., *Ind. Eng. Chem. Fundam.* **25**, 536, (1985).
- Bhattacharya, A., L. Salam, M.P. Dudukovic, and B. Joseph, *Ind. Eng. Chem. Proc. Des. Dev.*, **25**, 988, (1986).
- Bilger, R.W., *Comb. Sci. Tech.*, **19**, 89, (1979).
- Bilger, R.W., *Comb. Sci. Tech.*, **22**, 251, (1980).
- Bilger, R.W., *Comb. & Flame*, **30**, 277, (1978).
- Bischoff, K.B., *Chem. Eng. Sci.*, **24**, 607, (1969).
- Bishop, M. and Ward, D.L., *Fuel*, **37**, 191, (1958).
- Brewster, B.S., Baxter, L.L. and Smoot, L.D., "The Treatment of Coal Devolatilization in Comprehensive Combustion Modeling," *Energy & Fuels*, accepted for publication, (1988).
- Categen, B.M., Johnson, T.R., Payne, R., Moyeda, D.K., Sheldon, M.S., Li, W. and Kindt, G.S., "Effective Mixing Processes for SO_x, Sorbent, and Coal Combustion Products," Final Report prepared for the Environmental Protection Agency, Contract No. 68-02-4205 (May 1987).
- Chiou, M.J. and Levine, H.B., "Investigation of Structure Deformation of Coal Particles in Pyrolysis", *Jaycor*, (1978).
- Cho, Y.S., "Modeling and Simulation of Lurgi-Type Gasifier," M.S. Thesis, Washington University, St. Louis, MO, (1980).
- Colson, R., M.S. Thesis (in progress), Department of Chemical Engineering, Brigham Young University, Provo, UT (1988).
- Correa, S.M., Drake, M.C. Pitz, R.W. and W. Shyy, 20th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 337, (1984).
- Denn, M., Wei, J., Yu, W.-C. and Cwiklinski, R., "Detailed Simulation of a Moving Bed Gasifier," AP-2576, EPRI, Palo Alto, CA (1982).
- DeWasch, A.P. and Froment, G.F. *Chem. Eng. Sci.*, **26**, 629, (1971).
- Drake, M.C., Correa, S.M., Pitz, R.W., Shyy, W., and Fenimore, C.P., *Comb. & Flame*, **69**, 347 (1987).
- Drake, M.C., Pitz, R.W., Correa, S.M., and Lapp, M., 20th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, (1984).
- Ergun, S., *Chem. Eng. Prog.*, **48**, 89, (1952).
- Fenimore, C.P., and Fraenkel, H.A., 18th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 143, (1981).

- Flaxman, R.J., and Hallett, W.L. "A Study of Flow and Particle Heating in a Drop Tube Furnace," Final Report prepared for Energy, Mines, and Resources Canada, DSS Contract No. 1SU83-00105 (March, 1986).
- Fong, W.S., "Plasticity and Agglomeration in Coal Pyrolysis", Ph.D. Dissertation, MIT, (1986).
- Franklin, H.D., "Mineral Matter Effects in Coal Pyrolysis and Hydropyrolysis", Ph.D. Thesis, Dept. of Chem. Engineering, Massachusetts Institute of Technology, Cambridge, MA, (1980).
- Froment, G.F. and Bischoff, K.B., Chemical Reactor Analysis and Design, John Wiley, NY, (1979).
- Gavalas, G.R. and Wilks, K.A., *AIChE J.*, **26**, 577, (1980).
- Gear, C.W., Numerical Initial-Value Problems in Ordinary Differential Equations, Prentice-Hall, Englewood Cliffs, NJ, (1971).
- Gerstein, B., Murphy, P.D. and Ryan, L.M., Coal Structure, (R.A. Meyers, Ed.) Chapter 4, Academic Press, New York (1982).
- Gibbins-Matham, J. and Kandiyoti, R., *Energy and Fuel*, **2**, (4), 505, (1988).
- Goetz, G.J., Nsakala, N.Y., Patel, R.L., and Lao, T.C., "Combustion and Gasification Kinetics of Chars from Four Commercially Significant Coals of Varying Rank," Paper No. 15, Presented at the Second Annual Contractors Conference on Coal Gasification, Palo Alto, CA (Oct. 20-21, 1982).
- Grant, D.M., Pugmire, R.J., Fletcher, T.H., and Kerstein, A.R., "A Chemical Model of Coal Devolatilization Using Percolation Lattice Statistics," Presented at the 1988 Spring Meeting of the Western States Section/The Combustion Institute, Salt Lake City, UT (March 21-22, 1988).
- Grant, D.M. and Pugmire, R.J., private communication (1988).
- Guo, C.-T. and Zhang, L.-M., *Fuel*, **65**, 1364-67 (1986).
- Gupta, A. and G. Thodos, *AIChE J.*, **9**, 751 (1963).
- Hauserman, W.B., "Structural Properties Affecting the Settling of Coarse Crushed Coal in Gasifiers," DOE/FE/60181-25, Energy Research Center, Grand Forks, ND (1984).
- Hippo, E.J., Jenkins, R.G., and Walker, P.L., Jr., *Fuel*, **58**, 338, (1979).
- Hengel, T.D. and Walker, P.L., Jr., *Fuel*, **63**, 1214, (1984).
- Janicka, J. and Kollmann, W., *Comb. & Flame*, **44**, 319 (1982).
- Jones, P.G., Lindsay, J.D., and Hedman, P.O., "Fluid Dynamic Measurements in a Simulated Entrained Flow Coal Combustor, Western States Section/The Combustion Institute, Stanford, CA (Fall 1984).
- Kamotani, Y. and Gerber, I. "Experiments on Confined Turbulent Jets in Cross Flow," Final Report prepared for the National Aeronautics and Space Administration, Report No. CR-2392 (March 1974).

- Kobayashi, H., Howard, J.B. and Sarofim, A.F., 16th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 411 (1977).
- Kobayashi, H., "Devolatilization of Pulverized Coal at High Temperatures," Ph.D. Thesis, M.I.T., Dept. of Mechanical Engineering, Cambridge, MA, (1976).
- Kramlich, J.C., Malte, P.C., and Grosshandler, W.L., 18th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 151 (1984).
- Lindsay, J.D., Hedman, P.O. and Smith, P.J., "LDA Measurements in a Simulated Gasifier with Swirl," International Symposium on Laser Doppler Velocimetry, Lisbon, Portugal (July 1986).
- MacConald, I.F., M.S. El-Sayed, K. Mow, and F.A.L. Dullen, Ind. Eng. Chem. Fund., 18, 199 (1979).
- Merrick, D., Fuel, 62, 540-546 (1983).
- Milne, C.R. and Pershing, D.W., "Time Resolved Sulfation Rate Measurement for Sized Sorbents," Proc. 4th Annual Pittsburgh Coal Conf. (1987).
- Mitchell, R.E., "Determination of the Intrinsic Reactivities of Pulverized-Coal Chars at High Temperature," 1988 Spring Meeting, Western States Section/The Combustion Institute, Salt Lake City, UT (March 21-22, 1988).
- Neavel, R.C., Chemistry of Coal Utilization, 2nd Suppl. Vol., (M.A. Elliott, Ed.), John Wiley, Chapter 3, pg. 91, (1981).
- Nelson, J.R., Fuel, 62, 112 (1983).
- Nichols, K.M., Hedman, P.O. and Smoot, L.D., Fuel, 66, 1257, (1987).
- Nichols, K.M., "The Effects of Elevated Pressure on Nitrogen and Sulfur Pollutant Formation During Coal Gasification," M.S. Thesis, Department of Chemical Engineering, Brigham Young University, Provo, UT (1986).
- Niksa, S., Russel, W.B., and Saville, D.A. 20th Symposium (Int) on Combustion, The Combustion Institute, Pittsburgh, PA, pp. 1445-1453, (1984).
- Nsakala, N.Y., Essenhigh, R.H., and Walker, P.L., Fuel, 57, 605 (1978).
- Oh, M.S., "Softening Coal Pyrolysis", Sc.D. Thesis, Massachusetts Institute of Technology, Cambridge, Mass, (1985).
- Perry, R.H. and Green, D.W. Perry's Chemical Engineers' Handbook, 6th Edition, McGraw-Hill, NY, 9-5 (1984).
- Pope, S.B. and Correa, S.M., 21st Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 1341 (1986).
- Rohsenow, W.M., Hartnett, J.P., and Ganic, E.N., Handbook of Heat Transfer Applications, McGraw-Hill, NY (1985).
- Rossberg, M., Z. Electrochem., 60, 952 (1956).
- Serio, M.A., Hamblen, D.G., Markham, J.R., and Solomon, P.R., Energy and Fuels, 1, 138, (1987).

- Smith, P.J. and Fletcher, T.H., "A Study of Two Chemical Reaction Models in Turbulent Coal Combustion," Winter Annual ASME Meeting, Anaheim, CA, AMD-Vol. 81, (December 7-12, 1986).
- Smith, P.J. and Smoot, L.D., "Detailed Model for Practical Pulverized Coal Furnaces and Gasifiers," Quarterly Technical Progress Report No. 9 to a Consortium of U.S. Industries and Governmental Agencies, Brigham Young University, Provo, UT, (February 29, 1988).
- Smoot, L.D., Bartholomew, C.H., and Pershing, D.W., "Volume II - Research Program Second Annual Report," Advanced Combustion Engineering Research Center, Brigham Young University, Provo, UT (December 31, 1987).
- Solomon, P.R., Hamblen, D.G., and Best, P.E., "Coal Gasification Reactions with On-line In-situ FT-IR Analysis", U.S. DOE METC 6th Quarterly Report, Contract No. DE-AC21-81FE05122, (1983).
- Solomon, P.R. and Hamblen, D.G., Prog. Energy Combust., Sci., 9, 323 (1983).
- Solomon, P.R., Hamblen, D.G., Serio, M.A., Smoot, L.D., and Brewster, B.S., "Measurement and Modeling of Advanced Coal Conversion," 1st Annual Report, Work Performed Under Contract No., DE-AC21-86MC23075, U.S. Department of Energy, Morgantown, WV, (September 30, 1987).
- Solomon, P.R., Hamblen, D.G., Serio, M.A., Smoot, L.D., and Brewster, B.S., "Measurement and Modeling of Advanced Coal Conversion," 5th Quarterly Report, Work Performed Under Contract No., DE-AC21-86MC23075, U.S. Department of Energy, Morgantown, WV, (December 31, 1987).
- Solomon, P.R., Hamblen, D.G., Carangelo, R.M., and Krause, J.L., 19th Symposium (International) on Combustion, The Combustion Institute, Pittsburgh, PA, 1139, (1982).
- Solomon, P.R., Hamblen, D.G., Carangelo, R.M., Serio, M.A. and Deshpande, G.V., "A General Model of Coal Devolatilization," Energy & Fuels, 2 (4), 405, (1988).
- Solomon, P.R., Serio, M.A., Carangelo, R.M. and Markham, J.R., Fuel, 65, 182-194 (1986).
- Suuberg, E.M., "Rapid Pyrolysis and Hydropyrolysis of Coal". Sc.D. Thesis, Dept. of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, (1977).
- Suuberg, E.M., "Transport of Volatile Products in Porous Coals", Appendix A in U.S. DOE METC 5th Quarterly Report, Contract No. DE-AC21-86MC23075, (1987).
- Ubhayakar, S.K., Stickler, D.B., and Gannon, R.E., Fuel, 56, 281 (1977).
- Unger, P.E. and Suuberg, E.M., Fuel, 63, 606, (1984).
- Vafai, K., J. Energy Resour. Technol., 108, 131, (1980).
- van Krevelen, D.W., Properties of Polymers, Elsevier Scientific Publishing, Co., Amsterdam, (1976).
- Vorres, K.S., private communications, (1988).

- Waters, B.J., Mitchell, R.E., Squires, R.G., and Laurendeau, N.M., "Overall Kinetic Parameters for Combustion of a Highly Non-Spherical Carbon Char," 1988 Spring Meeting, Western States Section/The Combustion Institute, Salt Lake City, Utah (March 21-22, 1988).
- Webb, B.W., and Hedman, P.O., "LDV Measurements in a Simulated Entrained-Flow Coal Reactor," Proceedings of the Symposium on Engineering Applications of Laser Velocimetry, Fall ASME National Meeting, Phoenix, AZ (1982).
- Wells, W., Smoot, L.D., "Review of Preparation Methods for Chars," First Annual Report, Advanced Combustion Engineering Research Center, 52-7, (1987).
- Wells, W.F., "Reactivities of Selected Coal Chars with Oxygen," M.S. Thesis, BYU, Dept. of Chemical Engineering, Provo, UT (1985).
- Yagi S., and Kunii D, AIChE J., 6, (1), 97-104 (1960).
- Yagi S., Kunii D. and Wakao N., AIChE J., 6, 543 (1960).
- Yagi, S. and Wakao, N., AIChE J., E, (1), 79-85 (1959).
- Yoon, H., J. Wei and M.M. Denn, AIChE J., 24, 885 (1978).
- Young, L.L. and B.A. Finlayson, Ind. Eng. Chem. Fund., S, 412 (1973).