

JAMES CARL PIRKLE, JR.

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Department of Chemical and Biochemical Engineering
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EDUCATION

B. Ch.E. (Cooperative Plan) 1961, Georgia Institute of Technology
M.S. Chemical Engineering, 1962, Georgia Institute of Technology
Ph.D. Chemical Engineering, 1967, Georgia Institute of Technology
NIH-Postdoctoral Fellow. Biomedical Engineering, 1972-1974, Johns Hopkins University School of Medicine

RESEARCH INTERESTS

Computer Simulation of Chemical Engineering Processes
Reactor Engineering and Separations Processes
Process Systems Engineering and Control
Biomedical Engineering

PROFESSIONAL EMPLOYMENT

2000-present: Senior Research Associate, Department of Chemical and Biomolecular Engineering, University of Illinois, Urbana-Champaign. I conduct research in computer simulation of chemical and biomedical engineering processes.

1994-2000: Director of Development, College of Liberal Arts and Sciences, and Lecturer; Department of Chemical Engineering, University of Illinois; I managed corporate relations for the Department of Chemical Engineering and taught undergraduate courses

1978-1994: Head, Process Modeling, Exxon Research and Engineering Company; I made significant contributions to fundamental understanding of reaction and separations processes.

1974-1978: Assistant Professor, Department of Biomedical Engineering, Johns Hopkins University School of Medicine; I developed a model for the control of blood volume after trauma and validated it experimentally. This model led to a new fluid replacement strategy.

1966-1972: Senior Staff, Applied Physics Laboratory, Johns Hopkins University; I developed fuels for supersonic combustion ramjets and developed a computer simulation of supersonic combustion processes. I also performed theoretical investigations of a chemical laser, which led to its development.

1962-1966: Research Associate, Georgia Tech Engineering Experiment Station (now Georgia Tech Research Institute). I managed a saline water conversion project for the Office of Saline Waters and also developed a theory of molecular energy distribution in exothermic reactions for NASA.

HONORS AND PROFESSIONAL ACTIVITIES

NASA Technology Utilization Award 1968.

Research Career Development Award, National Institutes of Health 1975-80.

Chairman, Chemical Sciences Group, Society for Computer Simulation 1979, 1981, 1984.

Co-chairman, Technical Committee on Simulation in Chemical Industry, Society for Computer Simulation 1984-1987.

External Advisory Board, School of Chemical Engineering, Georgia Institute of Technology, 1985-1993.

Advisory Board, College of Engineering, University of Illinois, 1997

PROFESSIONAL SOCIETIES

American Institute of Chemical Engineers

Society for Computer Simulation

American Chemical Society

Biomedical Engineering Society

Sigma Xi (1966- Georgia Tech)

COURSES OR PARTS OF COURSES TAUGHT

Transport Phenomena in Physiological Systems, to graduate students in Biomedical Engineering, Johns Hopkins University School of Medicine

Applied Mathematics for Biomedical Engineering (portion of course), to graduate students in Biomedical Engineering, Johns Hopkins University School of Medicine

Introduction to Biomedical Engineering (portion of course), to graduate students in Biomedical Engineering, Johns Hopkins University School of Medicine

Cardiovascular Physiology, Fluid Control and the Endocrine System (portion of course), to first year medical students, Johns Hopkins University School of Medicine

Special Problems in Biomedical Engineering to undergraduate seniors in Chemical Engineering, University of Illinois

Special Problems in Reactor Engineering to undergraduate seniors in Chemical Engineering, University of Illinois

Introduction to Chemical Engineering: Material and Energy Balances, first course to undergraduate Chemical Engineering majors, University of Illinois

List of Publications (J. Carl Pirkle, Jr.)

1. J.C. Pirkle, Jr. and H.A. McGee, Jr., "Perturbed Morse Oscillator Approximation in Reactive Collisions. I. An Attractive Potential," J. Chem. Phys., Vol. 49, 3532 (1968).
2. J.C. Pirkle, Jr. and H.A. McGee, Jr., "Perturbed Morse Oscillator Approximation in Reactive Collisions. II. A Repulsive Potential," J. Chem. Phys., Vol. 49, 4504 (1968).
3. F.S. Billig, S.E. Grenleski, and J.C. Pirkle, Jr., "Ignition and Combustion Characteristics of Liquid Fuels for Hypersonic Ramjets," CPIA Preprint; Proc. of 12th JANAF Liquid Propulsion Meeting, Las Vegas, Nevada, November 17-19 (1970).
4. R.E. Walker and J.C. Pirkle, Jr., "Experimental Studies on Effects of Na Vapor Mixed with Active N₂," Bull. Am. Phys. Soc., Vol. 17, 298 (1972).
5. J.C. Pirkle, Jr. and V.G. Sigillito, "A Variational Approach to Low Peclet Number Heat Transfer in Laminar Flow," J. Comp. Phys., Vol. 9, 207 (1972).
6. J.C. Pirkle, Jr. and V.G. Sigillito, "Variational Treatment of Chemical Reaction and Diffusion in a Catalytic Tubular Reactor," Int. J. Engng. Sci., Vol. 10, 553 (1972).
7. J.C. Pirkle, Jr. and V.G. Sigillito, "Calculation of Coefficients in Certain Eigenfunction Expansions," Appl. Sci. Res., Vol. 26, 105 (1972).
8. J.C. Pirkle, Jr. and V.G. Sigillito, "Laminar Heat Transfer with Axial Conduction," Appl. Sci. Res., Vol. 26, 108 (1972).
9. R.E. Walker and J.C. Pirkle, Jr., "Experimental Studies of a Pure Chemical CO₂ Laser," IEEE J. Quant. Electr., Vol. QE9, 197 (1973).
10. T.O. Poehler, J.C. Pirkle, Jr. and R.E. Walker, "A High Pressure Pulsed Carbon Dioxide Chemical Transfer Laser," IEEE J. Quant. Electr., Vol. QE9, 83 (1973).
11. V.G. Sigillito and J.C. Pirkle, Jr., "A priori Inequalities and Norm Error Bounds for Solution of a Third-Order Diffusion-Like Equation," SIAM J. (Applied Mathematics), Vol. 25, 69 (1973).
12. J.C. Pirkle, Jr., V.G. Sigillito, and T.O. Poehler, "Numerical Procedure for a Pulsed Deuterium Fluoride-Carbon Dioxide Laser," J. Comp. Phys., Vol. 15, 293 (1974).
13. J.C. Pirkle, Jr. and V.G. Sigillito, "Analysis of Optically Pumped Carbon Dioxide Laser," Appl. Opt., Vol. 13, 2799 (1974).

14. J.C. Pirkle, Jr. and D.S. Gann, "Restitution of Blood Volume after Hemorrhage: Mathematical Description," *Am. J. Physiol.*, Vol. 228, 821 (1975).
15. D.S. Gann, G.L. Cryer, and J. C. Pirkle, Jr., "Fast Feedback Inhibition of ACTH Requires Stress," *Proc. 47th Ann. Mtg. Endocrine Society*, 235 (1975).
16. D.S. Gann and J.C. Pirkle, Jr., "Role of Cortisol in Restitution of Blood Volume after Hemorrhage," *Amer. J. Surg.*, Vol. 130, 565 (1975).
17. J.C. Pirkle, Jr. and D.S. Gann, "Expansion of Interstitial Fluid Is Required for Full Restitution of Blood Volume After Hemorrhage," *J. Trauma*, Vol. 16, 937 (1976).
18. J.C. Pirkle, Jr. and D.S. Gann, "Restitution of Blood Volume After Hemorrhage: Role of the Adrenal Cortex," *Am. J. Physiol.*, Vol. 230, 1683 (1976).
19. J.C. Pirkle, Jr. and D.S. Gann, "Mathematical Model of Blood Control After Hemorrhage: Implication for Intravenous Fluid Therapy," *Proc. 1976 Summer Computer Simulation Conference*, 482 (1976).
20. D.S. Gann, D.G. Ward, A.G. Baertschi and J.C. Pirkle, Jr., "Homeostasis of Blood Volume Through Hemodynamic Control of ACTH and Cortisol," *Proc. 5th Int'l Congr. Endocrinology*, 245 (1976).
21. G.L. Cryer, D.S. Gann and J.C. Pirkle, Jr., "Physiological Inhibition and Facilitation of the Adrenocortical Response to Hemorrhage," *Am. J. Physiol.*, Vol. 232, R5 (1977).
22. J.C. Pirkle, Jr., "Analysis of Water Distribution Among Vascular, Interstitial and Intracellular Compartments During Fluid Deficits," *Proc. 1977 Summer Computer Simulation Conference*, 551 (1977).
23. J.C. Pirkle, Jr., G.J. Byrnes and D.S. Gann, "Role of Cortisol in Cardiovascular Stabilization Following Hemorrhage," *Physiologist*, (1977).
24. J.C. Pirkle, Jr., D.S. Gann and J.L. Houghton, "Variable Rate of Infusion of Isotonic Saline After Large Hemorrhage Avoids Cardiovascular Overload," *Fed. Proc.*, Vol. 37, 218 (1978).
25. G.J. Byrnes, J.C. Pirkle, Jr. and D.S. Gann, "Cardiovascular Stabilization After Hemorrhage Depends Upon Restitution of Blood Volume," *J. Trauma*, Vol. 18, 623 (1978).
26. J.C. Pirkle, Jr., E.W. Funk and W.G. May, "Computer Design of Multistage Sedimentation Operation for Separation of Ashpaltenes, Sand and Bitumen in Tar Sand," *Proc. 1979 Summer Computer Simulation Conference*, 213 (1979).

27. J.C. Pirkle, Jr., I.E. Wachs and J.E. Sobel, "Numerical Methods for Simulation of Fixed-Bed Reactors for Complex Exothermic Reactions," in Foundations of Computer-Aided Process Design, R.S.H. Mah and W.D. Seider (eds.) (1981), pp. 401-429.
28. J.C. Pirkle, Jr., "Design of Countercurrent Adsorption Separation Process," Proc. 1981 Summer Computer Simulation Conference, 173 (1981).
29. D.S. Gann, D. Carlson, G.J. Byrnes, J.C. Pirkle, and C. Allen-Rowlands, "Impaired Restitution of Blood Volume After Large Hemorrhage," J. Trauma, Vol. 21, 598 (1981).
30. J.C. Pirkle, D.S. Gann and C. Allen-Rowlands, "Role of the Pituitary in Restitution of Blood Volume Following Hemorrhage," Endocrinology, Vol. 110, 7 (1982).
31. J.C. Pirkle, Jr., "Mathematical Model for Multiphase Fixed-Bed Reactors," Proc. 1982 Summer Computer Simulation Conference, 456 (1982).
32. S.S. Hu, A.K. Didwania, W.G. May, J.C. Pirkle, W.G. May, and W.E. Schiesser, "An Adaptive Grid for the Numerical Method of Lines Solution of Adsorption and Chromatography Equations," Proc. IMACS 10th World Congress, 159 (1982).
33. J.C. Pirkle, Jr. and W.E. Schiesser, "Method of Lines Solution of Two-Dimensional Reactor Models," Proc. 1983 Summer Computer Simulation Conference, 60 (1983).
34. D.S. Gann, D.E. Carlson, G.J. Byrnes, J.C. Pirkle, Jr., and C.F. Allen-Rowlands, "Role of Solute in the Early Restitution of Blood Volume After Hemorrhage," Surgery, Vol. 94, 439 (1983).
35. E.W. Funk, J.C. Pirkle, Jr. and W.G. May, "Processing Approach for the Solvent Extraction of Athabasca Tar Sands," Energy Progress, Vol. 4, 12 (1984).
36. J.C. Pirkle, Jr. and W.E. Schiesser, "The Effect of Transport Coefficients in PDE Models of Chemical Engineering Systems," Proc. 1984 Summer Computer Simulation Conference, 656 (1984).
37. J.H. Siegell, J.C. Pirkle, Jr., and G.D. Dupre, "Crossflow Magnetically Stabilized Bed Chromatography," Separation Science and Technology, Vol. 19, 977 (1985).
38. J.C. Pirkle, Jr., W.E. Schiesser and K.R. Weiner, "Integration of Partial Differential Equation Systems on Micro (Personal) Computers," Proc. 1985 Summer Computer Simulation Conference, 368 (1985).
39. J.C. Pirkle, Jr. and J.G. Stevens, "Nonlinear Equations in Chemical Process Simulation: Overview and Directions," Proc. 1985 Summer Computer Simulation Conference, 320 (1985).

40. J.C. Pirkle, Jr. and W.E. Schiesser, "A Survey of PDE Software," Proceedings of 1986 Summer Computer Simulation Conference, 89 (1986).
41. J.C. Pirkle, Jr. and J.G. Stevens, "Parameter Estimation in Chemical Simulation: Theory and Applications," Proceedings of 1986 Summer Computer Simulation Conference, 278 (1986).
42. J.H. Siegell, G.D. Dupre, and J.C. Pirkle, Jr., "Chromatographic Separations in a Crossflow Magnetically Stabilized Bed," in Recent Advances in Separation Techniques-III, N.N. Li (Editor), AIChE Symposium Series, Vol. 82, No. 250, (1986), pp. 128-134.
43. J.H. Siegell, G.D. Dupre, and J.C. Pirkle, Jr., "Chromatographic Separations in a Crossflow Magnetically Stabilized Bed," Chem. Eng. Prog., Vol. 82, No. 11, 57 (1986).
44. J.C. Pirkle and W.E. Schiesser, "DSS/2: A Transportable Fortran 77 Code for Systems of Ordinary and One, Two and Three-Dimensional Partial Differential Equations," Proceedings of Summer Computer Simulation Conference, 345 (1987).
45. J.C. Pirkle, Jr. and I. E. Wachs, "Activity Profiling in Catalytic Reactors," Chem. Eng. Prog., Vol. 83, No. 8, 29 (1987).
46. J.C. Pirkle, Jr., S. Reyes, P.S. Hagan, H. Kheshgi and W.E. Schiesser, "Solution of Dynamic Distributed Parameter Model of Nonadiabatic Fixed-Bed Reactor," Comp. Chem. Eng., Vol. 11, 737 (1987).
47. P. Hagan, M. Herskowitz, and C. Pirkle, "Equilibrium Temperature Profiles in Highly Sensitive Tubular Reactors," SIAM J. (Applied Mathematics), Vol. 47, 1287 (1987).
48. M.A. Richard and J.C. Pirkle, Jr., "CO Hydrogenation Over Thallium-Promoted Iron. I. Hydrocarbon Synthesis," Ind. Eng. Chem. Res., Vol. 27, 264 (1988).
49. J.C. Pirkle, Jr. and J.H. Siegell, "Mathematical Analysis of Crossflow Magnetically Stabilized Fluidized Bed Chromatography," Ind. Eng. Chem. Res., Vol. 27, 823 (1988).
50. J.C. Pirkle, Jr., P.A. Ruziska, and L.J. Shulik, "Circulating Magnetically Stabilized Bed Reactors," Chemical Engineering Communications, Vol. 67, 89 (1988).
51. H.S. Kheshgi, P.S. Hagan, S.C. Reyes and J.C. Pirkle, "Transients in Tubular Reactors: Comparison of One- and Two-Dimensional Models," A.I.Ch.E.J., Vol. 34, 1373 (1988).
52. P. Hagan, M. Herskowitz, and C. Pirkle, "A Simple Approach to Highly Sensitive Tubular Reactors," SIAM J. (Applied Mathematics), Vol. 48, 1083 (1988).
53. P. Hagan, M. Herskowitz, and C. Pirkle, "Runaway in Highly Sensitive Tubular Reactors," SIAM J. (Applied Mathematics), Vol. 48, 1437, (1988).

54. J.C. Pirkle and H.S. Khashgi, and P.S. Hagan, "An Accurate One-Dimensional Model for Nonadiabatic Annular Reactors," A.I.Ch.E. J., Vol. 37, 1265, (1991).
55. J.H. Siegel, J.C. Pirkle and G.D. Dupre, "Crossflow Magnetically Fluidized Bed Chromatography," in Preparatory and Production Scale Chromatography with Applications. G. Ganetsos and P.E. Barker (Eds.), Chapter 7, Marcel Dekker (1992), pp. 143-170.
56. J.C. Pirkle, Jr. and R. D. Braatz. "Dynamic modeling of blown film extrusion." Polymer Engineering & Science, Vol. 43, pp. 398-418,(2003)
57. M. Fujiwara, J. C. Pirkle Jr., T. Togkalidou, D. L. Ma, R. Gunawan, and R. D. Braatz. "A holistic approach to materials process design." J. of Materials Education, Vol. 24, pp. 65-70, (2003).
58. J.C. Pirkle, Jr. and R. D. Braatz, Comparison of the Dynamic Thin Shell and Quasi-cylindrical Models for Blown Film Extrusion, Polymer Engineering & Science, Vol. 44, pp. 1267-1276, (2004)
59. R.D. Braatz, M. Fujiwara, J.C. Pirkle, Jr., Rudyanto Gunawan, and Timokleia Togkalidou, "A holistic approach to chemical process design and development." In Proc. Of the ASEE Annual Conf. And Exposition, Salt Lake City, Utah, June 20-23, (2004).

List of Presentations (J. Carl Pirkle, Jr.)

1. "Multiple Effect Humidity Process," with R. Sponder, G.W. Gibson and W.N. Grune, presented at Solar Energy Symposium, University of Florida, April, 1963.
2. "Monte Carlo Calculation of Chemical Kinetic Processes," Seminar Speaker, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia, April, 1964.
3. "Quantum Mechanical Calculation of Chemical Reaction Cross-sections," Seminar Speaker, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia, April, 1966.
4. "Ignition and Combustion Characteristics of Liquid Fuels for Hypersonic Ramjets," with F.S. Billig and S.E. Grenleski, presented at 12th JANAF Liquid Propulsion Meeting, Las Vegas, Nevada, November 17-19, 1970.
5. "Experimental Studies on Effects of Na Vapor Mixed with Active N₂," with R.E. Walker, presented at 24th Annual Gaseous Electronic Conference, American Physical Society, University of Florida, October 5-8, 1971.

6. "Experimental Studies of a Pure Chemical CO₂ Laser," with R.E. Walker, presented at 3rd Conference on Molecular Lasers, St. Louis, Missouri, May 1-3, 1972.
7. "Hormonal Control of Blood Volume after Hemorrhage," Seminar Speaker, Department of Physiology, University of Western Ontario College of Medicine, London, Ontario, September 1973.
8. "Mechanism of Restitution of Blood Volume after Hemorrhage," with D.S. Gann, presented at 58th Annual Meeting of Federation of American Societies of Experimental Biology, Atlantic City, NJ, April, 1974.
9. "Role of the Adrenal Gland in Restitution of Blood Volume after Hemorrhage," with D.S. Gann, presented at the 6th Annual Meeting of the Biomedical Engineering Society, New Orleans, La., April, 1975.
10. "Mathematical Model of Blood Volume Control," Seminar Speaker, Biomedical Engineering Department, Johns Hopkins University School of Medicine, Baltimore, Maryland, September, 1975.
11. "Expansion of Interstitial Fluid is Required for Full Restitution of Blood Volume after Hemorrhage," with D.S. Gann, presented at the Annual Meeting of the American Association for the Surgery of Trauma, Scottsdale, Arizona, September, 1975.
12. "Cortisol Mediates Restitution of Blood Volume after Hemorrhage," with D.S. Gann, presented at the Annual Meeting of the American Physiological Society, San Francisco, CA, October, 1975.
13. "Pituitary and Adrenal Glands Are Required for Full Restitution of Blood Volume after Hemorrhage," with D.S. Gann, presented at the 60th Annual Meeting of The Federation of American Societies of Experimental Biology, Anaheim, CA, April, 1976.
14. "Mathematical Model of Blood Volume Control after Hemorrhage: Implication for Intravenous Fluid Therapy," with D.S. Gann, presented at the 1976 Summer Computer Simulation Conference, Washington, D.C., July, 1976.
15. "Mathematical Simulation of Restitution of Blood Volume for First 24 Hours after Hemorrhage," with D.S. Gann, presented at the Annual Meeting of the American Physiological Society, University of Pennsylvania, Philadelphia, PA, August, 1976.
16. "Role of Blood Volume Restitution in Cardiovascular Stabilization after Hemorrhage," with G.J. Byrnes and D.S. Gann, presented at the 61st Annual Meeting of the Federation of American Societies of Experimental Biology, Chicago, Illinois, April, 1977.

17. "Analysis of Water Distribution Among Vascular, Interstitial and Intracellular Compartments During Fluid Deficits," presented at the 1977 Summer Computer Simulation Conference, Chicago, IL, July, 1977.
18. "Cardiovascular Stabilization after Hemorrhage Depends upon Restitution of Blood Volume," with G.J. Byrnes and D.S. Gann, presented at the Thirty-Seventh Annual Session of the American Association for the Surgery of Trauma, Detroit, Michigan, September 1977.
19. "Role of Endocrine System in the Restitution of Blood Volume after Hemorrhage," Seminar Speaker, Department of Biomedical Engineering, University of Virginia, Charlottesville, Virginia, September, 1977.
20. "Role of Cortisol in Cardiovascular Stabilization Following Hemorrhage," with G.J. Byrnes and D.S. Gann, presented at the Annual Meeting of the American Physiological Society, Miami, FL, October, 1977.
21. "Variable Rate of Infusion of Isotonic Saline after Large Hemorrhage Avoids Cardiovascular Overload," with D.S. Gann and J.L. Houghton, presented at the 62nd Annual Meeting of the Federation of American Societies of Experimental Biology, Atlantic City, NJ, April, 1978.
22. "Computer Design of Multistage Sedimentation Operation for Separation of Asphaltenes, Sand, and Bitumen in Tar Sands," with W. Levy, E.W. Funk, and W.G. May, presented at the 1979 Summer Computer Simulation Conference, Toronto, Ontario, July, 1979.
23. "Application of Fourier Transforms to Chemical Reactor Analysis," Seminar Speaker, Department of Mathematics and Computer Science, Montclair State College, Montclair, NJ, February, 1980.
24. "Numerical Methods for Simulation of Fixed-Bed Reactors for Complex Exothermic Reactions," with I.E. Wachs and J.E. Sobel, presented at the International Conference on Foundations of Computer-Aided Process Design, Henniker, N.H., July, 1980.
25. "Comparison of Finite Difference, Orthogonal Collocation and Finite Element Methods in Simulation of Fixed-Bed Reactors," Seminar Speaker, Department of Chemical Engineering, University of Wisconsin, Madison, Wisconsin, April 1980.
26. "Impaired Restitution of Blood Volume after Large Hemorrhage," with D.S. Gann, D.E. Carlson, G.J. Byrnes, and C.F. Allen-Rowlands, presented at the Fortieth Annual Session of the American Association for the Surgery of Trauma, Phoenix, Arizona, September 1980.
27. "Design of Countercurrent Adsorption Separation Processes: Comparison of Theoretical Stage and Differential Equation Models," Seminar Speaker, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia, February, 1981.

28. "Design of Countercurrent Adsorption Separation Process," presented at the 1981 Summer Computer Simulation Conference, Washington, DC, July 1981.
29. "Mathematical Model for Multiphase Fixed Bed Reactors," presented at the 1982 Summer Computer Simulation Conference, Denver, CO, July 19-21, 1982
30. "Computer Simulation of Multiphase Fixed-Bed Reactors," Seminar Speaker, Department of Chemical Engineering, Lehigh University, Sept. 1982.
31. "Syngas to Hydrocarbons on Thallium Promoted Iron," with M.A. Richard and F.J. Wright, Eighth North American Meeting of the Catalyst Society, Philadelphia, Pa., May 1-4, 1983.
32. "CO/H₂ to Higher Alcohols over Thallium Promoted Iron," with M.A. Richard, 186th National American Meeting of the Catalysis Society, Division of Colloid and Surface Chemistry, Washington, D.C., August 28 - September 2, 1983.
33. "Method-of-Lines Solution of Two-Dimensional Reactor Models," with W.E. Schiesser, presented at 1983 Summer Computer Simulation Conference Vancouver, B.C., July 11-13, 1983.
34. "The Effect of Transport Coefficients in PDE Models of Chemical Engineering Systems," with W.E. Schiesser, presented at 1984 Summer Computer Simulation Conference, Boston, Massachusetts, July 23-25, 1984.
35. "Nonlinear Equations in Chemical Process Simulation: Overview and Directions," with J.G. Stevens, presented at 1985 Summer Computer Simulation Conference, Chicago, Illinois, July 22-26, 1985.
36. "Integration of Partial Differential Equation Systems on Micro (PERSONAL) Computers," with W.E. Schiesser, presented at 1985 Summer Computer Simulation Conference, Chicago, Illinois, July 22-26, 1985.
37. "Chromatographic Separations in a Crossflow Magnetically Stabilized Bed," with J.H. Siegell and G.D. Dupre, presented at A.I.Ch.E. Summer National Meeting, Seattle, Washington, August 1985.
38. "CO Hydrogenation Over Fe/Tl: Selectivity Control by Varying Pretreatment Conditions," Presented at University of Utah, Fuel Sciences Departmental Seminar, September 26, 1985. Co-author: M.A. Richard
39. "Circulating Magnetically Stabilized Bed Reactor," Seminar Speaker, Department of Chemical Engineering, North Carolina State University, April 10, 1986.

40. "Analysis of Magnetically Stabilized Bed Reactor," Seminar Speaker, Department of Chemical Engineering, University of Illinois, April 22, 1986.
41. "A Simple Approach to Highly Sensitive Tubular Reactors," with P.S. Hagan, M. Herskowitz, presented at Rensselaer Polytechnic Institute, Applied Mathematics Departmental Seminar, April 30, 1986.
42. "A Survey of PDE Software," with W.E. Schiesser, presented at the Summer Computer Simulation Conference, Reno, Nevada, July 28-30, 1986.
43. "Practical Optimization and Parameter Estimation: Overview and Directions in the Chemical Sciences," presented at the 1986 Summer Computer Simulation Conference, Reno, Nevada, July 28-30, 1986.
44. "Order-reduction in Dynamic Distributed Parameter Models of Fixed-Bed Chemical Reactors," presented at the 1986 Summer Computer Simulation Conference, Reno, Nevada, July 28-30, 1986.
45. "Analysis of Circulating Magnetically Stabilized Bed Reactor," presented at 192nd National Meeting of American Chemical Society, Anaheim, California, September 7-12, 1986.
46. "Analysis of Circulating Magnetically Stabilized Bed Reactor," Seminar Speaker, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, Georgia, October 13, 1986.
47. "Reassessment of Activity Profiling in Exothermic, Fixed-Bed Catalytic Reactors," with I.E. Wachs, presented at A.I.Ch.E. Annual Meeting, Miami Beach, FL, November 2-7, 1986.
48. "Circulating Magnetically Stabilized Bed Reactor," with P.A. Ruziska and L.J. Shulik, presented at A.I.Ch.E. Annual Meeting, Miami Beach, FL, November 2-7, 1986.
49. "Dynamic Simulation of Complex, Multi-stage Separation and Reactor Systems by a Modified DDS/2 Simulator," with W.E. Schiesser, presented at A.I.Ch.E. Annual Meeting, Miami Beach, FL, November 2-7, 1986.
50. "Selected Applications of Magnetically Stabilized Fluidized Beds," with R.J. Bellows and Dennis Wu, presented at the Alpha Chi Sigma Award Symposium, A.I.Ch.E. Annual Meeting, Miami Beach, FL, November 2-7, 1986.
51. "Transients in Tubular Reactors: Comparison of One- and Two-Dimensional Models," with H.S. Kheshgi, P.S. Hagan, S.C. Reyes, presented at 1987 Summer Computer Simulation Conference, Montreal, Quebec, Canada, July 28, 1987.
52. "DSS/2: A Transportable Fortran 77 Code for Systems of Ordinary and One, Two and Three-Dimensional Partial Differential Equations," with W.E. Schiesser, presented at the 1987 Summer Computer Simulation Conference, Montreal, Quebec, Canada, July 28, 1987.

53. "Transients in Tubular Reactors: Comparison of One- and Two-Dimensional Models," with H.S. Khesghi, P.S. Hagan, S.C. Reyes, presented at the A.I.Ch.E. Annual Meeting, New York, N.Y., November 15-20, 1987.
54. "A Simple Approach to Highly Sensitive Tubular Reactors," with P.S. Hagan and M. Herskowitz, presented at the A.I.Ch.E. Annual Meeting, New York, N.Y., November 15-20, 1987.
55. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, Rice University, August 31, 1989.
56. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, University of Houston, October 6, 1989.
57. "Inequality Analysis of Countercurrent Separation Processes," with W.G. May and J.G. Stevens, presented at the Alpha Chi Sigma Award Symposium, A.I.Ch.E. Annual Meeting, San Francisco, CA, November 5-10, 1989.
58. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, University of Florida, November 16, 1989.
59. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, Modeling, Dynamics and Control Group, University of Texas, November 27, 1989.
60. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, Louisiana State University, November 20, 1992.
61. "Dynamic Simulation of Nonadiabatic Tubular Reactors," Seminar Speaker, Department of Chemical Engineering, University of Illinois, Urbana-Champaign, November 1, 1993.
62. "Dynamic Simulation of Heterogeneous Catalytic Reactors: Some Case Studies," Seminar Speaker, Department of Chemical Engineering, Lehigh University, April 2, 1997
63. "Method of Lines Analysis of Multidimensional Chemical Reactors," with A.V. Wouwer, P. Saucez, and W.E. Schiesser; presented at the First SIAM Conference on Computational Science and Engineering, Washington, DC, September 22, 2000.
64. "A holistic approach to materials process design," with Mitsuko Fujiwara, Timokleia Togkalidou, David L. Ma, Rudyanto Gunawan, and R. D. Braatz *Int. Conf. on Materials for Advanced Technologies*, Symposium H: Materials Science and Engineering Education in New Millennium, Singapore, 2001. Paper H4-04-IN.

65. "A holistic approach to chemical process design and development." With R.D. Braatz, M. Fujiwara, E.J. Hukkanen, T. Togkalidou, and R. Gunawan. In Proc. of the ASEE Annual Conf. And Exposition, Salt Lake City, Utah, Paper 1413.1, June 20-23, 2004.

66. "Dynamics and parameter sensitivity analysis for a two-phase microstructural model for dynamic blown-film extrusion: Theory and experiments." AIChE Annual Meeting, Austin, TX, Session on "Polymer Processing and Rheology I," November 7-12, 2004.

67. "Mathematical Modeling of Blown Film Extrusion," Invited speaker at Pi Mu Epsilon Mathematical Honor Society Banquet, Austin Peay State University, March 27, 2006.

List of Patents (J.C. Pirkle, Jr.)

1. "High Reactivity Fuels for Supersonic Combustion Ramjets," Billig, F.S.; Pirkle, J.C., Jr.; and Grenleski, S.E., Jr.; U.S. 3,883,376; May 13, 1975.

2. "Solvent Extraction of Tar Sands," Funk, Edward W.; May, Walter G.; Pirkle, James C., Jr.; U.S. 4,347,118; August 31, 1982.

3. "Process for Producing Alcohols Using Iron-Thallium Catalysts," Wright, F.J.; Richard, M.A.; and Pirkle, J.C., Jr.; U.S. 4,504,600; March 12, 1985.

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