

VITAE - COSTAS TSOURIS

Costas Tsouris is a chemical engineer with a Diploma of Engineering from the Aristotle University of Thessaloniki-Greece, and Masters and Ph.D. degrees from Syracuse University. Since 1992, he has been working on separations problems in the Chemical Technology, Nuclear Science and Technology, and Environmental Sciences Divisions at the Oak Ridge National Laboratory (ORNL). He currently holds a Joint Faculty Appointment with ORNL and the Georgia Institute of Technology. He is a member of the American Institute of Chemical Engineers — Separations Division, North American Mixing Forum — and American Chemical Society — Colloid and Surface Science Division. He is also a member of the Editorial Board of the “Journal of Dispersion Science and Technology” and has served as Guest Editor of two Special Issues of “Separation and Purification Technology,” entitled *Electroseparations*, 1997, and *Electrochemical and Reactive Separations*, 1999. He has published more than 70 articles in peer reviewed journals and holds five U.S. patents, with two more pending.

ADDRESS:

Oak Ridge National Laboratory
P.O. Box 2008
1 Bethel Valley Road
Oak Ridge, TN 37831-6181
Phone: (865) 241-3246
Fax: (865) 241-4829
E-mail: tsourisc@ornl.gov

EARNED DEGREES:

Ph.D. Syracuse University, 1992. Department of Chemical Engineering and Materials Science
M.Sc. Syracuse University, 1988. Department of Chemical Engineering and Materials Science
Diploma of Engineering Aristotle University (Greece), 1984. Chemical Engineering

EMPLOYMENT:

6/94 – present: Research Staff Member, Oak Ridge National Laboratory
10/03 – present: Joint Oak Ridge National Laboratory / Georgia Institute of Technology Faculty
9/97 – 9/03: Adjunct Associate Professor, Georgia Institute of Technology
10/92 – 6/94: Postdoctoral Research Associate, Oak Ridge National Laboratory

RESEARCH INTERESTS:

His research interests include separations enhanced by electric and magnetic fields (electroextractions: electroextraction, electrodistillation, electrofiltration, electrosorption, electropumping, electromixing, electrooxidation, electroozonation, magnetic flocculation, magnetic filtration), particle interaction forces in colloidal systems and their effects on aggregation and filtration of colloidal particles, turbulent liquid dispersions encountered in extractive/reactive systems, and interfacial phenomena in gas-liquid, liquid-liquid, and solid-liquid systems with applications in separations. He studied drop coalescence and breakup in liquid-liquid extraction systems; electrohydrodynamic pumping, spraying, and mixing of fluids; and bubble interactions in gas/liquid reactive systems. He recently employed electrohydrodynamic flows in microfluidic devices performing pumping and mixing operations. In parallel, he works on gas hydrates as a means for carbon storage in the ocean, as well as gas separations.

PROFESSIONAL AFFILIATIONS:

American Institute of Chemical Engineers (AIChE)
Separations Division of AIChE
North American Mixing Forum (NAMF)
American Chemical Society (ACS)

PROFESSIONAL ACTIVITIES:

Session Organizer and Chair: Annual AIChE Meeting, San Francisco, CA, November 2003 and Annual AIChE Meeting, Austin, TX, November 2004.

Co-Chair, 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June, 2003

Member of the Advisory Board of the Journal of Dispersion Science and Technology, 2001-present

Organizer of the "Carbon Management Seminar Series," Oak Ridge National Laboratory, 2002.

Session Organizer and Chair: Annual AIChE Meeting, Indianapolis, IN, November 2002

Session Organizer and Chair: Annual AIChE Meeting, Reno, NV, November 2001

Session Chair: ACS Colloid and Surface Science Symposium, Carnegie Mellon, PA, June 2001

Session Organizer and Chair: Annual AIChE Meeting, Los Angeles, CA, November 2000

Session Organizer and Chair: Annual AIChE Meeting, Dallas, TX, November 1999

Session Chair: Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 1999

Session Chair: Emerging Technologies in Hazardous Waste Management VIII, I&EC Division Special Symposium, American Chemical Society, Birmingham, AL, September, 1996

Session Chair: MIXING XV, Banff, Canada, June 1995

Guest Editor: Special Issue of Separation and Purification Technology entitled *Electrochemical and Reactive Separations*, 1999.

Guest Editor: Special Issue of Separation and Purification Technology entitled *Electro-separations*, 1997.

Reviewer for:

Proposals: National Science Foundation, Petroleum Research Fund, Department of Energy

Papers: AIChE Journal; Industrial and Engineering Chemistry Research; Separation Science and Technology; Separations Technology; Applied Biochemistry and Biotechnology; Journal of Colloid and Interface Science; Langmuir; Separation and Purification Technology; Chemical Engineering Communications; The Canadian Journal of Chemical Engineers; Colloids and Surfaces; Journal of Fluid Mechanics

PUBLISHED BOOKS OR PARTS OF BOOKS:

1. Tsouris, C., D.W. DePaoli, J.Q. Feng, and T.C. Scott, "Electrostatic Spraying of Gases into Liquids," p. 52-60 in *Industrial Mixing Fundamentals with Applications*, eds. G. B. Tatterson, R. V. Calabrese, and W. R. Penney, AICHE Symposium Series S-305, AIChE Publications, NY, 1995.

PUBLICATIONS IN REFEREED JOURNALS:

1. Kirou, V., L.L. Tavlarides, J.C. Bonnet, and C. Tsouris, "Flooding, Holdup, and Drop Size Measurements in a Multistage Column Extractor," AICHE Journal, **34**, 283-292 (1988).
2. Schmidt, H., C. Tsouris, E. Eggert, and L.L. Tavlarides, "Laser Photometric Probe for Concentration Measurements in Liquid Dispersions," AICHE Journal, **35**, 507-510 (1989).
3. Tsouris, C., and L.L. Tavlarides, "Dispersed Phase Residence Times and Axial Drop Velocities in a Multistage Column Extractor," Chemical Engineering Science, **45**, 785-793 (1990).
4. Tsouris, C., L.L. Tavlarides, and J.C. Bonnet, "Application of the Ultrasonic Technique for Real-Time Holdup Monitoring for the Control of Extraction Columns," Chemical Engineering Science, **45**, 3055-3062 (1990).
5. Tsouris, C., and L.L. Tavlarides, "Comments on Model for Holdup Measurements in Liquid Dispersions Using an Ultrasonic Technique," Industrial and Engineering Chemistry Research, **29**, 2170-2172 (1990).
6. Tsouris, C., R. Ferreira, and L.L. Tavlarides, "Characterization of Hydrodynamic Parameters in a Multistage Column Contactor," Canadian Journal of Chemical Engineering, **68**, 913-923 (1990).
7. Tsouris, C., and L.L. Tavlarides, "Control of Dispersed-Phase Volume Fraction in Multistage Extraction Columns," Chemical Engineering Science, **46**, 2857-2865 (1991).
8. Tavlarides, L.L., and C. Tsouris, "Experimental Methods to Characterize, Monitor, and Control Liquid-Liquid Processes," Chemical Engineering Education, **26**, 66-71, Spring (1992).
9. Tsouris, C., S. Yiacoymi, and C. Hirtzel, "A Colloquium Series in Chemical Engineering," Chemical Engineering Education, **26**, 200-204, Fall (1992).
10. Tsouris, C., and L.L. Tavlarides, "Control of Dispersed-Phase Volume Fraction and Solute-Concentration in Multistage Extraction Columns," Chemical Engineering Science, **48**, 4097-4104 (1993).
11. Tsouris, C., and L.L. Tavlarides, "Mass-Transfer Effects on Droplet Phenomena and Extraction Column Hydrodynamics Revisited," Chemical Engineering Science, **48**, 1503-1515 (1993).
12. Tsouris, C., and L.L. Tavlarides, "Volume Fraction Measurements of Water in Oil by an Ultrasonic Technique," Industrial and Engineering Chemistry Research, **32**, 998-1002 (1993).
13. Tsouris, C., and L.L. Tavlarides, "Breakage and Coalescence Models for Drops in Turbulent Dispersions," AICHE Journal, **40**, 395-406 (1994).
14. Tsouris, C., V.I. Kirou, and L.L. Tavlarides, "Drop Size Distribution and Holdup Profiles in a Multistage Extraction Column," AICHE Journal, **40**, 407-418 (1994).

15. Tsouris, C., D.W. DePaoli, J.Q. Feng, O.A. Basaran, and T.C. Scott, "Electrostatic Spraying of Nonconductive Fluids into Conductive Fluids," *AIChE Journal*, **40**, 1920-1923 (1994).
16. Tsouris, C., and L.L. Tavlarides, "Response to Comments on Hold-Up (Volume Fraction) Measurements in Liquid/Liquid Dispersions by Using an Ultrasonic Technique," *Industrial and Engineering Chemistry Research*, **33**, 748-749 (1994).
17. Tsouris, C., D.W. DePaoli, J.Q. Feng, and T.C. Scott, "Experimental Investigation of Electrostatic Dispersion of Nonconductive Fluids into Conductive Fluids," *Industrial and Engineering Chemistry Research*, **34**, 1394-1403 (1995).
18. Tsouris, C., and T.C. Scott, "Flocculation of Paramagnetic Particles in a Magnetic Field," *Journal of Colloid and Interface Science*, **171**, 319-330 (1995).
19. Tsouris, C., T.C. Scott, and M.T. Harris, "Para- and Dia-magnetic Particle Flocculation in a Magnetic Field," *Separation Science and Technology*, **30**, 1407-1419 (1995).
20. Feng, J.Q., D.W. DePaoli, C. Tsouris, and T.C. Scott, "Spraying Fine Bubbles or Droplets in Insulating Fluid Systems by Electrostatic Polarization Forces," *Journal of Applied Physics*, **78**, 2860-2862 (1995).
21. Tsouris, C., S. Yiacoumi, and T.C. Scott, "Kinetics of Heterogeneous Magnetic Flocculation using the Bivariate Population-Balance Equation," *Chemical Engineering Communications*, **137**, 147-159 (1995).
22. Tsouris, C., M.A. Norato, and L.L. Tavlarides, "A Pulse-Echo Ultrasonic Probe for In-Situ Volume Fraction Measurements in Liquid-Liquid Dispersions," *Industrial and Engineering Chemistry Research*, **34**, 3154-3158 (1995).
23. Tsouris, C., H.M. Lizama, M.A. Spurrier, T.L. Takeuchi, and T.C. Scott, "Hydrodynamics of Bioreactor Systems for Liquid-Liquid Contacting," *Applied Biochemistry and Biotechnology*, **57**, 581-592 (1996).
24. Yiacoumi, S., D.A. Rountree, and C. Tsouris, "Mechanism of Particle Flocculation by Magnetic Seeding," *Journal of Colloid and Interface Science*, **184**, 477-488 (1996).
25. Tsouris, C., and S. Yiacoumi, "Particle Flocculation and Filtration by High-Gradient Magnetic Fields," *Separation Science and Technology*, **32**, 599-616 (1997).
26. Tsouris, C., S. H. Neal, V.M. Shah, M.A. Spurrier, and M.K. Lee, "Comparison of Liquid-Liquid Dispersions Formed by a Stirred Tank and Electrostatic Spraying," *Chemical Engineering Communications*, **160**, 175-197 (1997).
27. Kaufman, E.N., J.B. Harkins, M. Rodriguez, C. Tsouris, P.T. Selvaraj, and S.E. Murphy, "Development of an Electro-Spray Bioreactor for Crude Oil Processing," *Fuel Processing Technology*, **52**, 127-144 (1997).
28. Burns, S.E., S. Yiacoumi, and C. Tsouris, "Microbubble Generation for Environmental and Industrial Separations," *Separation and Purification Technology*, **11**, 221-232 (1997).
29. Shin, W.-T., S. Yiacoumi, and C. Tsouris, "Experiments on Electrostatic Dispersion of Air in Water," *Industrial and Engineering Chemistry Research*, **36**, 3647-3655 (1997).
30. Norato, M.A., C. Tsouris, and L.L. Tavlarides, "Phase Inversion Studies in Liquid-Liquid Dispersions," *The Canadian Journal of Chemical Engineers*, **76**, 486-494 (1998).

31. Tsouris, C., W.-T. Shin, and S. Yiacoumi " Pumping, Spraying, and Mixing of Fluids by Electric Fields," The Canadian Journal of Chemical Engineers, **76**, 589-599 (1998).
32. Chin, C.J., S. Yiacoumi, and C. Tsouris "Shear-Induced Flocculation of Colloidal Particles in Stirred Tanks," Journal of Colloid and Interface Science, **206**, 532-545 (1998).
33. Ying, T.-Y., C.J. Chin, S.-C. Lu, S. Yiacoumi, M.R. Chattin, M.A. Spurrier, D.W. DePaoli, and C. Tsouris "Magnetic-Seeding Filtration," Separation Science and Technology, **34**, 1371-1392 (1999).
34. Shin, W.-T., A. Mirmiran, S. Yiacoumi, and C. Tsouris "Ozonation Using Microbubbles Formed by Electric Fields," Separation and Purification Technology, **15**, 271-282 (1999).
35. Tsouris, C., A.P. Borole, and E.N. Kaufman, D.W. DePaoli "An Electrically Driven Gas-Liquid-Liquid Contactor for Bioreactor and Other Applications," Industrial and Engineering Chemistry Research, **38**, 1877-1883 (1999).
36. Subramaniam, K., S. Yiacoumi, and C. Tsouris "Effect of Copper And Cadmium Binding on Flocculation of Ferric Oxide Particles," Separation Science and Technology, **34**, 1301-1318 (1999).
37. Blankenship, K.D., D.W. DePaoli, J.O. Hylton, and C. Tsouris "Effect of Electrode Configurations on Phase Equilibria with Electric Fields," Separation and Purification Technology, **15**, 283-294 (1999).
38. Relle, S., S.B. Grant, and C. Tsouris, "Diffusional Coagulation of Superparamagnetic Particles in the Presence of an External Magnetic Field," Physica A, **270**, 427-443 (1999).
39. Blankenship, K.D., V.M. Shah, and C. Tsouris "Distillation under Electric Fields," Separation Science and Technology, **34**, 1393-1409 (1999).
40. Ying, T.-Y., S. Yiacoumi, and C. Tsouris "High-Gradient Magnetically Seeded Filtration," Chemical Engineering Science, **55**, 1101-1113 (2000).
41. Chin, C.J., S. Yiacoumi, C. Tsouris, S. Relle, and S.B. Grant, "Secondary Minimum Aggregation of Superparamagnetic Colloidal Particles," Langmuir, **16**, 3641-3650 (2000).
42. Tsouris, C., and J. Dong, "Effects of Electric Fields on Phase Inversion of Liquid-Liquid Dispersions," Chemical Engineering Science, **55**, 3571-3574 (2000).
43. Tsouris, C., W.-T. Shin, S. Yiacoumi, and D.W. DePaoli, "Electrohydrodynamic Velocity and Pumping Measurements in Water and Alcohols," Journal of Colloid and Interface Science, **229**, 335-345 (2000).
44. Shin, W.-T., S. Yiacoumi, C. Tsouris, and S. Dai, "A Pulseless Corona Discharge Process for the Oxidation of Organics in Water," Industrial and Engineering Chemistry Research, **39**, 4408-4414 (2000).
45. Subramaniam, K., S. Yiacoumi, and C. Tsouris, "Sorption of Copper by Inorganic Particles–Equilibrium, Kinetics, and Particle Interactions: Experimental," Colloids and Surfaces A, **177**, 133-146 (2001).
46. Tsouris, C., D.W. DePaoli, J.T. Shor, M.Z.-C. Hu, and T.-Y. Ying, "Electrocoagulation for Magnetic Seeding of Colloidal Particles," Colloids and Surfaces A, **177**, 223-233 (2001).
47. Walker, A.B., C. Tsouris, D. W. DePaoli, and K. T. Klasson, "Ozonation of Soluble Organics in Aqueous Solutions Using Microbubbles," Ozone Science and Engineering, **23**, 77-87 (2001).

48. Yang, K.-L., T.-Y. Ying, S. Yiacoumi, C. Tsouris, and E. S. Vittoratos, "Electrosorption of Ions from Aqueous Solutions by Carbon Aerogel: An Electrical Double-Layer Model," Langmuir, **17**, 1961-1969 (2001).
49. Dong, J., and C. Tsouris, "Phase Inversion of Liquid-Liquid Dispersions under Applied Electric Fields," Journal of Dispersion Science and Technology, **22**, 57-69 (2001).
50. Tsouris, C., K. D. Blankenship, J. Dong, and D. W. DePaoli, "Enhancement of Distillation Efficiency by Application of an Electric Field," Industrial and Engineering Chemistry Research, **40**, 3843-3847 (2001).
51. Chin, C.J., S. Yiacoumi, and C. Tsouris, "Probing DLVO Forces Using Interparticle Magnetic Forces: Transition from Secondary-Minimum Aggregation to Primary-Minimum Aggregation," Langmuir, **17**, 6065-6071 (2001).
52. Dong, J., V. F. de Almeida, and C. Tsouris, "Formation of Liquid Columns on Liquid-Liquid Interfaces under Applied Electric Fields," Journal of Colloid and Interface Science, **242**, 327-336 (2001).
53. Chin, C.J., S. Yiacoumi, and C. Tsouris, "Influence of Metal-Ion Sorption on Colloidal Surface Forces Measured by Atomic Force Microscopy," Environmental Science & Technology, **36**, 343-348 (2002).
54. Chin, C.J., S. Yiacoumi, and C. Tsouris, "Agglomeration of Magnetic Particles and Breakup of Magnetic Chains in Magnetorheological Fluids," Colloids and Surfaces A: Physicochemical and Engineering Aspects, **204**, 63-72 (2002).
55. Dong, J., V.F. de Almeida, and C. Tsouris, "Effects of Applied Electric Fields on Drop-Interface and Drop-Drop Coalescence," Journal of Dispersion Science & Technology, **23**, 155-166 (2002).
56. Ying, T.-Y., K.-L. Yang, S. Yiacoumi, and C. Tsouris, "Electrosorption of Ions from Aqueous Solutions by Nanostructured Carbon Aerogel," Journal of Colloid and Interface Science, **250**, 18-27 (2002).
57. Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Canonical Monte Carlo Simulations of the Fluctuating-Charge Molecular Water between Charged Surfaces," Journal of Chemical Physics, **117**, 337-345 (2002).
58. Ying, T.-Y., S. Yiacoumi, and C. Tsouris, "An Electrochemical Method for the Formation of Magnetite Particles," Journal of Dispersion Science & Technology, **23**, 569-576 (2002).
59. Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Monte Carlo Simulations of Electrical Double-Layer Formation in Nanopores," Journal of Chemical Physics, **117**, 8499-8507 (2002).
60. Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Proton Adsorption and Electrical Double-Layer Formation inside Charged Platinum Nanochannels," Nano Letters, **2**, 1433-1437 (2002).
61. West, O.R., C. Tsouris, L. Liang, S. Lee, and S.D. McCallum, "Negatively Buoyant CO₂-Hydrate Composite for Ocean Carbon Sequestration," AIChE Journal, **49**, 283-285 (2003).
62. Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Electrosorption Capacitance of Nanostructured Carbon Aerogel Obtained by Cyclic Voltammetry," Journal of Electroanalytical Chemistry, **540**, 159-167 (2003).
63. Li, X., E. W. Hagaman, C. Tsouris, and J.W. Lee, "Removal of Carbon Dioxide from Flue Gas by Ammonia Carbonation in the Gas Phase," Energy and Fuels, **17**, 69-74 (2003).

64. Vithayaveroj V., S. Yiacoumi, and C. Tsouris, "Modification of Surface Forces by Metal Ion Adsorption," Journal of Dispersion Science and Technology, **24**, 517-525 (2003).
65. Tsouris, C., C.T. Culbertson, D.W. DePaoli, S. C. Jacobson, V.F. de Almeida, and J. M. Ramsey, "Electrohydrodynamic Mixing in Microchannels," AIChE Journal, **49**, 2181-2186 (2003).
66. Benesch, T., S. Yiacoumi, and C. Tsouris, "Brownian Motion in Confinement," Physical Review E, **68**, 021401 (2003).
67. Lee, S., L. Liang, D.A. Riestenberg, O.R. West, C. Tsouris, and E.E. Adams, "CO₂ Hydrate Composite for Ocean Carbon Sequestration," Environmental Science & Technology, **37**, 3701-3708 (2003).
68. Tsouris, C. and J.V. Porcelli, "Process Intensification – Has Its Time Finally Come?" Chemical Engineering Progress, **99**, 50-55 (2003).
69. DePaoli, D.W., C. Tsouris, and M. Z.-C. Hu, "EHD Micromixing Reactor for Particle Synthesis," Powder Technology, **135-136**, 302-309 (2003).
70. Subramaniam, K., V. Vithayaveroj, S. Yiacoumi, and C. Tsouris, "Copper Uptake by Silica and Iron Oxide Under High Surface Coverage Conditions: Surface Charge and Sorption Equilibrium Modeling," Journal of Colloid and Interface Science, **268**, 12-22 (2003).
71. Tsouris, C., P. Brewer, E. Peltzer, P. Walz, D.A. Riestenberg, L. Liang, and O.R. West, "Hydrate Composite Particles for Ocean Carbon Sequestration: Field Verification," Environmental Science & Technology, **38**, 2470-2475 (2004).
72. Shin, W.-T., X. Garanzuay, S. Yiacoumi, C. Tsouris, B. Gu, and, K. Mahinthakumar "Soil-Ozone Interactions: Kinetics and Mathematical Simulation," Journal of Contaminant Hydrology, **72**, 227-243 (2004).
73. Riestenberg, D.A., E. Chiu, M. Gborigi, L. Liang, O. R. West, and C. Tsouris, "Investigation of Jet Breakup and Droplet Distribution on Liquid CO₂ and water systems – Implications for CO₂ Hydrate Formation for Ocean Carbon Sequestration," American Mineralogist, **89**, 1240-1246 (2004).

In Press

74. Shin, W.-T., S. Yiacoumi, and C. Tsouris, "Electric-Field Effects on Interfaces: Electrospray and Electrocoalescence," Current Opinion in Colloid and Interface Science, in press (2004).
75. Gabitto, J, D.A. Riestenberg, S. Lee, L. Liang, and C. Tsouris, "Ocean Disposal of CO₂: Conditions for Producing Sinking CO₂ Hydrate," Journal of Dispersion Science and Technology, in press (2004).
76. Benesch, T., S. Yiacoumi, and C. Tsouris, "Interaction of Colloidal Spheres Close to a Charged Plate," Journal of Dispersion Science and Technology, in press (2004).
77. Chin, C.J., S.-C. Lu, S. Yiacoumi, and C. Tsouris, "Fractal Dimension of Particle Aggregates in Magnetic Fields," Separation Science and Technology, in press (2004).
78. Aaron, D., and C. Tsouris, "Separation of CO₂ from Flue Gas: A Review," Separation Science and Technology, in press (2004).

79. Riahi-Nezhad, C.K., C. Tsouris, D.W. DePaoli, and V. F. de Almeida, "Removal of Micron-Size Droplets from an Air Stream by Means of Electric Fields," Separation Science and Technology, in press (2004).

PATENTS:

1. DePaoli, D.W., C. Tsouris, and J.Q. Feng, "Method of Electrically Producing Dispersions of Nonconductive Fluids into Conductive Fluids," Patent # 5,762,775 (1998).
2. Tsouris C., D.W. DePaoli, and J.T. Shor, "A Method to Electrolytically Produce High-Purity Magnetite Powder," Patent # 6,179,987 (2001).
3. DePaoli, D.W., M. Z.-C. Hu, and C. Tsouris, "Method for the Production of Ultrafine Particles by Electrohydrodynamic Micromixing," Patent # 6,265,025 (2001).
4. Tsouris C., and J. Dong, "Methods to Control Phase Inversions and Enhance Mass Transfer in Liquid-Liquid Dispersions," Patent # 6,495,617 (2002).
5. West, O.R., Tsouris, C., and Liang, L., "Method and Apparatus for Efficient Injection of CO₂ in Oceans," Patent # 6,598,407 (2003).
6. Tsouris, DePaoli, D.W., Culbertson, C.T., Jacobson, S.C., Ramsey, J.M., "Electrohydrodynamic Mixing on Microfabricated Devices," Invention Disclosure, submitted (2001).
7. West, O.R., Tsouris, C., and Liang, L., "Method for Continuous Production of a Hydrate Composite," Docket No. 0958.1 (2003).

CONFERENCE PROCEEDINGS (REFEREED):

1. Burns, S.E., Yiacoumi, S., Frost, J.D., and Tsouris, C., "Application of Digital Image Analysis for Size Distribution Measurements of Microbubbles," Proceedings of Engineering Foundation Conference on Imaging Technologies: Techniques and Applications in Civil Engineering, Davos, Switzerland, May 25-30, 1997, pp. 100-107, ASCE, 1998.
2. Subramaniam, K., Yiacoumi, S., and Tsouris, C., "A Unified Model for Ion Sorption Kinetics and Colloidal Particle Flocculation Rates," Proceedings of the Sixth International Conference on Fundamentals of Adsorption, Giens, France, May 24-28, 1998, 6 pp., Elsevier, 1998.

CONFERENCE PROCEEDINGS (NONREFEREED):

1. Tavlarides, L.L., C. Tsouris, H. Schmidt, J.C. Bonnet, and V.I. Kirou, "Development of a Model to Calculate Scaleup and Performance of Column Extractors," Proceedings of International Conference on Nuclear Fuel Reprocessing and Waste Management, Recod '87, Vol. 1, p. 323, Aug. 23-27, 1987, Paris, France.
2. Kirou, V.I., C. Tsouris, and L.L. Tavlarides, "Simulation and Control of a Multistage Stirred-Cell Column Extractor," ISEC '90, Solvent Extraction 1990, Part B, p. 1247-1252, Kyoto, Japan. 1990.
3. Tsouris, C., and L.L. Tavlarides, "Modeling and Control of Multistage Mixer Extractors," Proceedings of 7th European Conference on Mixing, Brugge, Belgium, September 1991, Koninklijke Vlaamse Ingenieursvereniging vzw. Part I, p. 491-496 (1991).

4. Tsouris, C., W. Shen, and L.L. Tavlarides, "Control of Extraction Columns," International Solvent Extraction Conference, York, UK, September 9-15, 1993, in Solvent Extraction in the Process Industries, Vol. 2, p. 1151-1158, Elsevier Applied Science, London, 1993.
5. Tsouris, C., and T.C. Scott, "Magnetic Flocculation of Paramagnetic Particles," First International Particle Technology Forum, Vol. 3, p. 243-248, August 17-19, 1994, Denver USA.
6. Shin, W.-T., S.E. Burns, S. Yiacoumi, and C. Tsouris, "Microbubbles Formed by Electric Fields and Current," in Emerging Technologies in Hazardous Waste Management VIII, I&EC Division Special Symposium, American Chemical Society, Birmingham, AL, September 9-11, p. 692-695, 1996.
7. Yiacoumi, S., C.J. Chin, T.-Y. Ying, C. Tsouris, D.W. DePaoli, M.R. Chattin, and M.A. Spurrier, "Magnetic Flocculation and Filtration," in Emerging Technologies in Hazardous Waste Management VIII, I&EC Division Special Symposium, American Chemical Society, Birmingham, AL, September 9-11, p. 687-690, 1996.
8. Tsouris, C., D.W. DePaoli, W-T. Shin, A. Mirmiran, S. Yiacoumi, and G.D. Duncan, "Innovative Concepts in Electrostatic Ozonation," AICHE Topical Conference on Separation Science and Technologies, pp. 572-576, Los Angeles, CA, November 16-21, 1997.
9. Tsouris, C., M.R. Chattin, M.A. Spurrier, D.W. DePaoli, T.-Y. Ying, S.-C. Lu, C.J. Chin, and S. Yiacoumi, "High-Gradient Magnetic Filtration for Environmental Applications," AICHE Topical Conference on Separation Science and Technologies, pp. 654-659, Los Angeles, CA, Nov. 16-21, 1997.
10. Burns, S.E., S. Yiacoumi, J.D. Frost, and C. Tsouris, "Application of Digital Image Analysis for Size Distribution Measurements of Microbubbles" Proceedings of Engineering Foundation Conference on Image Technologies: Techniques and Applications in Civil Engineering, Davos, ASCE, 100-107, 1998.
11. Subramaniam, K., S. Yiacoumi, and C. Tsouris, "A Unified Model for Ion Sorption Kinetics and Colloidal Particle Flocculation Rates," Sixth International Conference on Fundamentals of Adsorption, Giens, France, May 24-28, 1998.
12. Tsouris C., C.H. Byers, and S. Yiacoumi, "Charging Up Your Separations: Applications of Electrotechnologies," 1998 Corn Utilization & Technology Conference Proceedings, pp. 153-158, St. Louis, Missouri, June 1-3, 1998.
13. Subramaniam, K., S. Yiacoumi, and C. Tsouris, "Equilibria and Kinetics of Copper Sorption and Its Effects on Flocculation of Colloidal Oxide Particles," 220th American Chemical Society National Meeting, Washington, DC, August 19-24, 2 pp, 2000.
14. Chin, C.J., S. Yiacoumi, and C. Tsouris, "Aggregation of Colloidal Particles and Breakup of Aggregates," 220th American Chemical Society National Meeting, Washington, DC, August 19-24, 2 pp, 2000.
15. Subramaniam, K., S. Yiacoumi, and C. Tsouris, "Equilibria and Kinetics of Copper Sorption and Its Effects on Flocculation of Colloidal Oxide Particles," 220th American Chemical Society National Meeting, Preprints of Extended Abstracts, vol. 40, no. 2, 595-597, Washington, DC, August 19-24, 2000.
16. Chin, C.J., S. Yiacoumi, and C. Tsouris, "Influence of Metal Ion Sorption on Colloidal Surface Forces Measured by Atomic Force Microscopy," 222nd American Chemical Society National Meeting, Preprints of Extended Abstracts, vol. 41, no. 2, 288-290, Chicago, IL, August 26-30, 2001.

OTHER NONREFEREED PUBLICATIONS:

1. Tsouris, C., and D.W. DePaoli "Special Issue: Electroseparations; Guest editors' note," Separation and Purification Technology, **11**, 143-145 (1997).
2. Tsouris, C., K.R. Amarnath, and P.S. Fedkiw, "Special Issue: Electrochemical and Reactive Separations; Guest editors' note," Separation and Purification Technology, **15**, 193-196, 1999.
3. Yang, K.-L., S. Yiacoymi, and C. Tsouris, "Electrical Double Layer Formation at the Nanoscale," Encyclopedia of Nanoscience and Nanotechnology, Editors: J. A. Schwarz, C. Contescu, K. Putyera, Marcel Dekker, Inc., N.Y., 1001-1014 (2004).
4. Vithayaveroj V., S. Yiacoymi, and C. Tsouris, "Sorption of Metal Ions Studied by Atomic Force Microscopy: Effects of Solution Ionic Strength and Metal Concentration," Encyclopedia of Nanoscience and Nanotechnology, Editors: J. A. Schwarz, C. Contescu, K. Putyera, Marcel Dekker, Inc., N.Y., 169-178 (2004).

CONFERENCE PRESENTATIONS:

Tsouris, C., and L.L. Tavlarides, "Analytical Instrumentation for Measurements of Hydrodynamic Parameters and Concentrations of Dispersed Phase Systems," Symposium on Modeling of Industrial Reactors, AICHE Spring Meeting, Houston, TX 1989.

Tsouris, C., and L.L. Tavlarides, "Control of Extraction Columns," AICHE Annual Meeting, Chicago, IL, Nov. 11-16, 1990.

Tsouris, C., and L.L. Tavlarides, "Description of Transient Mixing Effects in a Multistage Extraction Column," Mixing XIII, Banff, Canada, June 11-16, 1991.

Tsouris, C., and L.L. Tavlarides, "Modeling and Control of Multistage Mixer Extractors," 7th European Congress on Mixing, Bruges, Belgium, Sep. 18-20, 1991.

Tsouris, C., and L.L. Tavlarides, "Description of Droplet Phenomena in Liquid Dispersions," AICHE Annual Meeting, Los Angeles, CA, Nov. 18-23, 1991.

Norato, M.A., C. Tsouris, and L.L. Tavlarides, "Phase Inversion Studies in Liquid Dispersions," AICHE Annual Meeting, Miami, FL, Nov. 1992.

Tsouris, C., T.C. Scott, and M.T. Harris, "Para- and Dia-magnetic Particle Flocculation in a Magnetic Field," Eighth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, Oct. 24-28, 1993.

Tsouris, C., and T.C. Scott, "Flocculation of Paramagnetic Particles in a Magnetic Field," AICHE Annual Meeting, St. Louis, MO, Nov. 17-22, 1993.

Tsouris, C., M.A. Norato, and L.L. Tavlarides, "An In-Situ Ultrasonic Volume Fraction Monitor for Application to Mixing Studies and Phase Inversion Detection in Stirred Vessel," AICHE Annual Meeting, San Francisco, CA, Nov. 13-18, 1994.

Tsouris, C., S. Yiacoumi, and T.C. Scott, "Magnetic Separation of Colloidal Paramagnetic Particles," AICHE Annual Meeting, San Francisco, CA, Nov. 13-18, 1994.

Tsouris, C., D.W. DePaoli, J.Q. Feng, O.A. Basaran, and T.C. Scott, "Electrostatic Spraying of Nonconductive Fluids into Conductive Fluids," AICHE Annual Meeting, San Francisco, CA, Nov. 13-18, 1994.

Tsouris, C., D.W. DePaoli, J.Q. Feng, and T.C. Scott, "Experiments on Electrostatic Dispersion of Drops and Bubbles," American Physical Society Meeting, Fluid Dynamics Division, Atlanta, GA, Nov. 20-22, 1994.

Tsouris, C., H.M. Lizama, M.A. Spurrier, T.L. Takeuchi, and T.C. Scott, "Bioreactor Systems for Liquid-Liquid Contacting," Seventeenth Symposium on Biotechnology for Fuels and Chemicals, Vail, CO, May 1995.

Tsouris, C., H.M. Lizama, M.A. Spurrier, T.L. Takeuchi, and T.C. Scott, "Liquid-Liquid Bioreactor Systems for Oil Desulfurization," MIXING XV, Banff, Canada, June 1995.

Tsouris, C., D.W. DePaoli, J.Q. Feng, and T.C. Scott, "Electrostatic Spraying of Gases into Liquids," MIXING XV, Banff, Canada, June 1995.

Tsouris, C., and S. Yiacoumi, "Particle Flocculation and Filtration by High-Gradient Magnetic Fields," Ninth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, Oct. 22-26, 1995.

Yiacoumi, S., D.A. Rountree, and C. Tsouris, "Particle Flocculation by Magnetic Seeding," AICHE Annual Meeting, Miami Beach, FL, Nov. 12-17, 1995.

Norato, M.A., C. Tsouris, and L.L. Tavlarides, "Phase Inversion Studies in Liquid-Liquid Dispersions," AICHE Annual Meeting, Miami Beach, FL, Nov. 12-17, 1995.

Tsouris, C., T.L. Takeuchi, and E.N. Kaufman, "Electrospray Bioreactor for Oil Desulfurization," AICHE Annual Meeting, Miami Beach, FL, Nov. 12-17, 1995.

Tsouris, C., D.W. DePaoli, X. Zhang, J.Q. Feng, and T.C. Scott, "Electric Fields in Multiphase Processing," AICHE Annual Meeting, Miami Beach, FL, Nov. 12-17, 1995.

Shin, W.-T., S.E. Burns, S. Yiacoumi, and C. Tsouris, "Methods of Bubble Generation in Environmental Processes," Quadrangle Conference, Georgia Institute of Technology, Atlanta, Georgia, February 23-25, 1996

Yiacoumi, S., and C. Tsouris, "Mechanism of Particle Flocculation by Magnetic Seeding," 70th Colloid and Surface Science Symposium, Clarkson University, Potsdam, NY, June 16-19, 1996.

Tsouris, C., D.W. DePaoli, W.-T. Shin and S. Yiacoumi, "Formation of Liquid-Liquid and Gas-Liquid Dispersions by Electric Fields," 70th Colloid and Surface Science Symposium, Clarkson University, Potsdam, NY, June 16-19, 1996.

Kaufman, E.N., J.B. Harkins, M. Rodriguez, P.T. Selvaraj, and C. Tsouris, "Electrically-Driven Bioreactors for Oil Desulfurization," AICHE Annual Meeting, Chicago, Nov. 10-15, 1996.

- Shin, W.-T., S.E. Burns, S. Yiaccoumi, and C. Tsouris, "Formation of Microbubbles by Electric Fields and Current," AICHE Annual Meeting, Chicago, Nov. 10-15, 1996.
- Tsouris, C., D.W. DePaoli, Z.-C. Hu, M.R. Chattin, M.A. Spurrier, S. Yiaccoumi, C.-J. Chin, and T.-Y. Ying, "Flocculation and Filtration of Paramagnetic Particles by Magnetic Fields," AICHE Annual Meeting, Chicago, Nov. 10-15, 1996.
- Tsouris, C., W.-T. Shin, and S. Yiaccoumi "Formation of Microbubbles Using Electric Fields for Environmental Applications," 71st Colloid and Surface Science Symposium, Newark, DL, June 29-July 2, 1997.
- Yiaccoumi, S., T.-Y. Ying, S.-C. Lu, C.J. Chin, and C. Tsouris "Flocculation and Filtration of Paramagnetic Colloidal Particles," 71st Colloid and Surface Science Symposium, Newark, DL, June 29-July 2, 1997.
- Yiaccoumi, S., K. Subramaniam, and C. Tsouris "Influence of Sorption Rates on Particle Flocculation Kinetics," 71st Colloid and Surface Science Symposium, Newark, DL, June 29-July 2, 1997.
- Yiaccoumi, S., T.-Y. Ying, C.J. Chin, S.-C. Lu, C. Tsouris, D.W. DePaoli, M.R. Chattin, and M. A. Spurrier "Magnetic-Seeding Filtration," Tenth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 20-24, 1997.
- Yiaccoumi, S., K. Subramaniam, and C. Tsouris "Effect of Sorption on Particle Flocculation Kinetics," Tenth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 20-24, 1997.
- Blankenship, K.D., V.M. Shah, and C. Tsouris "Distillation under Electric Fields," Tenth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 20-24, 1997.
- Ying, T.-Y., C.J. Chin, S. Yiaccoumi, C. Tsouris, and D.W. DePaoli "High-Gradient Magnetic Filtration for Environmental Applications," Quadrangle Conference, University of North Carolina, Chapel Hill, NC, January 30-February 1, 1998.
- Worden, R.M., M.D. Bredwell, and C. Tsouris, "Synthesis Gas Fermentations: Mass Transfer Improvement in Butyribacterium Methylothrophicum Fermentations," 20th Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, Tennessee, May 3-7, 1998.
- Tsouris, C. "Flocculation and Filtration of Particles by Magnetic Fields," Second International Conference on the Scientific and Clinical Applications of Magnetic Carriers, Cleveland, Ohio, May 28-30, 1998.
- Tsouris, C., W.-T. Shin, and S. Yiaccoumi "Ozonation Using Electrostatic Spraying," 72nd Colloid and Surface Science Symposium, The Pennsylvania State University, June 21-24, 1998.
- Yiaccoumi, S., K. Subramaniam, and C. Tsouris "Stability of Colloidal Particles during Metal Ion Uptake from Aqueous Solutions," 72nd Colloid and Surface Science Symposium, The Pennsylvania State University, University Park, June 21-24, 1998.
- Tsouris, C., D.W. DePaoli, J.T. Shor, M. Z-C. Hu, and T.-Y. Ying "Electrochemical Methods for Magnetic Seeding of Wastewaters," 72nd Colloid and Surface Science Symposium, The Pennsylvania State University, University Park, June 21-24, 1998.
- Tsouris, C., K.D. Blankenship, D.W. DePaoli, W.-T. Shin and J.O. Hylton "Electric-Field Effects on Gas-Liquid and Liquid-Liquid Systems," 72nd Colloid and Surface Science Symposium, The Pennsylvania State University, June 21-24, 1998.

Tsouris, C., V.M. Shah, K.D. Blankenship, D.W. DePaoli, J.O. Hylton, S. Yiacoumi, and T.-Y. Ying, "Phase Equilibria Modification by Electric Fields," EMSP Workshop, Chicago, Illinois, July 27-30, 1998.

Tsouris, C., T.-Y. Ying, C. J. Chin, and S. Yiacoumi, "Flocculation and Filtration in a Magnetic-Seeding Process," American Chemical Society Annual Meeting, Boston, MA, August 23-27, 1998.

Blankenship, K.D., D.W. DePaoli, J.O. Hylton, and C. Tsouris "Distillation With Applied Electric Fields," AIChE Annual Meeting, Miami, FL, November 15-20, 1998.

Yiacoumi, S., K. Subramaniam, and C. Tsouris, "Influence of Metal Ion Adsorption Equilibrium and Kinetics on the Aggregation of Colloidal Particles," AIChE Annual Meeting, Miami, FL, November 15-20, 1998.

Tsouris, C., C.J. Chin, S. Yiacoumi, S. Relle, and S.B. Grant, "Chain Formation of Superparamagnetic Particles in Magnetic Fields," AIChE Annual Meeting, Miami, FL, November 15-20, 1998.

Yiacoumi, S., K. Subramaniam, C.J. Chin, and C. Tsouris, "Changes in Particle Flocculation Behavior Due to Adsorption of Metal Ions from Aqueous Solutions," 217th American Chemical Society National Meeting, 2 pp., Anaheim, CA, March 21-25, 1999.

Tsouris, C., D. W. DePaoli, and S. Yiacoumi, "Novel Environmental Technologies Driven by Electric and Magnetic Fields," Environmental Technologies and Opportunities Forum, Oak Ridge, TN, June 1, 1999.

Chin, C.J., S. Yiacoumi, and C. Tsouris, " Aggregation of Superparamagnetic Particles and Breakup of Magnetic Aggregates," 73rd ACS Colloid and Surface Science Symposium, Massachusetts Institute of Technology, Cambridge, MA, June 13-16, 1999.

Tsouris, C., and J. Dong, " Electric-Field Effects on Fluid Interfaces," 73rd ACS Colloid and Surface Science Symposium, Massachusetts Institute of Technology, Cambridge, MA, June 13-16, 1999.

Yiacoumi, S., C. Tsouris, and D. W. DePaoli, "Novel Environmental Technologies Driven by Electric and Magnetic Fields," Association of Environmental Engineering and Science Professors (AEESP) Research Frontiers, The Pennsylvania State University, University Park, PA, July 31-August 3, 1999.

Tsouris, C., J. Dong, and D.W. DePaoli "Novel Phenomena in Liquid-Liquid Systems Under the Influence of Electric Fields," MIXING XVII, Banff, Canada, August 15-20, 1999.

Tsouris, C., D.W. DePaoli, W.-T. Shin, and S. Yiacoumi, "Electric-Field Effects on Fluids with Applications in Oxidation of Organic Compounds," MIXING XVII, Banff, Canada, August 15-20, 1999.

DePaoli, D.W., C. Tsouris, and M. Z.-C. Hu, "Electrohydrodynamic Mixing and Reaction in Multiphase and Miscible Systems," MIXING XVII, Banff, Canada, August 15-20, 1999.

Ying, T.-Y., S. Yiacoumi, C. Tsouris, J.T. Shor, D.W. DePaoli, "Electrocoagulation, Magnetic Seeding, and High-Gradient Magnetic Filtration," Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 17-20, 1999.

Dong, J, C. Tsouris, "A Novel Solvent Extraction Approach Using Electric Fields," Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 17-20, 1999.

Ying, T.-Y., K.-L. Yang, S. Yiacoumi, C. Tsouris, "Electrosorption of Metal Ions from Aqueous Solutions," Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 17-20, 1999.

Walker, A.B., C. Tsouris, D.W. DePaoli, and K.T. Klason, "Removal of Dissolved Organics from High Ionic Strength Aqueous Solutions Produced by the Oil Industry," Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 17-20, 1999.

Tsouris, C., K.D. Blankenship, J. Dong, D.W. DePaoli, "Distillation with Electric Fields," Eleventh Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, TN, October 17-20, 1999.

Yiacoumi, S., T.-Y., Ying, K.-L. Yang, C. Tsouris "Electrosorption of Metal Ions from Aqueous Solutions," AIChE Annual Meeting, Dallas, TX, October 31- November 5, 1999.

Tsouris, C., C.J. Chin, S.Yiacoumi, "Aggregation and Breakup of Colloidal Particles in Turbulent Flow," AIChE Annual Meeting, Dallas, TX, October 31- November 5, 1999.

Subramaniam, K., S. Yiacoumi, C. Tsouris "Copper Adsorption at Hematite- and Silica-Water Interfaces: Equilibria, Kinetics, and Effect on Particle Coagulation," AIChE Annual Meeting, Dallas, TX, October 31- November 5, 1999.

Dong, J., C. Tsouris "Effect of Electric Fields on Phase Inversion in Liquid-Liquid Dispersions," AIChE Annual Meeting, Dallas, TX, October 31- November 5, 1999.

Tsouris, C., DePaoli, D. W., Hu, M. Z.-C., and Yiacoumi, S. (2000) "Pumping, Spraying, and Mixing of Fluids by Electric Fields: Applications in Materials Synthesis and Water Treatment," 2000 FACSS Conference, September 24-29, Nashville, TN (INVITED).

Subramaniam, K., Yiacoumi, S., and Tsouris, C. (2000). "Copper Sorption and its Effects on Flocculation of Oxide Colloids: Equilibria and Rates," 220th American Chemical Society National Meeting, Washington, DC, August 19-24.

Yang, K.-L., Ying, T.-Y., Yiacoumi, S., Tsouris, C. (2000). "Electrosorption of Ions from Aqueous Solutions by Nanostructured Carbon Aerogel," Nanoscience and Nanotechnology, Georgia Institute of Technology, Atlanta, GA, October 16-18.

Chin, C.J., Yiacoumi, S., and Tsouris, C. (2000). "Primary- and Secondary-Minimum Aggregation of Superparamagnetic Colloidal Particles," Nanoscience and Nanotechnology, Georgia Institute of Technology, Atlanta, GA, October 16-18.

Dong, J., Tsouris, C., and de Almeida, V. F. (2000). "Drop Coalescence and Interfacial Instability Caused by Electric Fields," AIChE Annual Meeting, Los Angeles, CA, November 12-17.

Tsouris, C., and Dong, J. (2000). "Enhancement of Mass-Transfer Rates in Solvent Extraction by an Electric-Field Induced Phase-Inversion," AIChE Annual Meeting, Los Angeles, CA, November 12-17.

Ying, T.-Y., Yang, K.-L., Yiacoumi, S., Tsouris, C., and Vittoratos, E.S (2000). "Electrosorption of Ions from Aqueous Solutions by Carbon Aerogel," AIChE Annual Meeting, Los Angeles, CA, November 12-17.

Chin, C.J., Yiacoumi, S., and Tsouris, C. (2000). "Aggregation of Colloidal Particles and Breakup of Aggregates," AIChE Annual Meeting, Los Angeles, CA, November 12-17.

Tsouris, C., Dong, J. (2001). "Phase-Inversion Control of Liquid Dispersions by Electric Fields," Particles 2001, Orlando, FL, February 24-27 (INVITED).

Chin, C.J., Yiacoumi, S., and Tsouris, C. (2001). "Probing DLVO Forces Using Interparticle Magnetic Forces," 75th ACS Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13.

Yang, K.-L., Ying, T.-Y., Yiacoumi, S., Tsouris, C. (2001). "Electrical Double-Layer Formation in Porous Nanostructured Materials," 75th ACS Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13.

Tsouris, C., K.T. Klasson, S.A. Jones, M.D. Dinsmore, D.W. DePaoli, V. Vithayaveroj, and S. Z. Yiacoumi (2001). "Ozonation of Produced Water," 75th ACS Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13.

Tsouris, C., D.W. DePaoli, V. F. de Almeida, C. T. Culbertson, S. C. Jacobson, J. M. Ramsey (2001). "Microfluidic Transport Processes Driven by Electrohydrodynamic Flows," 75th ACS Colloid and Surface Science Symposium, Carnegie Mellon University, Pittsburgh, PA, June 10-13.

Tsouris, C., K.T. Klasson, S.A. Jones, M.A. Dinsmore, V. Vithayaveroj, S.Z. Yiacoumi, and D.W. DePaoli (2001). "Ozonation of Produced Water from Oil Production Wells," Twelveth Symposium on Separation Science and Technology for Energy Applications, Gatlinburg, Tennessee, October 15-18, 2001.

Chin, C.J., S. Yiacoumi, and C. Tsouris, "Measurements of Colloidal Forces Using an External Magnetic Field and Atomic Force Microscopy," AICHE Annual Meeting, Reno, NV, November 4-9, 2001.

Yang, K.-L., T.-Y. Ying, S. Yiacoumi, and C. Tsouris, "A Grand Canonical Monte Carlo Method to Describe Electrosorption by Porous Nanostructured Materials," AICHE Annual Meeting, Reno, NV, November 4-9, 2001.

Chin, C.J., V. Vithayaveroj, S. Yiacoumi, and Tsouris, C., "In-Situ Colloidal Surface Force Measurements during Sorption of Metal Ions by Atomic Force Microscopy," 76th ACS Colloid and Surface Science Symposium, University of Michigan, Ann Arbor, MI, June 23-26, 2002.

Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Monte Carlo Simulation of Electrical Double-layer Formation in Nanopores," 76th ACS Colloid and Surface Science Symposium, University of Michigan, Ann Arbor, MI, June 23-26, 2002.

Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Electrosorption Capacitance of Nanostructured Materials," 76th ACS Colloid and Surface Science Symposium, University of Michigan, Ann Arbor, MI, June 23-26, 2002.

Chin, C.J., V. Vithayaveroj, S. Yiacoumi, and Tsouris, C., "Atomic Force Microscopy Measurements of Colloidal Surface Forces during Sorption of Copper Ions," Boston, MA, August 19-24, 2002. (Invited Presentation).

Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Proton Adsorption and Electrical Double-Layer Formation inside Charged Platinum Nanochannels," AICHE Annual Meeting, Indianapolis, IN, November 3-8, 2002.

Yang, K.-L., S. Yiacoumi, and C. Tsouris, "Monte Carlo Simulation of Electrical Double-Layer Formation in Nanopores," AICHE Annual Meeting, Indianapolis, IN, November 3-8, 2002.

Tsouris, C., D.E Riestenberg, O.R. West, L. Liang, and S. Lee "Interfacial CO₂ Hydrate Formation Reaction in Seawater: An Ocean Carbon Sequestration Approach," AICHE Annual Meeting, Indianapolis, IN, November 3-8, 2002.

Lee, S., D.E. Riestenberg, O.R. West, L. Liang, C. Tsouris "CO₂ Ocean Sequestration by Forming a Negatively Buoyant Hydrate Composite," AIChE Annual Meeting, Indianapolis, IN, November 3-8, 2002.

Yang, K.-L., S. Yiacoumi, and C. Tsouris "Monte Carlo Simulations of Electrical Double-layer Formation in Nanopores," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Vithayaveroj, V., S. Yiacoumi, and C. Tsouris "Investigation of Metal Ion Adsorption Using Atomic Force Microscopy," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Taboada Serrano, P., S. Yiacoumi, and C. Tsouris "Study of Interparticle Forces in Asymmetric Electrolyte Solutions," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Benesch, T., S. Yiacoumi, and C. Tsouris "Brownian Motion in Confinement," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Benesch, T., S. Yiacoumi, and C. Tsouris "Interaction of Colloidal Spheres Close to a Charged Plate," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Tsouris, C., L. Liang, D.E. Riestenberg, O.R. West, S. Lee, E. Chiu, J. Gabitto, P. Brewer, E. Peltzer, E. Adams "Laboratory, Field, and Modeling Studies on a CO₂ Hydrate Composite for Ocean Carbon Sequestration," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

DePaoli, D.W., C. Tsouris, V.F. de Almeida, C.T. Culbertsong, S.C. Jacobson, J.M. Ramsey "Mixing in Microchannels," 77th ACS Colloid and Surface Science Symposium, Georgia Institute of Technology, Atlanta, GA, June 15-18, 2003.

Tsouris, C., Liang, L., Riestenberg, D., West, Lee, S., Gabitto, J., Brewer, P., Peltzer, E., Adams, E. "Laboratory, Field, and Modelling Studies of CO₂ Hydrate Composite Particles Formed by Direct Injection of CO₂ in the Ocean" 3rd Annual Conference on Carbon Sequestration, May 5-8 2003, Washington, D.C.

Tsouris, C., Liang, L., Riestenberg, D., West, O., Lee, S., Gabitto, J., Brewer, P., Peltzer, E., Adams, E. "Laboratory, Field, and Modelling Studies of a CO₂ Hydrate Composite for Ocean Carbon Sequestration" 77th ACS Colloid and Surface Science Symposium, June 15-18 2003, Atlanta, Ga.

Riestenberg, D., Chiu, E., Gborigi, M., Gabitto, J., Liang, L., West, O., Tsouris, C. "Jet Breakup Regimes in Liquid-Liquid Systems: Application to Ocean CO₂ Sequestration" AIChE Annual Meeting, November 16-21 2003, San Francisco, Ca.