

Avelino Eduardo Sáez
Curriculum Vitae

Current Position: Distinguished Professor
Department of Chemical and Environmental Engineering,
and Mel and Enid Zuckerman College of Public Health
University of Arizona, Tucson, AZ 85721
(at the University of Arizona since 1998)

E-mail: esaez@email.arizona.edu

Phone: (520) 6215369

Academics

1. Universidad Simón Bolívar, Caracas, Venezuela, B.Sc. in Chemical Engineer), July 1978.
2. University of California, Davis, Degree conferred: M.Sc. in Chemical Engineering, September 1981.
3. University of California, Davis, Degree conferred: Ph.D. in Chemical Engineering, June 1984.

Other Professional Experience

1. Departamento de Termodinámica y Fenómenos de Transferencia, Universidad Simón Bolívar, Caracas, Venezuela, Instructor: September 1978-March 1980.
2. Department of Chemical Engineering, North Carolina State University, Raleigh, Visiting Research Associate: July-December 1984.
3. Department of Physics, University of Bristol, Bristol, U.K., Visiting Research Associate with a Marie Curie fellowship granted by the European Community: January-December 1992.
4. Departamento de Termodinámica y Fenómenos de Transferencia, Universidad Simón Bolívar, Caracas, Assistant, Associate and Full Professor: 1985-1995.
5. Department of Chemical Engineering, North Carolina State University, Raleigh, Visiting Scholar and Research Associate Professor: October 1995-July 1998.
6. Visiting Scientist, Pacific Northwest National Laboratories, Richland, Washington, October 2005-March 2006.

Courses Taught

Undergraduate Level

At Universidad Simón Bolívar: Thermodynamics I and II, Transport Phenomena I (Fluid Mechanics), Heat Transfer I, Chemical Engineering Problems, Separation Processes II, Chemical Reactor Analysis.

At North Carolina State University: Transport Processes II.

At The University of Arizona: Chemical Engineering Mass Transfer, Heat Transfer and Fluid Flow, Transport Phenomena, Unit Operations Laboratory, Elements of Chemical Engineering II, Rheology: Principles and Applications, Chemical Engineering Laboratory, Chemical Engineering Modeling, Environment and Human Rights.

Graduate Level

At Universidad Simón Bolívar: Fluid Mechanics, Advanced Chemical Engineering Analysis, Approximate Methods in Engineering, Transport Phenomena in Porous Media, Transport Phenomena in Continua, Rheology of Polymer Solutions.

At North Carolina State University: Transport Phenomena I.

At The University of Arizona: Advanced Chemical Engineering Transport Phenomena, Rheology: Principles and Applications, Environmental Transport Processes, Advanced Engineering Analysis.

Honors and Awards

1. Mention cum laude in B.Sc. diploma, Universidad Simón Bolívar, 1978.
2. Award for Academic Excellence, conferred by Atlantic Richfield Company, University of California, Davis, 1981.
3. Award José Francisco Torrealba, conferred by the Association of Faculty Members, Universidad Simón Bolívar, for achievements in research, 1995.
4. Award Manuel Noriega Morales in the area of Applied Science and Technology, conferred by the Organization of American States, Washington, 1995. The award was conferred for contributions in the area of transport phenomena in porous media and multiphase flow.
5. Annual Award for Excellence at the Student Interface, College of Engineering, University of Arizona, 2000, 2002-2006, 2008-2012.
6. Outstanding Faculty Member, Graduate Student Achievement Awards, The University of Arizona, 2004.
7. Graduate and Professional Education Teaching and Mentoring Award, The University of Arizona, 2006.
8. Outstanding Faculty Member, The University of Arizona Accolades, 2010.
9. Distinguished Professor, since 2011.
10. ASEE Pacific Southwest Educator of the Year Award, 2013.

Publications

Articles in Conference Proceedings, Limited Circulation Journals, and Book Chapters

1. O'Laoghaire, D.T. and A.E. Sáez, An Analysis of the Capacity Expansion Problem for a Water Quality Management System, *Acta Científica Venezolana*, **30**, 105-115 (1979).
2. Solari, R.B., A.E. Sáez and C.A. Castillo, Distillation Columns Optimization by a Faster Convergence Procedure, *Revista Técnica INTEVEP (Venezuela)*, **2**, 121-129 (1982).
3. Levec, J., A.E. Sáez and R.G. Carbonell, Holdup and Pressure Drop in Trickle-Bed Reactors, in *Institution of Chemical Engineers Symposium Series No.87*, London, pp.185-194, 1984.
4. Levec, J., A.E. Sáez and R.G. Carbonell, Holdup and Pressure Drop in Trickle-Bed Reactors, *Chemistry and Industry*, **34**, 21-24 (1985).
5. Otero, C., A.E. Sáez and I. Rusinek, Calculation of Absolute Permeabilities for Simulation Gridblocks with Shale Intercalations, in *II International Symposium on Enhanced Oil Recovery. Technical Works*, Vol. II, EDILUZ, Maracaibo, Venezuela, pp. 101-117, 1987.
6. Otero, C., A.E. Sáez and I. Rusinek, Effective Permeabilities for Heterogeneous Reservoirs, in *Proceedings of the 4th. European Symposium on Enhanced Oil Recovery*, DGMK, Hamburg, pp. 1019-1029, 1987.
7. Rodríguez-Prada, H.A. and A.E. Sáez, A Boundary Element Solution of the Stream Function-Vorticity Formulation of the Navier-Stokes Equations, in *Numerical Methods in Laminar and Turbulent Flow*, C. Taylor, W.G. Habashi and M.M. Hafez (eds.), Vol. V, Pineridge Press, Swansea, pp.312-323, 1987.
8. Sáez, A.E., Mathematical Model for the Simulation of Water Quality in River Networks, *Acta Científica Venezolana*, **39**, 294-303 (1988).
9. Müller A.J., A.E. Sáez, S. Rodríguez, C. Romero and M.L. Sargenti, Flow of Polymer Solutions through Porous Media: Influence of the Flow Distribution, in *Proceedings of the Iberoamerican Polymer Symposium*, Vigo, Spain, pp. 155-156, 1992.
10. Rodríguez, S., C. Romero, M.L. Sargenti, A.E. Sáez and A.J. Müller, The Flow of Poly(Ethylene

Oxide) Solutions through Nonconsolidated Porous Media, in Proceedings of the 3rd. Latin American Symposium on Polymers, Caracas, pp. 451-459, 1992.

11. Müller, E.A., A.E. Sáez and I. Rusinek, Calculation of Effective Absolute Permeabilities in Cross-Bedding Stratified Reservoirs, Latin American Applied Research, **22**, 41-48 (1992).

12. Müller, A.J., A.E. Sáez, S. Rodríguez, C. Romero and M.L. Sargenti, Flowing Polymers through Porous Media: Effects of Flow Distribution, in 3rd. Pan American Congress of Applied Mechanics. Proceedings, São Paulo, Brazil, pp. 323-326, 1993.

13. Gamboa, A.C., A.J. Müller and A.E. Sáez, Porous Media Flow of Blends of Semi-Rigid and Flexible Polymers in Solution, in Progress and Trends in Rheology IV: Proceedings of the Fourth European Rheology Conference, C. Gallegos (ed.), Steinkopff, Darmstadt, pp. 157-159, 1994.

14. Müller, A.J., A.C. Gamboa and A.E. Sáez, Flow of Solutions of Flexible and Semi-Flexible Polymers and their Blends through Porous Media, in Proceedings of the 4th Latin-American Polymer Symposium, Gramado, Brazil, pp. 372-379, 1994.

15. Gómez, M.G., F.F. Pironti and A.E. Sáez, Hydrodynamics and Mass Transfer in a Bubble Column with a Non-Newtonian Fluid, in Proceedings of the 5th. Latin-American Congress on Heat and Mass Transfer, Caracas, pp. IID.23.1- IID.23.12, 1994.

16. Da Silva, F.A., F.F. Pironti and A.E. Sáez, Distribution Of Solid Phase In Upward Gas-Liquid-Solid Flow through Conical Columns, in Proceedings of the 5th Thermal Sciences Brazilian Meeting, São Paulo, pp. 475-478, 1994.

17. Da Silva, F.A., L. Medina, O. Pérez-Martín, A.J. Müller and A.E. Sáez, Flow of Polymer Solutions through a Bidimensional Porous Medium, in Applied Mechanics in the Americas. Vol. III, L.A. Godoy, S.R. Idelsohn, P.A. Laura, D.T. Mook (eds.), American Academy of Mechanics, Buenos Aires, pp. 295-300, 1995.

18. Müller, A.J., A.E. Sáez, J.C. Tatham and J.A. Odell, Transition to Turbulence in Opposed Jets: Effect of Polymeric Additives, in Applied Mechanics in the Americas. Vol.III, L.A. Godoy, S.R. Idelsohn, P.A. Laura, D.T. Mook (eds.), American Academy of Mechanics, Buenos Aires, pp. 320-324, 1995.

19. Pironti, F.F., J. Fernández, R. Jiménez and A.E. Sáez, Numerical Prediction of Pressure Drops in Banks of Circular and Elliptical Tubes, in Proceedings of The Sixth FIDAP Users Conference, Fluid Dynamics International, Chicago, pp. 14.1-14.25, 1995.

20. Sáez, A.E. and A.J. Müller, Extension Thickening Effects in the Flow of Polymer Solutions through Porous Media, in Proceedings of the USB 25th Anniversary Polymer Meeting, Universidad Simón Bolívar, Caracas, pp. 63-74, 1995.

21. Sáez, A.E., M.L. Sargenti and A.J. Müller, Flow of Polymer Solutions through Disordered Packings of Mixtures of Monodisperse Spheres, in Proceedings of the XIIth International Congress on Rheology, A. Ait-Kadi, J.M. Dealy, D.F. James and M.C. Williams (eds.), Quebec City, p. 206, 1996.

22. Müller, A.J., R. Moreno, M. Rando, L. Smitter, P. Socías and A.E. Sáez, Extensional Flow of Solutions of Polymer Mixtures, in Proceedings of the XIIth International Congress on Rheology, A. Ait-Kadi, J.M. Dealy, D.F. James and M.C. Williams (eds.), Quebec City, p. 213, 1996.

23. Gestoso, P., A.J. Müller and A.E. Sáez, Two-Dimensional Flow of Newtonian and Non-Newtonian Fluids through Porous Media, in Proceedings of the XIIth International Congress on Rheology, A. Ait-Kadi, J.M. Dealy, D.F. James and M.C. Williams (eds.), Quebec City, pp. 377-378, 1996.

24. Moreno, R.A., A.J. Müller and A.E. Sáez, Mechanical Degradation of Polyacrylamide Solutions in Flow through Porous Media, in Proceedings of the III Venezuelan Congress in Chemistry, Universidad Central de Venezuela, Caracas, pp. 28-29, 1996.

25. Ventura-Medina, E., A.E. Sáez and F.F. Pironti, Liquid Mixing in a Concentric-Tube Bubble Column in Three-Phase Operation, in Proceedings of the 6th Latin American Congress on Heat and Mass Transfer, Florianopolis, Brazil, pp. 1309-1313, 1996.

26. Ramírez, N.E., J.B. Bello and A.E. Sáez, Mathematical Model for the Transport of Solids in Horizontal Pipes by Polymer Solutions, in Proceedings of the 6th Latin American Congress on Heat and

Mass Transfer, Florianopolis, Brazil, pp. 1405-1410, 1996.

27. Siquier, S., A. Ronchetti, M. Calderón, P. Llaguno and A.E. Sáez, Phase Distribution in Three-Phase Flows in Slurry Bubble Columns with a Conical Section, in Proceedings of the 6th Latin American Congress on Heat and Mass Transfer, Florianopolis, Brazil, pp. 1411-1416, 1996.

28. Moreno, R.A., A.J. Müller and A.E. Sáez, Degradation of Hydrolyzed Polyacrylamide in Porous Media Flows, in Proceedings of the 5th Latin American Polymer Symposium, Mar del Plata, Argentina, pp. 427-428, 1996.

29. Müller, A.J., R. Moreno and A.E. Sáez, Flow Induced Degradation in the Flow of Polymer Solutions through Porous Media, in Proceedings of the 5th Pan American Congress of Applied Mechanics, L.A. Godoy, M. Rysz, L.E. Suárez (eds.), University of Iowa Press, 1997.

30. Littlejohn, F., A.E. Sáez and C.S. Grant, Cleaning of Hydroxyapatite/Brushite Deposits from Stainless Steel Using a Sequestering Agent, in Fouling and Cleaning in Food Processing '98, D.I. Wilson, P.J. Fryer, A.P.M. Hasting (eds.), European Commission, Brussels, Belgium, pp. 214-221, 1999.

31. Hernández, B., Z. Aza, S. Siquier and A.E. Sáez, Monodisperse Solids Distribution in a Three-Phase Bubble Column, in EQUIFASE 99 Proceedings, J. Tojo, A. Arce (eds.), Vigo, Spain, pp. 331-338, 1999.

32. Müller, A.J. and A.E. Sáez, The Rheology of Polymer Solutions in Porous Media, in Flexible Polymer Chain Dynamics in Elongational Flow: Theory and Experiment, T.Q. Nguyen and H.-H. Kausch (eds.), Springer-Verlag, Heidelberg, pp. 335-393, 1999.

33. Müller, A.J., Y. Garcés, L. Patruyo, M. Torres, N. Ramírez and A.E. Sáez, The Flow and Surfactants and Polymer Solutions through Complex Flow Fields, Proceedings of the 5th Latin American and Caribbean Congress on Fluid Mechanics, Caracas, 2001.

34. Evans, R., A. Quach, D. Birnie, A.E. Sáez, W.P. Ela, B.J.J. Zelinski, G. Xia and H. Smith, Development of Polymeric Waste Forms for the Encapsulation of Toxic Wastes Using an Emulsion-Based Process, U.S. Department of Energy Journal of Undergraduate Research, **3**, 56-63 (2003).

35. Franks, C.J., A.P. Quach, G. Smith, H. Smith, D.P. Birnie, W. Ela, A.E. Sáez, B.J. Zelinski, Separation & Fixation of Toxic Components in Salt Brines Using a Water-Based Process, U.S. Department of Energy Journal of Undergraduate Research, **4**, 91-97 (2004).

36. Zelinski, B.J., R. Evans, A. Quach, D.P. Birnie, W.P. Ela, A.E. Sáez, G. Smith, H. Smith and G. Xia, Microstructure of Emulsion-Based Polymeric Waste Forms for Encapsulating Low-Level, Radioactive and Toxic Metal Wastes, Ceramic Transactions, **155**, 331-340 (2004).

37. Quach, A., G. Xia, R. Evans, A.E. Sáez, B.J. Zelinski, H. Smith, G. Smith, D.P. Birnie and W.P. Ela, Leach Resistance of Encapsulated Salts in Polymeric Waste Forms Fabricated Using an Aqueous-Based Route, Ceramic Transactions, **155**, 341-349 (2004).

38. Rengifo F., B. Garbo, A.P. Quach, W.P. Ela, A.E. Sáez, C. Franks, B.J. Zelinski, D.P. Birnie, G. Smith and H. Smith, Stabilization of Arsenic-Bearing Iron Hydroxide Solid Wastes in Polymeric Matrices, Ceramic Transactions, **168**, 99-108 (2005).

39. Rojas, M.R., C.E. Mendoza, S. Siquier, N. Ramírez, A.J. Müller and A.E. Sáez, Transport of Solids in a Non-Newtonian Annular Vertical Flow of Biopolymer Solutions, Engineering UCV Technical Journal (Venezuela), **21**, 57-69 (2006).

40. De Las Casas, C.L., K.G. Bishop, L.M. Bercik, M. Johnson, M. Potzler, W.P. Ela, A.E. Sáez, S.G. Huling and R.G. Arnold, In-Place Regeneration of Granular Activated Carbon Using Fenton's Reagents, in Innovative Approaches for the Remediation of Subsurface-Contaminated Hazardous Waste Sites: Bridging Flask and Field Scales, ACS Symposium Series, **940**, 43-65 (2006).

41. Rojas, M.R., O. Andara, A.J. Müller, S. Siquier, N. Ramírez and A.E. Sáez, Transport of Solids in Solutions of Biopolymer Mixtures and Improvements to their Distribution in a Flow Simulator in Vertical Conduits with Annular Cross Section, Engineering UCV Technical Journal (Venezuela), **23**, 43-51 (2008).

42. Rojas, M.R. and A.E. Sáez, Analysis of the Horizontal Pipeline Flow of Settling Dense Slurries, Proceedings of the 2010 International Conference on Multiphase Flow, University of Florida, 2010.

43. Blowers, P., J.A. Field, K. Ogden, A.E. Sáez and R. Sierra, ChE at The University of Arizona, *Chemical Engineering Education*, **45**, 2-7 (2011).

Articles in Journals

1. Solari, R.B., A.E. Sáez, I. D'Apollo and A. Bellet, Velocity Distributions and Liquid Flow Patterns in Industrial Sieve Trays, *Chemical Engineering Communications*, **13**, 369-384 (1982).

2. Sáez, A.E. and B.J. McCoy, Dynamic Response of a Packed-Bed Thermal Storage System - A Model for Solar Air Heating, *Solar Energy*, **29**, 201-206 (1982).

3. Sáez, A.E. and B.J. McCoy, Transient Analysis of Packed-Bed Thermal Storage Systems, *International Journal of Heat and Mass Transfer*, **26**, 49-54 (1983).

4. Sáez, A.E. and R.G. Carbonell, Hydrodynamic Parameters for Gas-Liquid Cocurrent Flow in Packed Beds, *AIChE Journal*, **31**, 52-62 (1985).

5. Sáez, A.E. and R.G. Carbonell, On the Performance of Quadrilateral Finite Elements in the Solution to the Stokes Equations in Periodic Structures, *International Journal for Numerical Methods in Fluids*, **5**, 601-614 (1985).

6. Sáez, A.E., R.G. Carbonell and J. Levec, The Hydrodynamics of Trickle Flow in Packed Beds. Part I: Conduit Models, *AIChE Journal*, **32**, 353-368 (1986).

7. Levec, J., A.E. Sáez and R.G. Carbonell, The Hydrodynamics of Trickle Flow in Packed Beds. Part II: Experimental Observations, *AIChE Journal*, **32**, 369-380 (1986).

8. Sáez, A.E. and R.G. Carbonell, The Equilibrium Shape and Stability of Menisci Formed between Two Touching Cylinders, *Journal of Fluid Mechanics*, **176**, 357-378 (1987).

9. Sáez, A.E., C. Otero and I. Rusinek, The Effective Homogeneous Behavior of Heterogeneous Porous Media, *Transport in Porous Media*, **4**, 213-238 (1989).

10. Rodríguez-Prada, H.A., F.F. Pironti and A.E. Sáez, Fundamental Solutions of the Stream Function-Vorticity Formulation of the Navier-Stokes Equations, *International Journal for Numerical Methods in Fluids*, **10**, 1-12 (1990).

11. Pino, L.Z., M.M. Yépez, A.E. Sáez and G. De Drago, An Experimental Study of Gas Holdup in Two-Phase Bubble Columns with Foaming Liquids, *Chemical Engineering Communications*, **89**, 155-175 (1990).

12. Ramírez, N.E. and A.E. Sáez, The Effect of Variable Viscosity on Boundary-Layer Heat Transfer in a Porous Medium, *International Communications in Heat and Mass Transfer*, **17**, 477-488 (1990).

13. Otero, C., A.E. Sáez and I. Rusinek, Effective Permeabilities for Model Heterogeneous Porous Media, *In Situ*, **14**, 229-244 (1990).

14. Pino, L.Z., M.M. Yépez, and A.E. Sáez, Hydrodynamics of a Semibatch Slurry Bubble Column with a Foaming Liquid, *AIChE Journal*, **36**, 1758-1762 (1990).

15. Sáez, A.E. and R.G. Carbonell, The Equilibrium and Stability of Menisci between Touching Spheres under the Effect of Gravity, *Journal of Colloid and Interface Science*, **140**, 408-418 (1990).

16. Sáez, A.E., J.C. Perfetti and I. Rusinek, Prediction of Effective Diffusivities in Porous Media Using Spatially Periodic Models, *Transport in Porous Media*, **6**, 143-157 (1991).

17. Siquier, S., M.M. Yépez and A.E. Sáez, Solid Distribution in a Slurry Bubble Column with Two Immiscible Liquid Phases, *AIChE Journal*, **37**, 466-469 (1991).

18. Estévez, L.A., L.Z. Pino, I. Cavicchioli and A.E. Sáez, Effect of Surfactant Concentration on Gas Holdup in a Bubble Column with an Organic Liquid, *Chemical Engineering Communications*, **105**, 231-239 (1991).

19. Sáez, A.E., M.M. Yépez, C. Cabrera and E. Soria, Static Liquid Holdup in Packed Beds of Spherical Particles, *AIChE Journal*, **37**, 1733-1736 (1991).

20. Pino, L.Z., R.B. Solari, S. Siquier, L.A. Estévez, M.M. Yépez and A.E. Sáez, Effect of Operating Conditions on Gas Holdup in Slurry Bubble Columns with a Foaming Liquid, *Chemical Engineering Communications*, **117**, 367-382 (1992).

21. Argüelles, C., M.M. Yépez and A.E. Sáez, Hydrodynamics of Bubble Columns with Two

- Immiscible Liquid Phases, *Chemical Engineering Communications*, **122**, 201-212 (1993).
22. Rodríguez, S., C. Romero, M.L. Sargenti, A.J. Müller, A.E. Sáez and J.A. Odell, Flow of Polymer Solutions through Porous Media, *Journal of Non-Newtonian Fluid Mechanics*, **49**, 63-85 (1993).
 23. Müller, A.J., L.I. Medina, O. Pérez-Martín, S. Rodríguez, C. Romero, M.L. Sargenti and A.E. Sáez, Flowing Polymers through Porous Media: an Experimental Study of Flow Distribution, Polymer Degradation and Molecular Weight Effects, *Applied Mechanics Reviews*, **46**, S63-S70 (1993).
 24. Sáez, A.E. and N.E. Ramírez, Boundary Layer Flow and Heat Transfer in Saturated and Unsaturated Porous Media, *European Journal of Mechanics B/Fluids*, **12**, 701-727 (1993).
 25. Müller, A.J., V. Balsamo, F. Da Silva, C.M. Rosales and A.E. Sáez, Shear and Elongational Behavior of Linear Low Density and Low Density Polyethylene Blends from Capillary Rheometry, *Polymer Engineering & Science*, **34**, 1455-1463 (1994).
 26. Sáez, A.E., A.J. Müller and J.A. Odell, Flow of Monodisperse Polystyrene Solutions through Porous Media, *Colloid and Polymer Science*, **272**, 1224-1233 (1994).
 27. Gamboa, A.C., A.E. Sáez and A.J. Müller, Flow of Solutions of Hydroxypropyl Guar - Poly(Ethylene Oxide) Mixtures through a Porous Medium, *Polymer Bulletin*, **33**, 717-724 (1994).
 28. Pino, L.R.Z. and A.E. Sáez, Thermal Dispersion in Vertical Gas-Liquid Flow with Foaming and Non-Foaming Liquids, *International Communications in Heat and Mass Transfer*, **22**, 391-400 (1995).
 29. Müller, A.J., A.E. Sáez and J.A. Odell, Turbulence Suppression by Polymer Solutions In Opposed Jets Flow, *AIChE Journal*, **41**, 1333-1336 (1995).
 30. Tatham, J.P., S. Carrington, J.A. Odell, A.C. Gamboa, A.J. Müller and A.E. Sáez, Extensional Behavior of Hydroxypropyl Guar Solutions: Optical Rheometry in Opposed Jets and Flow through Porous Media, *Journal of Rheology*, **39**, 961-986 (1995).
 31. Da Silva, F.A., F.F. Pironti and A.E. Sáez, The Sedimentation-Dispersion Model for Slurry Bubble Columns with a Conical Distributor, *Chemical Engineering Communications*, **138**, 157-170 (1995).
 32. Müller, A.J., A.E. Sáez, J.P. Tatham and J.A. Odell, Effect of Polymeric Additives on Turbulent Flow in Opposed Jets, *Applied Mechanics Reviews*, **48**, S216-S221 (1995).
 33. Pironti, F.F., V.R. Medina, R. Calvo and A.E. Sáez, Effect of Draft Tube Position on the Hydrodynamics of a Draft Tube Slurry Bubble Column, *The Chemical Engineering Journal*, **60**, 155-160 (1995).
 34. Bello, J.B., A.J. Müller and A.E. Sáez, Effect of Intermolecular Cross Links on Drag Reduction by Polymer Solutions, *Polymer Bulletin*, **36**, 111-118 (1996).
 35. Gómez, M.G., Z. Alarcón, E. Parra, S. Siquier, F. Pironti and A.E. Sáez, Hydrodynamics of Semibatch Slurry Bubble Columns with Polymer Solutions, *Chemical Engineering Science*, **51**, 2739-2744 (1996).
 36. Alarcón, Z., E. Parra, M.G. Gómez, S. Siquier and A.E. Sáez, Phase Distributions in Semibatch Slurry Bubble Columns with Guar Gum Solutions, *Chemical Engineering Science*, **51**, 3367-3371 (1996).
 37. Grosser, K., R.G. Carbonell, A. Cavero and A.E. Sáez, Lateral Thermal Dispersion in Gas-Liquid Cocurrent Downflow through Packed Beds, *AIChE Journal*, **42**, 2977-2983 (1996).
 38. Moreno, R.A., A.J. Müller and A.E. Sáez, Flow-Induced Degradation of Hydrolyzed Polyacrylamide in Porous Media, *Polymer Bulletin*, **37**, 663-670 (1996).
 39. Kabin, J.A., A.E. Sáez, C.S. Grant and R.G. Carbonell, Removal of Organic Films from Rotating Disks Using Aqueous Solutions of Nonionic Surfactants: Film Morphology and Cleaning Mechanisms, *Industrial & Engineering Chemistry Research*, **35**, 4513-4525 (1996).
 40. Dyakonova, N.E., J.A. Odell, Yu.V. Brestkin, A.V. Lyulin and A.E. Sáez, Macromolecular Strain in Periodic Models of Porous Media Flows, *Journal of Non-Newtonian Fluid Mechanics*, **67**, 285-310 (1996).
 41. Yan, J -F., A.E. Sáez and C.S. Grant, The Removal of Oil Films from Stainless Steel Tubes, *AIChE Journal*, **43**, 251-259 (1997).
 42. Siquier, S., A. Ronchetti, M. Calderón, P. Llaguno and A.E. Sáez, Spatial Distribution of Gas and Solid Phases in Conical Slurry Bubble Columns, *Chemical Engineering Communications*, **159**, 173-190

(1997).

43. Carrington, S., J.P. Tatham, J.A. Odell and A.E. Sáez, Macromolecular Dynamics in Extensional Flows: 1. Birefringence and Viscometry, *Polymer*, **38**, 4151-4164 (1997).

44. Carrington, S., J.P. Tatham, A.E. Sáez and J.A. Odell, Macromolecular Dynamics in Extensional Flows: 2. The Evolution of Molecular Strain, *Polymer*, **38**, 4595-4607 (1997).

45. Müller, A.J., L.G. Patruyo, W. Montano, D. Roversi-M, R. Moreno, N.E. Ramírez and A.E. Sáez, Mechanical Degradation of Polymers in Flows through Porous Media: Effect of Flow Path Length and Particle Size, *Applied Mechanics Reviews*, **50**, S149-S155 (1997).

46. Ventura-Medina, E., F.F. Pironti and A.E. Sáez, Liquid Phase Mixing in a Slurry Bubble Column with Draft Tube, *Chemical Engineering Communications*, **163**, 219-231 (1998).

47. Sáez, A.E., M.A. Márquez, G.W. Roberts and R.G. Carbonell, Hydrodynamic Model for Gas-Lift Reactors, *AIChE Journal*, **44**, 1413-1423 (1998).

48. Littlejohn, F., A.E. Sáez and C.S. Grant, Use of Sodium Polyaspartate for the Removal of Hydroxyapatite/Brushite Deposits from Stainless Steel Tubing, *Industrial & Engineering Chemistry Research*, **37**, 2691-2700 (1998).

49. Kabin, J.A., S.L. Tolsted, A.E. Sáez, C.S. Grant and R.G. Carbonell, Removal of Organic Films from Rotating Disks Using Aqueous Solutions of Nonionic Surfactants: Effect of Surfactant Molecular Structure, *Journal of Colloid and Interface Science*, **206**, 102-111 (1998).

50. Colberg, M.T., K. Carnes, A.E. Sáez, C.S. Grant, K. Hutchison and D. Hesterberg, Hydration and Removal of Supported Phospholipid Films in Aqueous Surfactant Solutions, *Thin Solid Films*, **327-329**, 247-251 (1998).

51. Márquez, M.A., A.E. Sáez, R.G. Carbonell and G.W. Roberts, Coupling of Hydrodynamics and Chemical Reaction in Gas-Lift Reactors, *AIChE Journal*, **45**, 410-423 (1999).

52. Kabin, J.A., A.E. Sáez, C.S. Grant and R.G. Carbonell, Removal Rates of Major and Trace Components of an Organic Film Using Aqueous Nonionic Surfactant Solutions, *Industrial & Engineering Chemistry Research*, **38**, 683-691 (1999).

53. Kauser, N., L. Dos Santos, M. Delgado, A.J. Müller and A.E. Sáez, Flow of Mixtures of Poly(Ethylene Oxide) and Hydrolyzed Polyacrylamide Solutions through Porous Media, *Journal of Applied Polymer Science*, **72**, 783-795 (1999).

54. Da Rocha, C.M., L.G. Patruyo, N.E. Ramírez, A.J. Müller and A.E. Sáez, Porous Media Flow of Poly(Ethylene Oxide)/Sodium Dodecyl Sulfate Mixtures, *Polymer Bulletin*, **42**, 109-116 (1999).

55. Colberg, M.T., A.E. Sáez, C.S. Grant, K. Hutchison and D. Hesterberg, Dynamic Hydration of Phospholipid Films in Aqueous Environments, *Colloids and Surfaces A: Physicochemical & Engineering Aspects*, **151**, 483-495 (1999).

56. Márquez, M.A., R.J. Amend, R.G. Carbonell, A.E. Sáez and G.W. Roberts, Hydrodynamics of Gas-Lift Reactors with a Fast, Liquid-Phase Reaction, *Chemical Engineering Science*, **54**, 2263-2271 (1999).

57. Gestoso, P., A.J. Müller and A.E. Sáez, Two-Dimensional Flow of Polymer Solutions through Porous Media, *Journal of Porous Media*, **2**, 251-262 (1999).

58. See, K.H., G.W. Roberts and A.E. Sáez, The Effect of Drag and Frictional Losses on the Hydrodynamics of Gas-Lift Reactors, *AIChE Journal*, **45**, 2467-2471 (1999).

59. Roberts, G.W., R.G. Carbonell and A.E. Sáez, Gas-Lift Reactors for Rapid Reactions with Appreciable Gas Consumption, *Chemical Engineering & Technology*, **23**, 80-87 (2000).

60. Littlejohn, F., C.S. Grant and A.E. Sáez, Mechanisms for the Removal of Calcium Phosphate Deposits in Turbulent Flow, *Industrial & Engineering Chemistry Research*, **39**, 933-942 (2000).

61. Rando, M., P.A. Socías, A.J. Müller, L.M. Smither and A.E. Sáez, Flow of Mixtures of Poly(Ethylene Oxide) and Hydrolyzed Polyacrylamide Solutions through Opposed Jets, *Journal of Applied Polymer Science*, **76**, 1910-1919 (2000).

62. Kabin, J.A., S.T. Withers, C.S. Grant, R.G. Carbonell and A.E. Sáez, Removal of Solid Organic Films from Rotating Disks Using Emulsion Cleaners, *Journal of Colloid and Interface Science*, **228**, 344-358 (2000).

63. Smitter, L., J.F. Guédez, A.J. Müller and A.E. Sáez, Interactions between Poly(Ethylene Oxide) and Sodium Dodecyl Sulfate in Elongational Flows, *Journal of Colloid and Interface Science*, **236**, 343-353 (2001).
64. Smitter, L., M.E. Torres, A.J. Müller and A.E. Sáez, Elongational Flow of Solutions Containing Poly(Ethylene Oxide)/Sodium Dodecyl Sulfate Complexes in the Presence of n-Alkanols, *Journal of Colloid and Interface Science*, **244**, 164-172 (2001).
65. Torres, M.E., A.J. Müller and A.E. Sáez, Effect of Ethanol Addition on the Elongational Flow Behavior of Aqueous Solutions of Poly(ethylene oxide), *Polymer Bulletin*, **47**, 475-483 (2002).
66. Smitter, L., J.C. Ruiz, M.E. Torres, A.J. Müller and A.E. Sáez, Elongational Flow of Solutions of Poly(ethylene oxide) and Sulfonated Surfactants, *Journal of Colloid and Interface Science*, **251**, 388-397 (2002).
67. Littlejohn, F., C.S. Grant, Y.L. Wong and A.E. Sáez, The Effect of Poly(aspartic acid) on the Removal Rates of Brushite Deposits from Stainless Steel Tubing in Turbulent Flow, *Industrial & Engineering Chemistry Research*, **41**, 4576-4584 (2002).
68. Patruyo, L.G., A.J. Müller and A.E. Sáez, Shear and Extensional Rheology of Solutions of Modified Hydroxyethylcelluloses and Sodium Dodecyl Sulfate, *Polymer*, **43**, 6481-6493 (2002).
69. Müller, A.J., Y. Garcés, M. Torres, B. Scharifker and A.E. Sáez, Interactions between High Molecular Weight Poly(ethylene oxide) and Sodium Dodecyl Sulfate, *Progress in Colloid and Polymer Science*, **122**, 73-81 (2003).
70. He, J., A.E. Sáez, W.P. Ela, E.A. Betterton and R.G. Arnold, Destruction of Aqueous Phase Carbon Tetrachloride in an Electrochemical Reactor with a Porous Cathode, *Industrial & Engineering Chemistry Research*, **43**, 913-923 (2004).
71. Müller, A.J., M.F. Torres and A.E. Sáez, Effect of the Flow Field on the Rheological Behavior of Aqueous Cetyltrimethylammonium *p*-toluene Sulfonate Solutions, *Langmuir*, **20**, 3838-3841 (2004).
72. He, J., R.G. Arnold, A.E. Sáez, E.A. Betterton and W.P. Ela, Removal of Aqueous Phase TCE using Membrane Air Stripping Contactors, *Journal of Environmental Engineering*, **130**, 1232-1241 (2004).
73. Pérez, R.M., S. Siquier, N. Ramírez, A.J. Müller and A.E. Sáez, Non-Newtonian Annular Vertical Flow of Sand Suspensions in Aqueous Solutions of Guar Gum, *Journal of Petroleum Science & Engineering*, **44**, 317-331 (2004).
74. Rengifo, F., A.E. Sáez, W.P. Ela, A. Quach, B. Garbo, C. Franks, B.J.J. Zelinski, D.P. Birnie, H.D. Smith and G.L. Smith, Microstructure and Leaching Behavior of Polymer Composites for Encapsulating Toxic Solid Wastes, *Industrial & Engineering Chemistry Research*, **43**, 7492-7499 (2004).
75. He, J., W.P. Ela, E.A. Betterton, R.G. Arnold and A.E. Sáez, Reductive Dehalogenation of Aqueous-phase Chlorinated Hydrocarbons in an Electrochemical Reactor, *Industrial & Engineering Chemistry Research*, **43**, 7965-7974 (2004).
76. González, J.M., A.J. Müller, M.F. Torres and A.E. Sáez, The Role of Shear and Elongation in the Flow of Semi-flexible Polymers through Porous Media, *Rheologica Acta*, **44**, 396-405 (2005).
77. Ju, X., M. Hecht, R.A. Galhotra, W.P. Ela, E.A. Betterton, R.G. Arnold and A.E. Sáez, Destruction of Gas-Phase Trichloroethylene in a Modified Fuel Cell, *Environmental Science and Technology*, **40**, 612-617 (2006).
78. Ghosh, A., A.E. Sáez and W.P. Ela, Effect of pH, Competitive Anions and NOM on the Leaching of Arsenic from Solid Residuals, *Science of the Total Environment*, **363**, 46-59 (2006).
79. Poloski, A.P., P.R. Bredt, R.C. Daniel and A.E. Sáez, The Contribution of Frictional Contacts to the Shear Strength of Coarse Glass Bead Powders and Slurries, *Rheologica Acta*, **46**, 249-259 (2006).
80. Ghosh, A., M. Mukiibi, A.E. Sáez and W.P. Ela, Leaching of Arsenic from Granular Ferric Hydroxide Residuals under Landfill Conditions, *Environmental Science and Technology*, **40**, 6070-6075 (2006).
81. Daniel, R.C., A.P. Poloski and A.E. Sáez, A Continuum Constitutive Model for Cohesionless Granular Flows, *Chemical Engineering Science*, **62**, 1343-1350 (2007).

82. Penott, E.K., L. Gouveia, I.J. Fernández, A.J. Müller, A. Díaz-Barrios and A.E. Sáez, Rheology of Aqueous Solutions of Hydrophobically Modified Polyacrylamides and Surfactants, *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **295**, 99-106 (2007).
83. Torres, M.F., J.M. González, M.R. Rojas, A.J. Müller, A.E. Sáez, D. Löf, and K. Schillén, Effect of Ionic Strength on the Rheological Behavior of Aqueous Cetyltrimethylammonium p-Toluene Sulfonate Solutions, *Journal of Colloid and Interface Science*, **307**, 221-228 (2007).
84. Conroy, O., A.E. Sáez, D. Quanrud, W.P. Ela and R.G. Arnold, Changes in Estrogen/Anti-Estrogen Activities in Poned Secondary Effluent, *Science of the Total Environment*, **382**, 311-323 (2007).
85. Orbay, O., G. Song, B. Barbaris, E. Rupp, A.E. Sáez, R.G. Arnold and E.A. Betterton, Catalytic Dechlorination of Gas-phase Perchloroethylene under Mixed Redox Conditions, *Applied Catalysis B: Environmental*, **79**, 43-52 (2008).
86. Daniel, R.C., A.P. Poloski and A.E. Sáez, Vane Rheology of Cohesionless Glass Beads, *Powder Technology*, **181**, 237-248 (2008).
87. Shaw, J.K., S. Fathordoobadi, B.J. Zelinski, W.P. Ela and A.E. Sáez, Stabilization of Arsenic-bearing Solid Residuals in Polymeric Matrices, *Journal of Hazardous Materials*, **152**, 1115-1121 (2008).
88. Rojas, M.R., A.J. Müller and A.E. Sáez, Synergistic Effects in Flows of Mixtures of Wormlike Micelles and Hydroxyethyl Celluloses with or without Hydrophobic Modifications, *Journal of Colloid and Interface Science*, **322**, 65-72 (2008).
89. Zhang, J., M. Tomanek, H. Dong, R.G. Arnold, W.P. Ela, D.M. Quanrud and A.E. Sáez, Fate of Polybrominated Diphenyl Ethers, Nonylphenol and Estrogenic Activity during the Managed Infiltration of Wastewater Effluent, *Journal of Environmental Engineering*, **134**, 433-442 (2008).
90. Rojas, M.R., A.J. Müller and A.E. Sáez, Shear Rheology and Porous Media Flow of Wormlike Micelle Solutions Formed by Mixtures of Surfactants of Opposite Charge, *Journal of Colloid and Interface Science*, **326**, 221-226 (2008).
91. Torres, M.F., A.J. Müller, M.A. Szidarovszky and A.E. Sáez, Shear and Extensional Rheology of Solutions of Mixtures of Poly(ethylene oxide) and Anionic Surfactants in Ionic Environments, *Journal of Colloid and Interface Science*, **326**, 254-260 (2008).
92. Mukiibi, M., W.P. Ela and A.E. Sáez, Ferrous Iron Effect on Arsenate Sorption to Amorphous Ferric Hydroxide, *Annals of the New York Academy of Sciences*, **1140**, 335-345 (2008).
93. Arnold, R.G., S. Teske, M. Tomanek, J. Engstrom, C. Leung, J. Zhang, Q. Banihani, D. Quanrud, W.P. Ela and A.E. Sáez, Fate of Polybrominated Diphenyl Ethers during Wastewater Treatment/Polishing and Sludge Stabilization/Disposal, *Annals of the New York Academy of Sciences*, **1140**, 394-411 (2008).
94. Gao, S., E. Rupp, S. Bell, M. Willinger, T. Foley, B. Barbaris, A.E. Sáez, R.G. Arnold and E.A. Betterton, Mixed Redox Catalytic Destruction of Chlorinated Solvents in Soils and Groundwater: From the Laboratory to the Field, *Annals of the New York Academy of Sciences*, **1140**, 435-445 (2008).
95. Amundarain, J.L., L.J. Castro, M.R. Rojas, S. Siquier, N. Ramírez, A.J. Müller and A.E. Sáez, Solutions of Xanthan Gum/Guar Gum Mixtures: Shear Rheology, Porous Media Flow and Solids Transport in Annular Flow, *Rheologica Acta*, **48**, 491-498 (2009).
96. Willinger, M., E. Rupp, B. Barbaris, S. Gao, R.G. Arnold, E.A. Betterton and A.E. Sáez, Thermocatalytic Destruction of Gas-Phase Perchloroethylene Using Propane as a Hydrogen Source, *Journal of Hazardous Materials*, **167**, 770-776 (2009).
97. Calderón, M., M.I. Velasco, M.C. Strumia, A.T. Lorenzo, A.J. Müller, M.R. Rojas and A.E. Sáez, Synthesis of Amphiphilic Dendrons and their Interactions in Aqueous Solutions with Cetyltrimethylammonium p-Toluenesulfonate (CTAT), *Journal of Colloid and Interface Science*, **336**, 462-469 (2009).
98. Rupp, E.C., E.A. Betterton, R.G. Arnold and A.E. Sáez, Interaction of Perchloroethylene with Cerium Oxide in Three-Way Catalysts, *Catalysis Letters*, **132**, 153-158 (2009).
99. Rojas, M.R., A.J. Müller and A.E. Sáez, Effect of Ionic Environment on the Rheology of Wormlike Micelle Solutions of Mixtures of Surfactants with Opposite Charge, *Journal of Colloid and Interface Science*, **342**, 103-109 (2010).

100. Shan, J., A.E. Sáez and W.P. Ela, Evaluating the Mobility of Arsenic in Synthetic Iron-Containing Solids Using a Modified Sequential Extraction Method, *Journal of Environmental Engineering*, **136**, 238-245 (2010).
101. Rojas, M.R., F. Pérez, D. Whitley, R.G. Arnold and A.E. Sáez, Modeling of Advanced Oxidation of Trace Organic Contaminants by Hydrogen Peroxide Photolysis and Fenton's Reaction, *Industrial & Engineering Chemistry Research*, **49**, 11331–11343 (2010).
102. Rodríguez, M., J. Xue, L.M. Gouveia, A.J. Müller, A.E. Sáez, J. Rigolin and B. Grassl, Shear Rheology of Anionic and Zwitterionic Modified Polyacrylamides, *Colloids and Surfaces A*, **373**, 66-73 (2011).
103. Ela, W.P., D.L. Sedlak, M. Barlaz, H. Henry, D. Muir, D. Swackhamer, E.J. Weber, R.G. Arnold, L. Ferguson, J. Field, E. Furlong, J. Giesy, R. U. Halden, T. Henry, R. Hites, K. Hornbuckle, P. Howard, R. Luthy, A. Meyer, A.E. Sáez, F. vom Saal, C. Vulpe and M. Wiesner, Towards Identifying the Next Generation of Superfund and Hazardous Waste Site Contaminants, *Environmental Health Perspectives*, **119**, 6-10 (2011).
104. Arnold, R.G., J. Hayworth, A.E. Sáez, C. Rodriguez, P. Weinstein, B. Ling, S. Memon, The Status of Water and Sanitation among Pacific Rim Nations, *Reviews on Environmental Health*, **26**, 17-30 (2011).
105. Csavina, J., A. Landázuri, A. Wonaschütz, K. Rine, P. Rheinheimer, B. Barbaris, W. Conant, A.E. Sáez and E.A. Betterton, Metal and Metalloid Contaminants in Atmospheric Aerosols from Mining Operations, *Water, Air, and Soil Pollution*, **221**, 145-157 (2011).
106. Rojas, M.R., C. Leung, D. Whitley, Y. Zhu, R.G. Arnold and A.E. Sáez, Advanced Oxidation of Trace Organics in Water by Hydrogen Peroxide Solar Photolysis, *Industrial & Engineering Chemistry Research*, **50**, 12479-12487 (2011).
107. Rivero, D., L.M. Gouveia, A.J. Müller and A.E. Sáez, Shear Thickening Behavior of High Molecular Weight Poly(Ethylene Oxide) Solutions, *Rheologica Acta*, **51**, 13-20 (2012).
108. Rojas, M.R and A.E. Sáez, Two-Layer Model for Horizontal Pipe Flow of Newtonian and Non-Newtonian Settling Dense Slurries, *Industrial & Engineering Chemistry Research*, **51**, 7095-7103 (2012).
109. Csavina, J., J. Field, M.P. Taylor, S. Gao, A. Landázuri, E.A. Betterton and A.E. Sáez, A Review on the Importance of Metals and Metalloids in Atmospheric Dust and Aerosol from Mining Operations, *Science of the Total Environment*, **433**, 58-73 (2012).
110. Beamer, P.I., C.E. Luik, L. Abrell, S. Campos, M.E. Martinez and A.E. Sáez, Concentration of Trichloroethylene in Breast Milk and Household Water from Nogales, Arizona, *Environmental Science & Technology*, **46**, 9055-9061 (2012).
111. Sorooshian, A., J. Csavina, T. Shingler, S. Dey, F.J. Brechtel, A.E. Sáez, E.A. Betterton, Hygroscopic and Chemical Properties of Aerosols collected near a Copper Smelter: Implications for Public and Environmental Health, *Environmental Science & Technology*, **46**, 9473-9480 (2012).
112. Arnold, R.G., A.E. Sáez, S.A. Snyder, S.K. Maeng, C. Lee, G.J. Woods, X. Li, H. Choi, Direct Potable Reuse of Reclaimed Wastewater— It Is Time for Rational Discussion, *Reviews on Environmental Health*, **27**, 197-206 (2012).