

Chemical and Nuclear Engineering

Atanassov, Plamen

S. Calabrese Barton, "Bio-Fuel Cells for Implantable and Micro-Scale Devices" (Review), *Chemical Reviews*, 104 (2004), 4867-4886.

J. Xie, D.L. Wood, D.M. Wayne, T. Zawodzinski, and R.L. Borup, "Durability of Polymer Electrolyte Fuel Cells at High Humidity Conditions," *J. Electrochem. Soc.*, 152 (2004) A104-A113.

T.S. Olson and D.A. Brevnov, "Electrodeposition of Gold on Aluminum/Copper Substrates," *J. Phys. Chem. B.*, 109 (2004) 1243-1250.

D.A. Brevnov, T.S. Olson and G.P. López, "Electroless Deposition of Silver by Galvanic Displacement on Aluminum Aligned with Copper," *J. Phys. Chem. B.*, 108 (2004) 17531-17536.

N. Liu, D.R. Dunphy, S.D. Bunge, Z. Chen, G.P. López, T.J. Boyle and C.J. Brinker, "Photoregulation of Mass Transport Through a Photoresponsive Azobenzene-Modified Nanoporous Membrane," *Nano Letters*, 4 (2004) 551-554.

D.A. Brevnov, M. Barela, M.J. Brooks and G.P. López, Fabrication of Anisotropic "Super-Hydrophobic / Hydrophilic Nanoporous Membranes by Plasma Polymerization of C₄F₈ on Anodic Aluminum Oxide," *J. Electrochem. Soc.*, 151 (2004) B484-B489.

D.A. Brevnov, G.V. Rama Rao and G.P. López, "Dynamics and Temperature Dependence of Etching Processes of porous and barrier aluminum oxide layers," *Electrochimica Acta*, 49 (2004) 2487-2494.

D.A. Brevnov, M. Barela, M.E. Piyasena and G.P. López, "Patterning of nanoporous anodic aluminum oxide arrays by using sol-gel processing, photolithography and plasma etching," *Chemistry of Materials*, 16 (2004) 682-687.

G. Gupta and V. Rajendran, "Bioelectrocatalysis of Oxygen Reduction Reaction by Laccase on Gold Electrodes," *Electroanalysis*, 16 (2004) 1182-1185.

J. Yan, G.V. Rama Rao and G.P. López, "Anodization Patterned on Aluminum Surfaces." In J.A. Schwarz, C.I. Contescu, and K.L. Putyera (Eds.), *Encyclopedia of Nanoscience and Nanotechnology*, Marcel Dekker, Inc., New York, NY, 2004; pp. 83-89.

G.P. López, A. Chilkoti, and V. Goparaju “Stimuli Responsive Hybrid Materials Containing Molecular Actuators and their Applications.” *US Patent No: 6,755,621*, June 29, 2004.

Brinker, C. Jeffrey

“Controlled synthesis of 2-D and 3-D dendritic platinum nanostructures,” Song YJ, Yang Y, Medforth CJ, Pereira E, Singh AK, Xu HF, Jiang YB, van Swol F, Shelnett JA, *Journal of the American Chemical Society*, Jan. 21 2004, v. 126, no. 2, pp. 635-645.

“Self-assembly of ordered, robust, three-dimensional gold nanocrystal/silica arrays,” Fan HY, Yang K, Boye DM, Sigmon T, Malloy KJ, Xu HF, Lopez GP, *Science*, Apr. 23 2004, v. 304, no. 5670, pp. 567-571.

“Photoregulation of Mass Transport through a Photoresponsive Azobenzene-Modified Nanoporous Membrane,” Liu N, Dunphy DR, Atanassov P, Bunge SD, Chen Z, López GP, Boyle TJ, *Nanoletters*, Apr. 2004, v. 4, no. 4, pp. 551-554.

“Unusual hydrocarbon chain packing mode and modification of crystallite growth habit in the self-assembled nanocomposites zinc-aluminum-hydroxide oleate and elaidate (cis- and trans-[Zn₂Al(OH)(6)(CH₃(CH₂)₇CH=CH(CH₂)₇COO-)] and magnesium analogues,” Xu ZP, Braterman PS, Yu K, Xu HF, Wang YF, *Chemistry of Materials*, Jul. 13 2004, v. 16, no. 14, pp. 2750-2756.

“Evaporation-induced self-assembly: Functional nanostructures made easy,” *Mrs Bulletin*, Sep. 2004, v. 29, no. 9, pp. 631-640.

“Characterization of self-assembled lamellar thermoresponsive silica-hydrogel nanocomposite films,” Garnweitner G, Smarsly B, Assink R, Dunphy DR, Scullin C, *Langmuir*, Oct. 26 2004, v. 20, no. 22, pp. 9811-9820.

“A general route to macroscopic hierarchical 3D nanowire networks,” Wang DH, Luo HM, Kou R, Gil MP, Xiao SG, Golub VO, Yang ZZ, Lu YF, *ANGEWANDTE - Chemie International Edition*; Nov. 19 2004, v. 43, no. 45, pp. 6169-6173.

Curro, John G.

D. Heine and G.S. Grest, “Structure of Polymer Melts and Blends: Comparison of Integral Equation Theory and Computer Simulation,” *Adv. Polym. Sci.*, 176, 211 (2004).

E. Jaramillo, G.S. Grest, D.T. Wu, “Anomalous Mixing of Polyisobutylene/Polypropylene Blends: Molecular Dynamics Simulation,” *Study, J. Chem. Phys.* 120, 8883 (2004).

S. Mendez “Integral Equation Theory of Polymer Solutions: Application to Polyethylene/Benzene Solutions,” *Macromolecules*, 37, 1980 (2004).

D. Rottach, G.S. Grest, A.P. Thompson, “Effect of Strain History on Stress and Permanent Set in Crosslinking Networks: A Molecular Dynamics Study,” *Macromolecules*, 37, 5468 (2004).

A.L. Frischknecht, “Comparison of Random-Walk Density Functional Theory to Simulation for Bead-Spring Homopolymer Melts,” *J. Chem. Phys.* 121, 2788 (2004).

J. Budzien, J.D. McCoy, D. Rottach, “Effects of Chain Stiffness and Penetrant Size on Penetrant Diffusion in Simple Polymers: Deduced Relations from Simulation and PRISM,” *Theory Polymer*, 45, 3923 (2004).

Datye, Abhaya. K.

Bravo J., A. Karim, T. Conant, G.P. Lopez, (2004). “Wall coating of a CuO/ZnO/Al₂O₃ methanol steam reforming catalyst for micro-channel reformers,” *Chemical Engineering Journal*, 101 (2004) 113–121.

Bukur, D. B., V. Carreto-Vazquez and H. N. Pham, (2004). “Attrition properties of precipitated iron Fischer-Tropsch catalysts.” *Applied Catalysis, A: General*, 266(1): 41-48.

Zea, H., C.-K. Chen, K. Lester, A. Phillips, I. Fonseca and J. Phillips, (2004). “Plasma torch generation of carbon supported metal catalysts.” *Catalysis Today* 89(1-2): 237-244.

Zhu, G., K.-I. Fujimoto, D. Y. Zemlyanov, and F. H. Ribeiro, (2004). “Coverage of palladium by silicon oxide during reduction in H₂ and complete oxidation of methane.” *Journal of Catalysis* 225(1): 170-178.

Vanamu, G., K. Lester, J.C. Weigle and J. Phillips, (2004). “Study of Modification of Irregular Titania Powder Passed as an Aerosol through a Low Power Microwave Plasma Torch,” *AIChE Journal*, 50(9): 2090-2100.

Vanamu, G. and S.H. Zaidi, (2004). “Heteroepitaxial growth and characterization of Ge and Si_xGe_{1-x} films on patterned silicon structures.” *Mat. Res. Soc. Symp. Proc.*, Vol. 809, Materials Research Society.

Vanamu G., T.A. Khraishi, and S.H. Zaidi, (2004). “Modeling the Elastic Fields in Epitaxially Grown Multilayers,” *Mat. Res. Soc. Symp. Proc.* Vol. 821, Materials Research Society.

Bore, M.T., H.N. Pham, and T.L. Ward, (2004). "Role of pore curvature on the thermal stability of gold nanoparticles in mesoporous silica," *Chem. Commun.*, 2620-2621.

Bore, M.T., T.L. Ward, and A. Fukuoka, (2004). "Synthesis of Pt nanowires inside aerosol derived spherical mesoporous silica particles." *Catalysis Letters*, 98: p. 167-172.

El-Genk, Mohamed S.

Momozaki, Y., "Investigations of the Performance of Grooved Electrodes Thermionic Converters at Collector Temperatures up to 1023 K," *J. Energy Conversion and Management*, 45, 2004, 1153-1174.

Saber, H.H., "On the Breakup of a Thin Flowing Liquid Film subject Interfacial Shear," *J. Fluid Mechanics*, 500, 2004, 113.

Parker, J., "Pool Boiling in Saturated and Subcooled HFE-7100 Dielectric Fluid from a Porous Graphite Surface," *Proceedings 9th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (Itherm 2004)*, 1, 2004, 655-662.

Tournier, J.-M., "AMTEC/TE Static Converter for High Energy Utilization, Small Nuclear Power Plants," *J. Energy Conversion and Management*, 45, 2004, 511-535.

Tournier, J.-M., "An Analysis of Coated Particles Fuel Compact-General Purpose Heat Source (CPFC-GPHS)," *J. Progress in Nuclear Energy*, 44(3), 2004, 215-236.

Tournier, J.-M., "SAIRS"-Scalable AMTEC Integrated Reactor Space Power System, *J. Progress in Nuclear Energy*, 45(1), 2004, 25-69.

Parker, J., "Pool Boiling in Saturated and Subcooled FC-72 Dielectric Fluid from a Porous Graphite Surface," *Proceedings of the ASME International Mechanical Engineering Congress*, No. IMECE2004-59905, Anaheim, CA, 13-19 November 2004.

Saber, H. H., and T. Caillat, "Performance Tests of Skutterudites and Segmented Thermoelectric Converters," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 541-552.

Tournier, J.-M., "Mechanically Alloyed-Oxide Dispersion Strengthened Steels for Use in Space Nuclear Power Systems," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 829-844.

Saber, H. H., "Cascaded Thermoelectric Conversion-Advanced Radioisotope Power Systems (CTC-ARPSs)," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 230-241

Saber, H. H., "Cascaded Thermoelectric Converters for Advanced Radioisotope Power Systems," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 529-540.

Tournier, J.-M., "Performance Analysis of Potassium Heat Pipes Radiator for HP-STMCs Space Reactor Power System," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 793-805.

Tournier, J.-M., "Conceptual Design of HP-STMCs Space Reactor Power System for 110 kW_e," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 658-672.

King, J. C., "A Methodology for the Neutronics Design of Space Nuclear Reactors," *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 319-329.

Tournier, J.-M., "Reactor Lithium Heat Pipes for HP-STMCs Space Reactor Power System" *Proceedings of the Space Technology and Applications International Forum (STAIF-04)*, No. 669, American Institute of Physics, Melville, NY, 2004, 781-792.

Saber, H. H., J. Sakamoto, and T. Caillat, "Performance Tests of Coated and Uncoated Segmented Skutterudites/BiTe Thermoelectric Unicouples," *Proceedings of the 23rd International Conference of Thermoelectrics (ICT-2004)*, Adelaide, Australia, 25-29 July 2004.

Fulghum, Julia E.

"Study of ion beam alignment of liquid crystals on polymer substrates." Su L., Artyushkova K., West J.L., Reznikov Y., *Molecular Crystals and Liquid Crystals*, 2004, 412, 1971-1978.

"Reversible control of free energy and topography of nanostructured surfaces" Fu Q., Rao G.V.R., Basame S.B., Keller D.J., Artyushkova K., Lopez G., *Journal of the American Chemical Society*, July 2004, v. 126, no. 29, pp. 8904-8905

"Multivariate Analysis Applied to Topographical Corrections in X-ray Photoelectron Images," Artyushkova K., *Surf. Inter. Anal.*, 2004, 36, 1304-1313.

Han, Sang M.

Qiming Li, Ying-Bing Jiang, Huifang Xu and Steve Hersee, "Heteroepitaxy of high quality Ge on Si by nanoscale Ge seeds grown through a thin layer of SiO₂," *Appl. Phys. Lett.*, 85(11), 1928 (2004), and *Virtual Journal of Nanoscale Science & Technology*, Oct. 4 (2004).

Madhava R. Kosuri, Roya Cones, Qiming Li, Bruce C. Bunker, and Thomas M. Mayer, "Adsorption Kinetics of Alkanethiol Self-Assembly on Ge(111)," *Langmuir*, 20(3), 835 (2004).

López, Gabriel P.

"Generation of Aluminum Nanoparticles Using an Atmospheric Plasma Torch," Weigle J.C., Luhrs C.C., Chen C.K., Perry W.L., Mang J.T., Nemer M.B., Phillips J., *J. Phys. Chem. B* 2004, 108, 18601-07.

"Fabrication of Anisotropic Super Hydrophobic/Hydrophilic Nanoporous Membranes by Plasma Polymerization of C₄F₈ on Anodic Aluminum Oxide," Brevnov D., Barela M., Brooks M.J., Atanassov P.B., *J. Electrochem. Soc.* 2004, 151, B484-89.

"Study of Conformational Change of PNIPAM Grafted Chains in Water Using Neutron Reflection and Numerical SCF Calculations: Molecular Weight Dependence at High Grafting Density," Yim H., Kent M.S., Curro J.G., Satija S., McCoy J.D., Mendez S., Balamurugan S.S., Balamurugan S., *J. Polym. Sci., Polym. Phys.* 2004, 42, 3302-10.

"Patterning of Nanoporous Anodic Aluminum Oxide Arrays by Using Sol-Gel Processing, Optical Photolithography and Plasma Etching," Brevnov D.A., Barela M., Piyasena M.E., Atanassov P.B., *Chem. Mater.* 2004, 16, 682-687.

"Electroless Deposition of Silver by Galvanic Displacement on Aluminum Alloyed with Copper," Brevnov D.A., Olson T.S., Atanassov P., *J. Phys. Chem. B.* 2004, 108, 17531-36.

"Near Simultaneous and Real Time Detection of Multiple Analytes in Affinity Microcolumns," Piyasena M.E., Buranda T., Wu Y., Huang J., Sklar L.A., *Anal. Chem.* 2004, 76, 6266-73.

"Reversible Control of Free Energy and Topography of Nanostructured Surfaces," Fu Q., Rama Rao G.V., Basame S.B., Keller D.J., Artyushkova K., Fulghum J.E., *J. Amer. Chem. Soc.* 2004, 126, 8904-8905.

“Wall Coating of a CuO/ZnO/Al₂O₃ Methanol Steam Reforming Catalyst for Micro-Channel Reformers,” Bravo J., Karim A., Conant T., Datye A., *Chem. Eng. J.* 2004, 101, 113-121.

“Photoregulation of Mass Transport Through a Photoresponsive Azobenzene-Modified Nanoporous Film,” Liu N., Dunphy D., Atanassov P., Bunge S.D., Chen Z., Boyle T., Brinker C.J., *Nanolett.* 2004, 4, 441-554.

“Self-Assembly and Integration of Ordered, Robust Gold Nanocrystal/Silica Arrays,” Fan H., Yang K., Boye D.M., Sigmon T., Malloy K.J., Xu H., Brinker C.J., *Science* 2004, 304, 567-571.

“Effect of Substratum Surface Chemistry and Surface Energy on Attachment of Marine Bacteria and Algal Spores,” Ista L.K., Callow M.E., Finlay J.A., Coleman S.E., Nolasco A.C., Simons R.H., Callow J.A., *Appl. Environ. Microbiol.* 2004, 70, 4151-57.

Morel, Jim E.

J. S. Warsa, T. A. Wareing, J. M. McGhee, and R. B. Lehoucq, “Krylov Subspace Iterations for Deterministic k-Eigenvalue Calculations,” *Nuclear Science and Engineering*, 147, 26-42 (2004).

K. D. Lathrop, “Singular Solutions, Integral Transport Theory, and the S_S_n Method,” *Nuclear Science and Engineering*, 147, 158-166 (2004).

J. S. Warsa and T. A. Wareing, “Krylov Iterative Methods and the Degraded Effectiveness of Diffusion Synthetic Acceleration for Multidimensional S_S_n Calculations in Problems with Material Discontinuities,” *Nuclear Science and Engineering*, 147, 218-248 (2004).

Konstantin Lipnikov, and Mikhail Shashkov, “Mimetic Finite Difference Methods for Diffusion Equations on Non-Orthogonal Non-Conformal Meshes,” *Journal of Computational Physics*, 199, 589-597 (2004).

Nuttall, H. Eric

In Situ Permeable Biofilms for Drinking Water Production. L. Dutta, G. Chopra, A. Cunningham, G. James, and R. Hiebert, *Remediation of Chlorinated and Recalcitrant Compounds*, 2004.

Investigation of Biomass and Their Mitigation for In Situ Bioremediation. G. Chopra, L. Dutta, P. Hatzinger, and M.N. Goltz, *Remediation of Chlorinated and Recalcitrant Compounds*, 2004.

In Situ Remedial Success at a Multiple-Remedy Mixed-Constituent Site. D. Gray, F. Coll, R. Fasano, B. Lundy and B. Baker, *Remediation of Chlorinated and Recalcitrant Compounds*, 2004.

Phillips, Jonathan

William Kroenke and William Lee Perry. (2004). "Method for Producing Metallic Nanoparticles," *U.S. Patent 6,689,192*.

William Kroenke and William Lee Perry. (2004). "Method for Producing Metallic Microparticles," *U.S. Patent 6,755,886*.

Xeumin Chen and Randall Mills. (2004). "Water Bath Calorimetry Study of Excess Heat Production in Resonant Transfer Plasmas," *Journal of Applied Physics*, 96, 3095.

Ganesh Vanamu, Kelvin Lester, Abhaya Datye, John Weigle and Chun-Ku Chen. (2004). "Study of the Modification of Irregular Titania Powder Passed as an Aerosol Through a Low Power Microwave Plasma Torch", *AIChE J.* 50, 2090.

Hugo Zea, Chun-Ku Chen, Kelvin Lester, Ariel Phillips, Abhaya Datye and Isabel Fonseca. (2004). "Plasma Torch Production of Carbon Supported Metal Catalysts," *Catalysis Today* 89, 237.

John C. Weigle. (2004). "Novel Dual Bed Reactors: Utilization of Hydrogen Spillover in Reactor Design," *Langmuir*, 20, 1189.

John C. Weigle. (2004). "Modeling Hydrogen Spillover in Dual-Bed Catalytic Reactors," *AIChE J.* 50, 821.

L. V. Berlyand, D. Golovaty and A. B. Movchan. (2004). "Transport properties of densely packed composites. Effect of shapes and spacings of inclusions," *Quarterly Journal of Mechanics and Applied Mathematics* 57, 495-528.

John C. Weigle, Claudia C. Luhrs, C. K. Chen, W. Lee Perry, Joseph T. Mang, Gabriel P. Lopez. (2004). "Generation of Aluminum Nanoparticles Using an Atmospheric Pressure Plasma Torch," *J. Phys. Chem. B* 108, 1860.

Prinja, Anil K.

Franke, B.C., "A Regularized Boltzmann Collision Operator for Highly Forward Peaked Scattering," *Transactions of the American Nuclear Society*, Vol. 90, 281 (2004).

"On the Master Equation Approach to Transport in Discrete Random Media in the Presence of Scattering," *Annals of Nuclear Energy*, Vol. 31, 2005 (2004).

Roderick, Norman F.

T.W.L. Sanford, T.J. Nash, R.E. Olson, D.E. Bliss, R.W. Lemke, C.L. Olson, C.L. Ruiz, R. C. Mock, J.E. Bailey, G.A. Chandler, M.E. Cuneo, R.J. Leeper, M.K. Matzen, T.A. Mehlhorn, S.A. Slutz, W.A. Stygar, D. L. Peterson, R.E. Crien, R.C. Watt, G.W. Cooper, J.P. Apruzese, G.S. Sarkisov, J.P. Chittenden, M.G. Haines, "Progress in Z-Pinch Driven Dynamic-Hohlraums for High-Temperature Radiation-Flow and ICF Experiments at Sandia National Laboratories," *Plasma Phys. Control. Fusion*, 42, B423-B433, Dec. 2004.

Ueki, Taro

F.B. Brown, D.K. Parsons, and J.S. Warsa, "Time Series Analysis of Monte Carlo Fission Sources: I. Dominance Ratio Computation," *Nuclear Sciences and Engineering* 148, 374 (2004).

"Entropy and Undersampling in Monte Carlo Criticality Calculations," *Transactions of American Nuclear Society* 91, 119 (2004).

"Time Series Modeling and MacMillan's Formula for Monte Carlo Iterated-Source Methods," *Transactions of American Nuclear Society* 90, 449 (2004).

"Principal Component Analysis for Monte Carlo Criticality/Eigenvalue Calculations," *Transactions of American Nuclear Society* 90, 461 (2004).

Ward, Timothy L.

M.T. Bore, H.N. Pham, and A. K. Datye, "Role of pore curvature on the thermal stability of gold nanoparticles in mesoporous silica," *Chem. Commun.*, 2004, 2620-2621.

M.T. Bore, A. Fukuoka, and A.K. Datye, "Synthesis of Pt nanowires inside aerosol derived spherical mesoporous silica particles," *Catalysis Letters* 98 (4), 167-172 (2004).