

Selected Publications through 2007

Robert K. Prud'homme

2007
Single Sheet Functionalized Graphene by Oxidation and Thermal Expansion of Graphite." <i>Chem. Mat.</i> , 19 , 4396-4404 (2007) [with M. J. McAllister, J. -L. Li, D. H. Adamson, H. C. Schniepp, A.A. Abdala, J. Liu, M. Herrera-Alonso, D. L. Milius, R. Car, and I. A. Aksay].
"Intercalation and Stitching of Graphite Oxide with Diaminoalkanes." <i>Langmuir</i> , 23 , 10644-10649 (2007) [with M. Herrera-Alonso, A. A. Abdala, M. J. McAllister, and I. A. Aksay].
"Protein Diffusion through Polymer Meshes as Observed by Pulsed-Field Gradient NMR." <i>IEEE</i> , , 706-708 (2007) [with X. Guo, L. Li, C. R. Pacheco, and L. Fu].
"Formation and Characterization of Polymersomes Made by a Solvent Injection Method." <i>Polym. Adv. Technol.</i> , 18 , 427-432 (2007) [with M. E. Yildiz, I. Robb, and D. H. Adamson].
"Ostwald Ripening of Beta-Carotene Nanoparticles." <i>Phys. Rev. Lett.</i> , 98 , 036102 (2007) [with Y. Liu, K. Kathan, and W. Saad].
"Novel Laboratory Cell for Fundamental Studies of the Effect of Polymer Additives on Wax Deposition from Model Crude Oils." <i>Energy & Fuels</i> , 21 , 1301-1308 (2007) [with J. F. Tinsley, X. Guo, D. H. Adamson, S. Callahan, D. Amin, S. Shao, R. M. Kriegel, and R. Saini].
2006
"Kinetics of Enzymatic Depolymerization of Guar Galactomannan." <i>Biomacromolecules</i> , 7 , 2583-2590 (2006) [with S. Mahammad, G. W. Roberts, and S. A. Khan].
"Preparation of Aggregation Stable Block Copolymer Nanoparticles for Simultaneous Drug Delivery and Imaging." Technical Proceedings of the 2006 NSTI Nanotechnology Conference and Trade Show, Volume 2, Chapter 6: Medical Imaging through Nanotechnology, pp. 448-450 (2006) [with M. E. Gindy].
"Rheology Control by Modulating Hydrophobic and Inclusion Associations in Modified Poly(acrylic acid) Solution." <i>Polymer</i> , 47 , 2976-2983 (2006) [with X. Guo, A. A. Abdala, B. L. May, S. F. Lincoln, and S. A. Khan].
"Functionalized Single Graphene Sheets Derived from Splitting Graphite Oxide." <i>J. Phys. Chem. B</i> , 110 , 8535-8539 (2006) [with H. C. Schniepp, J. -L. Li, M. J. McAllister, H. Sai, M. Herrera-Alonso, D. H. Adamson, R. Car, D. A. Saville, and I. A. Aksay].
"Oxygen-Driven Unzipping of Graphitic Materials." <i>Phys. Rev. Lett.</i> , 96 , 176101 1-4 (2006) [with J.-L. Li, K. N. Kudin, M. J McAllister, I. A. Aksay, and R. Car].

<p>"Accurate Prediction of Clathrate Hydrate Phase Equilibria Below 300 K from a Simple Model." <i>J. Petro. Sci. Engr.</i>, 51, 45-53 (2006) [with Y. Zhang, P. G. Debenedetti, and B. A. Pethica].</p>
<p>"NanoPrecipitation of Pharmaceuticals Using Mixing and Block Copolymer Stabilization." <i>Polymeric Drug Delivery II – Polymeric Matrices and Drug Particle Engineering</i>, S. Svenson (Ed.), <i>ACS Symposium Series</i>, 924, 278-291, American Chemical Society, Washington, DC 2006 [with B. K. Johnson and W. Saad].</p>
<p>"Effect of Cooling Rate on Crystallization of Model Waxy Oils with Microcrystalline Poly(ethylene butene)." <i>Energy & Fuels</i>, 20, 250-256 (2006) [with X. Guo, B. A. Pethica, J. S. Huang, and D. H. Adamson].</p>
<p>"pH Triggered Release of Protective Poly(Ethylene Glycol)-b-Polycation Copolymers from Liposomes." <i>Biomaterials</i>, 27, 2599-2608 (2006) [with D. T. Auguste, S. P. Armes, K. R. Brzezinska, T. J. Deming, and J. Kohn].</p>
<p>"Polymer-Protected Liposomes: Association of Hydrophobically-Modified PEG with Liposomes." <i>Polymeric Drug Delivery I – Particulate Drug Carriers</i>, Svenson, S. (Ed.), <i>ACS Symposium Series</i>, 923, pp. 95-120 American Chemical Society, Washington, DC (2006) [with D. Auguste, P. Ahl, P. Meers, and J. Kohn].</p>
<p>2005</p>
<p>"Effect of Hydrophobically Modified Polymers on Shear-Induced Multilamellar Vesicles." <i>Langmuir</i>, 21, 10038-10045 (2005) [with B. S. Yang and W. B. Russel].</p>
<p>"Interaction of Paraffin Wax Gels with Ethylene/Vinyl Acetate Co-Polymers." <i>Energy & Fuels</i>, 19, 138-144 (2005) [with H. S. Ashbaugh, X. H. Guo, D. Schwahn, D. Richter and L. J. Fetters].</p>
<p>"Novel Associative Polymer Networks Based on Cyclodextrin Inclusion Compounds." <i>Macromolecules</i>, 38, 3037-3040 (2005) [with X. H. Guo, A. A. Abdala, B. L. May, S. F. Lincoln, and S. A. Khan].</p>
<p>"Compositions for Fracturing Subterranean Formations." U.S. Patent #6,936,454, August 30, 2005.</p>
<p>"Polymersome Compositions and Associated Methods of Use." U. S. Patent #7,151,077, December 19, 2005 [with L. R. Norman, D. H. Adamson, M. E. Yildiz, and I. D. Robb].</p>
<p>2004</p>
<p>"Syneresis of Carrageenan Gels: NMR and Rheology," <i>J. Soft Materials</i>, 2, 145-153 (2004) [with S. Ramakrishnan].</p>
<p>"Synthesis of Poly(ethylene-butene) Random Copolymers with Hydroxylic Grafts and Effect of Polar Groups on Deposition of Wax and Asphaltenes from Crude Oil." <i>Preprints-Amer. Chem. Soc., Div. Petro. Chem.</i>, 49, 272-273 (2004) [with X. Guo, D. A. Adamson, J. Tinsley, B. A. Pethica, and J. S. Huang].</p>

<p>"Influence of Micro-Crystalline Poly(ethylene-butene) Random Copolymers on Wax Gelation of Black Oils." <i>Preprints-Amer. Chem. Soc., Div. of Petro. Chem.</i>, 49, 388-389 (2004) [with X. Guo, B. A. Pethica, D. A. Adamson, J. Tinsley, and J. S. Huang].</p>
<p>"Preparation of Biocompatible Hydrogel Adhesives Controlled by Rheological Method." <i>Polymer Preprints</i>, 45, 604-605 (2004) [with X. Guo, F. Deng, S. J. Leth, N. Nunalee, and K. R. Shull].</p>
<p>"Diffusion of Protein in Polymer Solutions: A Comparison Between Neutron Spin-Echo Spectroscopy and NMR Measurements." <i>Polymer Preprints</i>, 45, 788-789 (2004) [with X. Guo, R. Biehl, C. R. Pacheco, M. Monkenbusch, D. Richter, and L. Fu].</p>
<p>"Model Associative Polymer Networks Generated by Inclusion Interaction Between Polymers with Cyclodextrin and Hydrophobic Grafts." <i>Polymer Preprints</i>, 45, 602-603 (2004) [with X. Guo, A. A. Abdala, S. F. Lincoln, and S. A. Khan].</p>
<p>"Fluctuations of Bare Membranes and Their Modification on Incorporation of Polymers Having Equally Spaced Anchors." <i>Physica B-Condensed Matter</i>, 350, 217-219 (2004) [with X. S. Hu, R. Biehl, M. Monkenbusch, and J. Lal].</p>
<p>"Effects of Organic Solvents on the Scission Energy of Rodlike Micelles." <i>Langmuir</i>, 20, 8970-8974 (2004) [with W. Siritwatwechakul, T. LaFleur, and P. Sullivan].</p>
<p>"Diffusion of Compact Macromolecules Through Polymer Meshes: Mesh Dynamics and Probe Dynamics." <i>Physica B-Condensed Matter</i>, 350, 76-78 (2004) [with R. Biehl, X. Guo, M. Monkenbusch, J. Allgeier, and D. Richter].</p>
<p>"Differential Scanning Calorimetry Studies of Clathrate Hydrate Formation." <i>J. Phys. Chem. B</i>, 108, 16717-16722 (2004) [with Y. Zhang, P. G. Debenedetti, and B. A. Pethica].</p>
<p>"Crystallization of Mixed Paraffin from Model Waxy Oils and the Influence of Micro-Crystalline Poly(Ethylene-Butene) Random Copolymers." <i>Energy & Fuels</i>, 18, 930-937 (2004) [with X. Guo, B. A. Pethica, J. S. Huang, D. H. Adamson, and L. J. Fetters].</p>
<p>"Crystallization of Long-Chain <i>n</i>-Paraffins from Solutions and Melts as Observed by Differential Scanning Calorimetry." <i>Macromolecules</i>, 37, 5638-5645 (2004) [with X. Guo, B. A. Pethica, and J. S. Huang].</p>
<p>"Latex Composite Membranes: Structure and Properties of the Discriminating Layer." <i>J. Mem. Sci.</i>, 231, 57-70 (2004) [with S. Ramakrishnan, C. J. McDonald, and J. D. Carbeck].</p>
<p>2003</p>
<p>"Association of Hydrophobically-Modified Poly(Ethylene Glycol) with Fusogenic Liposomes." <i>Biochimica et Biophysica ACTA</i>, 1616, 184-195 (2003) [with D. T. Auguste, P. L. Ahl, P. Meers, and J. Kohn].</p>
<p>"Flash Nanoprecipitation of Organic Actives and Block Copolymers Using a Confined Impinging Jets Mixer." <i>Australian J. Chem.</i>, 56, 1021-1024 (2003) [with B.K. Johnson].</p>
<p>"Chemical Processing and Micromixing in Confined Impinging Jets." <i>AIChE J.</i>, 49, 2264-2282 (2003) [with B.K. Johnson].</p>

<p>"Mechanism for Rapid Self-Assembly of Block Copolymer Nanoparticles." <i>Phys. Rev. Lett.</i>, 91, 118302, (2003) [with B. K. Johnson].</p>
<p>"Aqueous Suspension of Nanoparticles Comprising an Agrochemical Active Ingredient." U.S. Patent #6,638,994, October 28, 2003 [with R. Crooks, M. Joanicot, and J. Coret].</p>
<p>"Amphoteric Stabilization of Crude Petroleum." U.S. Patent #6,566,454, May 20, 2003 [with H. S. Ashbaugh].</p>
<p>"Aqueous Suspension of Nanoparticles Comprising an Agrochemical Active Ingredient." U.S. Patent #6,638,994, October 28, 2003 [with R. Crooks, M. Joanicot, and J. Coret].</p>
<p>2002</p>
<p>"Dynamics of Hydrophobically Modified Polymer Doped Surfactant Bilayers: A Neutron Spin Echo Study." <i>Neutron Spin Echo Spectroscopy, Basics, Trends and Applications</i>, F. Mezei, C. Pappas, and T. Gutberlet, (Eds.), Springer-Verlag (Berlin Heidelberg), pp. 312-324 (2002) [with B. -S. Yang, J. Lal, M. Mihailescu, M. Monkenbusch, D. Richter, J. S. Huang and W. B. Russel].</p>
<p>"Detection of Water-Ice Transition Using a Lead Zirconate Titanate/Brass Transducer." <i>J. Appl. Phys.</i>, 92, 106-111 (2002) [with X. -P. Li, W. Y. Shih, J. S. Vartuli, D. L. Milius, I. A. Aksay, and W. H. Shih].</p>
<p>"Neutron Spin-Echo Study of Dynamics of Hydrophobically Modified Polymer-Doped Surfactant Bilayers." <i>Langmuir</i>, 18, 6-13 (2002) [with B. -S. Yang, J. Lal, M. Mihailescu, M. Monkenbusch, D. Richter, J. S. Huang, and W. B. Russel].</p>
<p>"Preparation and Characterization of Molecular Weight Fractions of Guar Galactomannans Using Acid and Enzymatic Hydrolysis." <i>Intl. J. Biological Macromolecules</i>, 31, 29-35 (2002) [with Y. Cheng and K. M. Brown].</p>
<p>"Measurement of Forces Between Galactomannan Polymer Chains: Effect of Hydrogen Bonding." <i>Macromolecules</i>, 31, 10155,-10161 (2002) [with Y. Cheng, J. Chik, and D. C. Rau].</p>
<p>"Diffusion of Mesoscopic Probes in Aqueous Polymer Solutions Measured by Fluorescence Recovery After Photobleaching." <i>Macromolecules</i>, 35, 8111-8121 (2002) [with Y. Cheng and J. L. Thomas].</p>
<p>"Flow Improvement of Waxy Oils Mediated by Self-Aggregating Partially Crystallizable Diblock Copolymers." <i>J. Rheol.</i>, 46, 76-776 (2002) [with H. S. Ashbaugh, L. J. Fetters, and D. H. Adamson].</p>
<p>"Gelation of "Catanionic" Vesicles by Hydrophobically Modified Polyelectrolytes." <i>Coll. Poly. Sci.</i>, 280, 783-788 (2002) [with H. S. Ashbaugh and K. Boon].</p>
<p>"Interaction of Paraffin Wax Gels with Random Crystalline/Amorphous Hydrocarbon Copolymers." <i>Macromolecules</i>, 35, 7044-7053 (2002) [with H. S. Ashbaugh, A. Radulescu, D. Schwahn, D. Richter, and L. J. Fetters].</p>
<p>"Characterization and Intermolecular Interactions of Hydroxypropyl Guar Solutions." <i>Biomacromolecules</i>, 3, 456-461 (2002) [with Y. Cheng and K. M. Brown].</p>

<p>“Interactions Between Hydrophobically Modified Polymers and Surfactants: A Fluorescence Study.” <i>Langmuir</i>, 18, 3860-3864 (2002) [with S. Panmai, D. G. Peiffer, S. Jockusch, and N. J. Turro].</p>
<p>“Compositions for Fracturing Subterranean Formations.” U.S. Patent #6,428,995, August 6, 2002 [with R. M. Kelly, S. A. Khan, P. Leduc, and A. Tayal].</p>
<p>2001</p>
<p>“Investigating the Microenvironments of Inhomogeneous Soft Materials with Multiple Particle Tracking.” <i>Phys. Rev. E</i>, 64, 061506 (2001) [with M. T. Valentine, P. D. Kaplan, D. Thota, J. C. Crocker, T. Gisler, M. Beck, and D. Weitz].</p>
<p>“Rheology and Rheological Techniques.” <i>Curr. Opin. Colloid Interface Sci.</i>, 6, 421-422 (2001) [with N. J. Wagner].</p>
<p>“Stabilization of Phosphatidyleserine/Phosphatidylethanolamine Liposomes with Hydrophilic Polymers Having Multiple ‘Sticky Feet’.” <i>Langmuir</i>, 17, 7713-7716 (2001) [with M. L. Hwang, J. Kohn, and J. L. Thomas].</p>
<p>“Interaction of Surfactant Lamellar Phase and a Strictly Alternating Comb-Graft Amphiphilic Polymer Based on PEG.” <i>Langmuir</i>, 17, 6692-6698 (2001) [with B. -S. Yang, J. Lal, J. Kohn, J. S. Huang, and W. B. Russel].</p>
<p>“Interaction of Hydrophobically Modified Polymers and Surfactant Lamellar Phase.” <i>Langmuir</i>, 17, 5834-5841 (2001) [with B.-S. Yang, J. Lal, P. Richetti, C. M. Marques, and W. B. Russel].</p>
<p>“Cure Depth in Photopolymerization: Experiments and Theory.” <i>J. Mater. Res.</i>, 16, 3536-3544 (2001) [with J. H. Lee and I. A. Aksay].</p>
<p>“Dissolution and Gelation of κ-carrageenan.” In <i>Biopolymers from Polysaccharides and Agropoteins</i>, R. A. Gross, and C. Scholz, (Eds.), ACS Symposium Series, 786, ACS, Washington, DC (2000) [with S. Ramakrishnan].</p>
<p>“Stability and Behavior of a Comb-Graft Copolymer Stabilizing a Thin Oil Emulsion Film.” <i>Polym. Adv. Technol.</i>, 12, 70-84 (2001) [with M. R. Anklam and D. A. Saville].</p>
<p>“Compositions for Fracturing Subterranean Formations.” U.S. Patent #6,197,730, March 6, 2001 [with R. M. Kelly, S. A. Khan, P. Leduc, A. Tayal]</p>
<p>“Method for Preparation of Ceramic Articles.” U.S. Patent #6,197,843, March 6, 2001 [with G. D. Rose, G. D. McCann, D. L. Schmidt, I. A. Aksay, and R. Garg].</p>
<p>“Enzyme Immobilization by Imbibing an Enzyme Solution into Dehydrated Hydrocolloid Gel Beads.” U.S. Patent #6,268,191, July 31, 2001 [with C. -A. Cukras and H. A. Pfeffer].</p>
<p>“Controlled Architecture Ceramic Composites by Stereolithography.” U.S. Patent #6,283,997, September 4, 2001 [with R. Garg, I. A. Aksay, V. F. Janas, K. S. TenHuisen, and S. T. Huxel].</p>
<p>“Multilayer Ceramic Piezoelectric Laminates with Zinc Oxide Conductor.” U. S. Patent #6,329,741. December 11, 2001 [with J. S. Vartuli, D. L. Milius, X. Li, W. H. Shih, W. Y. Shih, and I. A. Aksay]</p>

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"Enzymatic Degradation of Guar and Substituted Guar Galactomannans." *Biomacromolecules*, **1**, 782-788 (2000) [with Y. Cheng].

"Dynamic Deformation Visualization in Swelling of Polymer Gels." *Chem. Eng. Sci.*, **55**, 3335-3340 (2000) [with E. C. Achilleos, K. N. Christodoulou, K. R. Gee, and I. G. Kevrekidis].

"Quantifying Deformation in Gel Swelling: Experiments and Simulations." *AIChE J.*, **46**, 2128-2139 (2000) [with E. C. Achilleos, I. G. Kevrekidis, K. N. Christodoulou, and K. R. Gee].

"Effect of Solvent Quality and Ions on the Rheology and Gelation of κ -Carrageenan." *J. Rheology*, **44**, 885-896 (2000) [with S. Ramakrishnan].

"Behavior of κ -Carrageenan in Glycerol and Sorbitol Solutions." *Carb. Polym.*, **43**, 327-332 (2000) [with S. Ramakrishnan].

"Material Synthesis by Polymerization in Surfactant Mesophases." In *Reactions and Synthesis in Surfactant Systems*, J. Texter, ed., Marcel Dekker, Inc., NY, Ch. 26, (2000) [with E.J. Paul].

"Dynamics of Hydrophobically Modified Polymer Doped Surfactant Bilayers: A Neutron Spin-Echo Study." In *Lecture Notes in Physics*, T. Gutberlet, ed., Springer Pub., Berlin, (2000) [with B.-S. Yang, J. Lal, M. Mihailescu, M. Monkenbusch, D. Richter, J.S. Huang, and W.B. Russel].

"Preparation of Protein Microparticles by Supercritical Fluid Precipitation." U.S. Patent #6,063,910, May 16, 2000 [with P. G. Debenedetti and G. -B. Lim].