

10. MRSEC Supported Publications and Patents
(May 1, 2001 - April 30, 2002)

Publications resulting from PRIMARY MRSEC Support

IRG 1 - Microstructured Polymers

A Simple and Mild Route to Highly Fluorinated Model Polymers. Ren, Y.; **Lodge, T.P.**; **Hillmyer, M.A.** *Macromolecules* **2001**, *34*, 4784.

*Comparison of Original and Cross-linked Wormlike Micelles of Poly(ethyleneoxide-*b*-butadiene) in Water: Rheological Properties and Effects of Poly(ethyleneoxide) Addition.* Won, Y.-Y.; Paso, K.; Davis, H.T.; **Bates, F.S.** *J. Phys. Chem. B.* **2001**, *105*, 8302.

Homogenous Reactive Coupling of Terminally Functional Polymers. Orr, C.A.; Cernohous, J.J.; Guegan, P.; Hirao, A.; Jeon, H.K.; **Macosko, C.W.** *Polymer* **2001**, *42*, 8171.

Preparation, Stability, and in vitro Performance of Vesicles made with Diblock Copolymers. Lee, J.C-M; Bermudez, H.; Discher, B.M.; Sheehan, M.; Won, Y-Y; **Bates, F.S.**; Discher, D.E. *Biotechnol. Bioeng.* **2001**, *73*, 135.

Shear-induced Nanostructure-Microstructure Transition in a Polymeric Bicontinuous Microemulsion. Krishnan, K.; Almdal, K.; **Lodge, T.P.**; **Bates F.S.**; Burghardt, W. *Phys. Rev. Lett.* **2001**, *87*, 098301.

Static and Dynamic Scattering from Ternary Polymer Blends: Bicontinuous Microemulsions, Lifshitz Lines and Amphiphilicity. Morkved, T.L.; Stepanek, P.; Krishnan, K.; **Bates, F.S.**; **Lodge, T.P.** *J. Chem. Phys.* **2001**, *114*, 7247.

Effects of Shear Flow on a Polymeric Bicontinuous Microemulsion: Equilibrium and Steady State Behavior. Krishnan, K.; Chapman, B.; **Bates, F.S.**; **Lodge, T.P.**; Almdal, K.; Burghardt, W.R. *J. Rheology* **2002**, *46*, 529.

Synthesis and Self-assembly of Fluorinated Block Copolymers. **Hillmyer, M.A.**; **Lodge, T.P.** *J. Polym. Sci., Polym. Chem. Ed.* **2002**, *40*, 1.

Cryogenic Transmission Electron Microscopy (CryoTEM) of Micelles and Vesicles Formed in Water by Poly(ethyleneoxide)-Based Block Copolymers. Won, Y.-Y.; Brannan, A.K.; Davis, H.T.; **Bates, F.S.** *J. Phys. Chem. B.*, in press.

Linear Viscoelasticity of a Polymeric Bicontinuous Microemulsion. Burghardt, W.R.; Krishnan, K.; **Bates, F.S.**; **Lodge, T.P.** *Macromolecules*, in press.

*The Effect of Selective Perfluoroalkylation on the Segregation of Poly(styrene-*b*-1,2 butadiene) Copolymers.* Ren, Y.; **Lodge, T.P.**; **Hillmyer, M.A.** *Macromolecules*, in press.

The Role of Competitive PEO-Water and Water-Water Hydrogen Bonding in Aqueous Solution PEO Behavior. Dormidontova, E.E. *Macromolecules*, in press.

IRG 2 - Artificial Tissues

Adhesion of $\alpha 5\beta 1$ Receptors to Biomimetic Substrates Constructed from Peptide Amphiphiles. Dillow, A.K.; Ochsenhirt, S.E.; McCarthy, J.B.; Fields, G.B.; Tirrell, M. *Biomaterials* **2001**, *22*, 1493.

Enhanced Fibrin Remodeling In Vitro for Improved Tissue-Equivalents. Neidert, M.R.; Lee, E.; **Oegema, T.R.**; **Tranquillo, R.T.** *Biomaterials*, in press.

Interaction Between Bioactive Glasses and Human Dentin. Efflandt, S.E.; Magne, P.; Douglas, W.H.; **Francis, L.F.** *Journal of Materials Science-Materials in Medicine*, in press.

Porous Polymer/Bioactive Glass Composites for Soft-to-Hard Tissue Interfaces. Zhang, K.; Ma, Y.; **Francis, L.F.** *Journal of Biomedical Materials Research*, in press.

IRG 3 - Magnetic Heterostructures

Electronic Structure of the Ni₂MnIn/InAs (100) Interface Relevant to Spin Injection. Kilian, K.A.; **Victoria, R.H.** *IEEE Trans. Mag.* **2001**, 37, 1976.

Exchange Bias in Macroporous Co/CoO. Krivorotov, I.N.; Yan, H.; **Dahlberg, E.D.**; **Stein, A. J.** *Magn. Magn. Mater.* **2001**, 226, 1800.

Exchange Field Induced Magnetoresistance in Colossal Magnetoresistance Manganites. Krivorotov; I.N., Nikolaev, K.R., Dobin, A. Yu; **Goldman, A.M.**; **Dahlberg, E.D.** *Phys. Rev. Lett.* **2001**, 86, 5779.

First Principles Description of the Paramagnetic Insulating State of Chromia. Dobin, A.; **Wentcovitch, R.M.** *J. Appl. Phys.* **2001**, 89, 7201.

Temperature Dependence of the Interlayer Exchange Coupling in Manganite-based Superlattices. Nikolaev, K.R.; Dobin, A. Yu.; Krivorotov, I.N.; **Dahlberg, E.D.**; **Goldman, A.M.** *J. Appl. Phys.* **2001**, 89, 6820.

Characterization of Domain States in Submicron Sized Permalloy Particles with Perpendicular Anisotropy. Eames P.; **Dahlberg, E.D.** *J. Appl. Phys.* in press.

Magnetization Reversal in Exchange Biased Co/CoO probed with Anisotropic Magnetoresistance. Gredig, T.; Krivorotov, I.N.; **Dahlberg, E.D.** *J. Appl. Phys.* in press.

Optically Pumped Transport in Ferromagnet-Semiconductor Schottky Diodes, Isakovic, A.F.; Carr, D.M.; Strand, J.; Schultz, B.D; **Palmstrøm, C.J.**; **Crowell, P. A.** *J. Appl. Phys.*, in press.

Quantitative Micromagnetics Simulation of Exchange Bias in the NiFe/NiMn System. Kilian, K.A.; **Victoria, R.H.** *IEEE Trans. Mag.*, in press.

Relation Between Exchange Anisotropy and Magnetization Reversal Asymmetry in Fe/MnF₂ Bilayers. Krivorotov, I.N.; **Leighton, C.**; Nogues, J.; Schuller, I.K.; **Dahlberg, E.D.** *Phys. Rev. B. Rapid Comm.*, in press.

Role of Magnetic Aftereffect in Coercivity Enhancement of Co/CoO Bilayers, Krivorotov, N.; Gredig, T.; Nikolaev, K.R.; **Goldman, A.M.**; **Dahlberg, E.D.** *Phys. Rev. B*, in press.

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Direct Synthesis of Ordered Macroporous Silica Materials Functionalized with Polyoxometalate Clusters. Schroden, R.C.; Blanford, B.J.; Melde, B.J.; Johnson, S.; **Stein, A.** *Chem. Mater.* **2001**, 13, 1074.

Exchange Bias in Macroporous Co/CoO. Krivorotov, I.N.; Yan, H.; **Dahlberg, E.D.**; **Stein, A. J.** *Magn. Magn. Mater.* **2001**, 226, 1800.

Hydrostatic-pressure Dependence of the Photoconductivity of Single-crystal Pentacene and Tetracene. Rang, Z.; Haraldsson, A.; Kim, D.M.; Ruden, P.P.; Nathan, M.I.; Chesterfield, R.J.; **Frisbie, C.D.** *Appl. Phys. Lett.* **2001**, 79, 2731.

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Self-modification of Spontaneous Emission by Inverse Opal Silica Photonic Crystals. Schroden, R.C.; Al-Daous, M.; **Stein, A.** *Chem. Mater.* **2001**, *13*, 2945.

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Vibrational Mode Analysis of Isomorphous Hydrogen-bonded Guanidinium Sulfonates with Inelastic Neutron Scattering and Density Functional Theory. Pivovar, A.M.; **Ward, M.D.**; Yildirim, T.; Neumann, D.A. *J. Chem. Phys.* **2001**, *115*, 1909.

Analysis of Radiation Forces in Laser Trapping and Laser-guided Direct Writing Applications. Nahmias, Y.K.; **Odde, D.J.** *IEEE Journal of Quantum Electronics* **2002**, *38*, 131.

A π -Stacking Terthiophene-Based Quinodimethane is an n-Channel Conductor in a Thin Film Transistor. Pappenfus, T.M.; Chesterfield, R.J.; **Frisbie, C.D.**; Mann, K.R.; Casado, J.; Raff, J.D.; **Miller L.L.** *J. Am. Chem. Soc.*, in press.

Design and Analysis of Chain and Network Structures from Organic Derivatives of Polyoxometalate Clusters. Johnson, B.J.; Schroden, R.C.; Zhu, C.; Young, Jr., V.G.; **Stein, A.** *Inorg. Chem.*, in press.

Nano- and Microscale Manipulation of Biological Particles by Laser-guided Direct Writing. Gao, B.Z.; Fass, J.N.; Renn, M.J.; **Odde, D.J.** *Proceedings of the SPIE*, in press.

Probing Vibrational Dynamics of Hydrogen-bonded Inclusion Compounds with Inelastic Neutron Scattering and Ab Initio Calculations. Pivovar, A.M.; **Ward, M.D.**; Brown, C.M.; Neumann, D.A. *J. Phys. Chem. B*, in press.

Self-assembly of Crystalline Lattices. **Ward, M.D.**; Pivovar, A.M. *Encyclopedia of Materials: Science and Technology*, in press.

Publications resulting from PARTIAL MRSEC Support

IRG 1 - Microstructured Polymers

Adhesion Enhancement via Crystalline-embedded Entanglements in Melt-processed Layered Structures. Cole, P.J.; **Macosko, C.W.** *Mater. Res. Soc. FF8.6.1* **2000**, 629.

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Electromechanical Limits of Polymersomes. Aranda-Espinoza, H.; Bermudez, H.; **Bates, F.S.**; Discher, D. *Phys. Rev. Lett.* **2001**, 87, 208301.

Homogeneous Reactive Coupling of Terminally Functional Polymers. Orr, C.A.; Cernohous, J.; Guégan, P.; Hirao, A.; Jeon, H.K.; **Macosko, C.W.** *Polymer* **2001**, 42, 8171.

Mesoporous Polystyrene Monoliths. Zalusky, A.S.; Olayo-Valles, R.; Taylor, C.J.; **Hillmyer, M.A.** *J. Am. Chem. Soc.* **2001**, 123, 1519.

The Order-Disorder Transition and the Disordered Micelle Phase in Sphere-forming Block Copolymer Melts. Dormindontova, E.; **Lodge, T.P.** *Macromolecules* **2001**, 34, 9143.

From Membranes to Melts, Rouse to Reptation: Diffusion in Polymersome versus Lipid Bilayers. Lee, J. C.-M.; Santore, M.; **Bates, F.S.**; Discher, D.E. *Macromolecules* **2002**, 35, 323.

Molecular Weight Effects in the Hydrogenation of Model Polystyrenes Using Platinum Supported on Wide Pore Silica. Ness, J.S.; Brodil, J.C.; **Bates, F.S.**; Hahn, S.F.; Hucul, D.A.; **Hillmyer, M.A.** *Macromolecules* **2002**, 35, 602.

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IRG 2 - Artificial Tissues

Collagen Architecture and Failure Processes in Bovine Patellar Cartilage. **Lewis, J.L.**; Johnson, S.L. *J. Anat.*, **2001**, 199, 483.

Coupled Macroscopic and Microscopic Scale Modeling of Fibrillar Tissues and Tissue Equivalents. Agoram, B.; **Barocas, V.H.** *J. Biomech. E.* **2001**, 123, 362.

In Vitro Hydroxycarbonate Apatite Mineralization of CaO-SiO₂ Sol-Gel Glasses with a Three-dimensionally Ordered Macroporous Structure. Yan, H.; Zhang, K.; Blandford, C.; **Francis, L.F.**; **Stein, A.** *Chem. Mater.* **2001**, 13, 1374.

Microscopic and Calorimetric Assessment of Freezing Processes in Uterine Fibroid Tumor Tissue. Devireddy, R.; **Bischof, J.** *Cryobiology* **2001**, 42, 224.

Self-assembly of Model Collagen Peptide Amphiphiles. Gore, T.; Dori, Y.; Talmon, M.; Tirrell, M.; Bianco-Peled, H. *Langmuir*, **2001**, 17, 5352.

Technique for Estimating Fracture Resistance of Cultured Neocartilage. Oyen-Tiesma, M.; **Cook, R.F.** *J. Mater. Sci.: Mater. in Medicine* **2001**, 12, 327.

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Interactive Biointerfacial Strategies, Tissue Engineering and Drug Delivery. Dillow, A.; Ochsenhirt, S.; Tirrell, M. *Biomimetic Materials and Design*, in press.

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IRG 3 - Magnetic Heterostructures

Control of Magnetic Anisotropy in $Fe_{1-x}Co_x$ Films on Vicinal GaAs and $Sc_{1-y}Er_yAs$ Surfaces. Isakovic, A.F.; Berezovsky, J.; **Crowell, P.A.**; Chen, L.C.; Carr, D.M.; Schultz, B.D.; **Palmstrøm, C.J.** *J. Appl. Phys.* **2001**, 89, 6674.

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Gems of Chemistry and Physics: Three-dimensionally Ordered Macroporous (3DOM) Metal Oxides. Blanford, C.F.; Yan, H.; Schroden, R.C.; Al-Daous, M.; **Stein, A.** *Adv. Mater.* **2001**, 13, 401.

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Sphere Templating Methods for Periodic Porous Solids. **Stein, A.** *Micropor. Mesopor. Mater.* **2001**, 44, 227.

The Role of Surfactants and Amphiphiles in the Synthesis of Porous Inorganic Solids. **Stein, A.**; Melde, B., in *Reactions and Synthesis in Surfactant Systems*, Texter, J., Ed.; Marcel Dekker: New York **2001**, 819.

Publications resulting from the USE OF SHARED FACILITIES

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Anionic Synthesis and Detection of Fluorescence-labeled Polymers with a Terminal Anhydride Group. Moon, B.; Hoye, T.R.; **Macosko, C.W.** *J. Polymer Science, Part A, Polymer Chem.* **2000**, *38*, 2177.

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Mesoporous Polystyrene Monoliths. Zalusky, A.S.; Olayo-Valles, R.; Taylor, C.J.; **Hillmyer, M.A.** *J. Am. Chem. Soc.* **2001**, *123*, 151.

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IRG 2 - Artificial Tissues

Ligand Accessibility as Means to Control Cell Response to Bioactive Bilayer Membranes. Dori, Y.; Bianco-Peled, H.; Satija, S.K.; Fields, G.B.; McCarthy, J.B.; Tirrell, M. *J. Biomed. Mater. Res.* **2000**, 50, 75.

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Seed

Surface Modification of Mesoporous, Macroporous, and Amorphous Silica with Catalytically Active Polyoxometalate Clusters. Johnson, B.S.S.; **Stein, A.** *Inorg. Chem.* **2001**, 40, 801.

MRSEC Supported Patents

None