

EDWARD T. SAMULSKI
Cary C. Boshamer Professor

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10/2016

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Education:

B.S., Clemson University, 1965

Ph.D., Princeton University, 1970

Professional Positions

- 1994 - Cary C. Boshamer Professor of Chemistry (endowed chair), UNC- CH
- 2005 - 2006 Jefferson Science Fellow, US Department of State
<http://www.chem.unc.edu/news/samulski.html>
- 2002 - Co-Director of NASA Institute on Biologically Inspired Materials (BIMat)
<http://bimat.princeton.edu/html/team.html>
- 2002 - International Board of the MacDiarmid Institute for Advance Materials and Nanotechnology
<http://www.macdiarmid.ac.nz/>
- 1995 - 2000 Chair, Department of Chemistry, University of North Carolina
- 1988 to date Professor, Department of Chemistry, University of North Carolina
- 1981 - 1988 Professor, University of Connecticut, Storrs
- 1985 - 1986 Science & Engineering Research Council Senior Visiting Fellow,
Cavendish Lab, Cambridge University
- 1984 January Visiting Professor, Weizmann Institute of Science; Rehovot, Israel
- 1982 January Visiting Scientist, IBM Research Labs, San Jose, CA
- 1975 - 1981 Associate Professor, University of Connecticut, Storrs
- 1979 Jan.-Oct. Visiting Professor, Weizmann Institute of Science; Rehovot, Israel
- 1978 June-Dec Visiting Professor, Laboratory of Solid State Physics, University of
Paris (Sud); Orsay
- 1972 - 1975 Assistant Professor, University of Connecticut, Storrs
- 1971 - 1972 Postdoctoral Fellow, University of Texas; Austin (with Chas. G. Wade)
- 1969 - 1970 NIH Postdoctoral Fellow, University of Groningen; The Netherlands (with H. Berendsen)
- 1967 summer Allied Chemical Corporation; Morristown, New Jersey
- 1965 summer E. I. DuPont de Nemours Company, Savannah River Laboratory; Aiken, SC

Honors

- 2006 Thomas Green Clemson Academy of Engineers and Scientists
- 2005 Thomas Jefferson Science Fellowship, US Department of State
- 1997 Chair Polymer Gordon Conference, Ventura, California
- 1995 Simon Guggenheim Fellow (Massey University, New Zealand)
- 1994 Stone Award of the Carolina Piedmont Section of the ACS (Southeast Region)
- 1994 Cary C. Boshamer Professor of Chemistry (endowed chair)
- 1992 Fellow of American Association for the Advancement of Science
- 1992 Fellow of the American Physical Society
- 1990 Chair, Committee on Liquid Crystalline Polymers, NMAB, National Academy of Sciences
- 1985-1986 Science & Engineering Research Council Senior Visiting Fellow,
Cavendish Lab, Cambridge University
- 1985 Plenary Lecture, Faraday Discussion on Liquid Crystalline Polymers
- 1985 Founding Editor (with G. R. Luckhurst) of the journal *LIQUID CRYSTALS*
- 1978 Chairman, Gordon Conference on Liquid Crystals, Santa Barbara, Calif.
- 1976 President, University of Connecticut chapter of Sigma Xi
- 1973 University of Connecticut Faculty Summer Fellowship
- 1971 - 1972 NIH and Robert Welch Postdoctoral Fellow
- 1965 - 1969 Textile Research Institute Fellow, Princeton University
- 1961 - 1965 Leon Lowenstein Scholar, Clemson University

Graduate Students: (31 PhD; 8 MS)

- 1976 Ph.D. "Synthesis of Poly(substituted tetrathiafulvalenes)"; **N.G. Demetriadis**
- 1978 Ph.D. "The Molecular Morphology of Polyethylene via Nuclear Magnetic Resonance";
K. M. Natarajan
- 1978 Ph.D. "Excimer Fluorescence in Synthetic Polypeptides"; **J. T. Chapin**
- 1978 M.S. "Synthesis and Nuclear Magnetic Resonance Study of Selectively Deuterated
Poly(benzyl-L-glutamate)"; **J. H. Kwiatkowski**
- 1978 Ph.D. "Synthesis and Characterization of Thermotropic Polymeric Liquid Crystals";
R. Wiercinski
- 1982 Ph.D. "X-Ray Diffraction Study of Synthetic Polypeptides"; **J. A. Lefelar**
- 1984 Ph.D. "Macromolecular dynamics in Liquid Crystals and Isotropic Melts;" **L. P. Yu**
- 1986 Ph.D. "Deuterium NMR Studies of Oriented Fluid Polymers;" **A. I. Nakatani**
- 1986 Ph.D. "Effects of Pressure on Polymeric Liquid Crystals;" **B. Hsiao**
- 1986 Ph.D. "Mesogen Structure and Novel Liquid Crystals;" **M. Poliks**

- 1986 Ph.D. "Rodlike Superionic Conducting Polymers;" **Y. W. Park**
- 1990 Ph.D. "Thiophene-based Liquid Crystalline Polymers"; **R. Cai**
- 1990 M.S. "Self-assembly of helices on gold," **K. Mar**
- 1991 Ph.D. "Gel formation in poly(benzyl-L-glutamate) and benzyl alcohol," **J. G. L. Pluyter**
- 1991 Ph.D. "NLO-active polypeptide derivatives: SHG study of films from lyotropic phases"; **M.Y. Jin**
- 1993 Ph.D. "2,5-Thiophene-based liquid crystalline poly(amide)s, poly(arylene ether ketone)s, and poly(benzamidazole)s"; **S. Stompel**
- 1993 M.S. "Preparation of CdS Nanocrystals within an Ordered Polypeptide Matrix" **E. J. Nelson**
- 1993 Ph.D. "α-Helical polypeptide monolayers" **E. P. Enriquez**
- 1995 Ph.D. "Orientation in block copolymers and fibers" **Julie Hutchinson**
- 1995 Ph.D. "Nonlinear Optical Phenomena in Polymers and Liquid Crystals" **Hanlin Wang** (joint w Jarnagin)
- 1995 M.S. "Synthesis of NLO-active Liquid Crystals" **Yalie Liu**
- 1998 Ph.D. "New all-aromatic Liquid Crystalline Polymers" **Theo Dingemans**
- 1998 Ph.D. "Rigid rod-like NLO-active polymers" **Darlene K. Taylor**
- 1999 M.S. "Substrates for Combinatorial Synthesis" **Kelley Boyle**
- 2000 M.S. "Nonlinear Liquid Crystals" **Tim Dunkin**
- 2000 M.S. "Structure-Property Relations in Liquid Crystals" **Liang Hong**
- 2000 Ph.D. "Characterization of Polymers and Amphiphiles in Dense CO₂" **Jim McClain** (joint w DeSimone)
- 2003 Ph.D. "Fluorocarbon-carbon dioxide interactions via F-19 NMR" **Clarence Murray**
- 2006 Ph.D. "Nanostructures from templates" **Lei Zhang**
- 2006 Ph.D. "Intercalation of clay with CO₂" **Qian Zhao**
- 2006 Ph.D. "Anchoring liquid crystals on substrates" **Joette Russell**
- 2004 M.S. "PDMS networks via deuterium NMR" **Danna O'Leary Knott**
- 2008 Ph.D. "Fluoropolymer composites" **Jinron Liu** (joint with Ashby)
- 2008 Ph.D. "New mesogen architectures" **Nick Zafiropolous** (joint with Lin)
- 2010 Ph.D. "Nanopatterning with PFPE elastomers: Materials and photovoltaic applications" **Stuart Williams** (joint with DeSimone)
- 2010 Ph.D. "Liquid Crystal Alignment on Embossed Polymer Films" **Walter Schenk**
- 2010 Ph.D. "Photronic Crystal Structure in Photovoltaic Cells" **Do Hyun Ko**
- 2013 Ph.D. "Patterning Metals Oxides for Solar Cells" **Myoung Rhul Ok**
- 2015 Ph.D. "Structure and dynamics studies using Nuclear Magnetic Resonance: From simple liquids to extreme networks" **Leah Marie Heist**

Postdoctoral Research Associates and Visiting Collaborators: (37)

- 1974-6 Dr. H. T. Edzes (University of Groningen; The Netherlands)
- 1977 Dr. N. G. Demetriadis (University of Connecticut)

1979 Dr. K. Czarniecka (Jagiellonian University; Poland)
 1980 Dr. B. Deloche (University of Paris; Orsay, France)
 1981-3 Dr. H. Toriumi (Tokyo Institute of Technology; Japan)
 1985-6 Dr. B. Janik (Jagiellonian University; Cracow, Poland)
 1989 Dr. C. Vieth (MIT)
 1989-90 Dr. H. Toriumi (Univ. Tokyo)
 1989 Dr. J. Fukasawa (KAO Corp.)
 1989-95 Dr. C-D. Poon (Univ. Oklahoma)
 1989-- Professor D. Photinos (Univ. Patras, Greece)
 1992 Dr. H. Duk (UNC Chapel Hill)
 1992-3 Dr. R. Scott Archibald (Univ. Wisconsin) [joint with J. DeSimone]
 1993-4 Dr. Jun-Lin (Univ. Penn./Univ. Texas) [joint with J. DeSimone]
 1994-7 Dr. Yuhua Li (Clemson University)
 1994-5 Dr. Andreas Terzis (Univ. Patras, Greece)
 1995-6 Dr. Klaus Semmler (Univ. Freiburg)
 1995-7 Dr. A. Dardin (Univ. Mainz) [joint with J. DeSimone]
 1995-6 Dr. A. Chen (UNC Chapel Hill)
 1997-9 Dr. Sueng Kang (KIST)
 1998 Professor Zeev Luz (Weizmann Institute)
 1998-9 Dr. Etshushi Nishikawa (Freiburg University)
 1999 Professor Craig Eccles (Massey University)
 2000 Dr. Christoph Wutz (Darmstadt)
 2000 - 01 Dr. Chad Booth (Univ. So. Miss.)
 2000 - 08 Dr. Bin Cheng (Univ. Sci. & Tech. China)
 2001 Dr. Jirakorn Thisayukta (Tokyo Inst. Tech.)
 2002 -6 Dr. Louis Madsen (Cal. Tech.)
 2003 Professor E-Joon Choi (Kumoh Nat'l Inst. Tech., Korea)
 2003 - 4 Dr. Wensheng Shi (City Univ. Hong Kong)
 2006 Professor Eric Scharrer (sabbatic leave; Univ. Puget Sound)
 2006 Professor Young W. Park (sabbatic leave Yeongsang national University)
 2007- 11 Dr. Yongchao Si (Univ. Connecticut)
 2007-8 Dr. Lei Zhang (UNC Chapel Hill)
 2009- 11 Dr. Agata Klebowska (Univ. Warsaw)
 2010- 14 Dr. Abay Dinku (Linköping University, Institute of Technology, Sweden)
 2010- 11 Dr. Mukti Aryal (University of Texas, Arlington)

Publications

Refereed Journal Articles (250) and **Book Chapters, Review Articles and Misc.** (26) and **Patents** (75)

Refereed works include four (4) *letters* in *Nature*, six (6) in *Physical Review Letters*, and three (3) in *Science*.

- “Some Ethoxides of Neptunium”, E. T. Samulski and D. G. Karraker, *J. Inorganic and Nuclear Chemistry* **29**, 993-999 (1967).
- “Solid ‘Liquid Crystal’ Films of Poly(Benzyl-L-Glutamate)”, E. T. Samulski and A. V. Tobolsky, *Nature* **216**, 997-999 (1967).
- “Some Unusual Properties of Poly(Benzyl-L-Glutamate) Films Cast in Strong Magnetic Fields”, E. T. Samulski and A. V. Tobolsky, *Macromolecules* **1**, 555-557 (1968).
- “The Liquid Crystal Phase of Poly(Benzyl-L-Glutamate) in Solution and in the Solid State”, E. T. Samulski and A. V. Tobolsky, *Molecular Crystals & Liquid Crystals* **7**, 433-42 (1969).
- “Energy Transients in Harmonic Oscillator Systems”, I. L. Hopkins, E. T. Samulski, and A. V. Tobolsky, *American Journal of Physics* **38**, 226-235 (1970).
- “Solid ‘Liquid Crystalline’ Films of Synthetic Polypeptides: A New State of Matter”, E. T. Samulski and A. V. Tobolsky, *Pure and Applied Chemistry* **23**, 145-150 (1970).
- “Cholesteric and Nematic Structures of Poly(Benzyl-L-Glutamate)”, E. T. Samulski and A. V. Tobolsky, *Liquid Crystals and Ordered Fluids*, 111-121 (1970) (Plenum).
- “Distorted α -Helix for Poly(Benzyl-L-Glutamate) in the Nematic Solid State”, E. T. Samulski and A. V. Tobolsky, *Biopolymers* **10**, 1013-1019 (1971).
- “Brownian Motion Contribution to Relaxation in Nematic Liquid Crystals”, E. T. Samulski, C. R. Dybowski, and C. G. Wade, *Chem. Phys. Letters* **11**, 113-116 (1971).
- “Proton, Deuteron and Nitrogen Resonance of Dimethylformamide in Nematic Polypeptide Liquid Crystal”, E. T. Samulski and H. J. C. Berendsen, *J. Chem. Phys.* **56**, 3920-3928 (1972).
- “Frequency Sweep Adiabatic Fast Passage on the Varian HA-100”, M. Chien, E. T. Samulski, and C. G. Wade, *Review of Scientific Instruments* **43**, 1830-1832 (1972).
- “Inter- and Intramolecular Contributions to Proton Relaxation in Liquid Crystals”, E. T. Samulski, C. R. Dybowski, and C. G. Wade, *Phys. Rev. Letters* **29**, 340-344 (1972).
- “Controlled Release of Herbicides: Theory”, R. L. Collins, S. Doglia, E. T. Samulski and R. A. Mazak, *J. Weed Science Society of America* **21**(1), 1-5 (1973).
- “Nuclear Magnetic Resonance Relaxation Study of Poly(Benzyl-L-Glutamate) Side-Chain Mobility in Helix-Coil Transition”, M. Chien, E. T. Samulski, and C. G. Wade, *Macromolecules* **6**(4) 638-642 (1973).
- “Intermolecular and Intramolecular Contributions to Proton Relaxation in Liquid Crystals”, E. T. Samulski, C. R. Dybowski, and C. G. Wade, *Molecular Crystals & Liquid Crystals* **22**, 302-315 (1973).
- “NMR Free Induction Decay and Spin Echoes in Oriented Model Membrane Bilayers”, E. T. Samulski, B. A. Smith, and C. G. Wade, *Chem. Phys. Letters* **20**, 167-169 (1973).
- “Supramolecular Structural Transitions in Polypeptide Solutions: NMR Study”, W. A. Hines and E. T. Samulski, *J. Polymer Science* **C44**, 11-17 (1973).
- “Nuclear Magnetic Resonance Spin-Lattice Relaxation in the Lyotropic Polypeptide Liquid Crystal”, W. A. Hines and E. T. Samulski, *Macromolecules* **6**(5), 793-795 (1973).
- “Nuclear Magnetic Resonance in Polypeptide Liquid Crystals”, W. A. Hines and E. T. Samulski, *Liquid Crystals & Ordered Fluids* **2**, 257-266 (1974).

- “Polypeptide Liquid Crystals: Magnetic Susceptibility, Twist Elastic Constant, Rotational Viscosity Coefficient, and Poly(Benzyl-L-Glutamate) Sidechain Formation”, C. G. Sridhar, W. A. Hines, and E. T. Samulski, *J. Chem. Phys.* **61**(3), 947-953, (1974).
- “Diffusion in Oriented Lamellar Phases by Pulsed NMR”, M. Chien, E. T. Samulski, B. A. Smith, and C. G. Wade, *Proceedings of the 3rd Symposium on Ordered Fluids and Liquid Crystals, Advances in Chemistry Series 2*, (1974) (Plenum).
- “Polypeptide Sidechain Secondary Structure and the Helix-Coil Transition: An NMR Study”, E. T. Samulski, M. Chien, and C. G. Wade, *J. Polymer Science* **C46**, 335-340 (1974).
- “Polypeptide Liquid Crystals: Dimagnetic Anisotropy, Twist Elastic Constant and Rotational Viscosity Coefficient”, C. Guha, W. A. Hines, and E. T. Samulski, *Journal de Physique* **C1**, 269-272 (1975).
- “Poly(Benzyl-L-Glutamate) Helix-Coil Transition. Pretransition Phenomena in the Liquid Crystal Phase”, R. W. Duke, D. B. DuPre, W. A. Hines, and E. T. Samulski, *J. Amer. Chem. Soc.* **98**, 3094-3101 (1976).
- “Order Parameter Measurements in Polypeptide Liquid Crystals”, S. Murthy, J. R. Knox, and E. T. Samulski, *J. Chem. Phys.* **65**, 4835-4839 (1976).
- “Temperature Dependence of Order Parameter in Polypeptide Liquid Crystals”, R. W. Duke, D. B. DuPre, and E. T. Samulski, *J. Chem. Phys.* **67**, 824-830 (1977).
- “Design and Synthesis of Poly(Substituted)Tetrathiafulvalene Precursors”, N. G. Demedtriadis, S. J. Huang, and E. T. Samulski, *Tetrahedron Letters* **26**, 2223 (1977).
- “Van der Waals-Lifshitz Forces in Liquid Crystals; Origin of Cholesteric Structure” T. V. Samulski and E. T. Samulski, *J. Chem. Phys.* **66**, 2748 (1977).
- Effect of Trifluoroacetic Acid on the Viscoelastic Properties of Polypeptide Liquid Crystals”, R. W. Duke, D. B. DuPre, W. A. Hines, and E. T. Samulski, *Molecular Crystals & Liquid Crystals* **40**, 247-259 (1977).
- “Spin Diffusion and Cross Relaxation in the Proton NMR of Hydrated Collagen”, H. T. Edzes and E. T. Samulski, *Nature* **265**, 521-522 (1977).
- The Determination of the Orientational Distribution Function in Liquid Crystals by the Depolarization of Fluorescence of Probe Molecules”, L. L. Chapoy, D. B. DuPre, and E. T. Samulski, *Liquid Crystals and Ordered Fluids* **3**, 177-189 (1978) (Plenum).
- “Molecular Morphology of Polyethylene Determined By NMR”, R. Cukier, K. Natarajan, and E. T. Samulski, *Nature* **275**, 527-530 (1978).
- “The Measurement of Cross Relaxation Effects in the Proton NMR Spin-Lattice Relaxation of Water in Biological System: Hydrated Collagen and Muscle”, H. T. Edzes and E. T. Samulski, *J. Magnetic Resonance* **31**, 207-229, (1978).
- “Sidechain Order Parameters Via D NMR in Polypeptide Liquid Crystals”, E. T. Samulski, *J. de Physique Colloq.* **40**(C3), C-471-475 (1979).
- “Lyotropic Nematics: Molecular Aggregation and Susceptibilities”, J. Charvolin and E. T. Samulski, *J. de Physique Lettres* **40**, L-587-592 (1979).
- “Polypeptide Liquid Crystals: A D NMR Study”, K. Czarniecak and E. T. Samulski, *Molecular Crystals and Liquid Crystals* **63**, 205-214 (1980).
- “Constrained Chain Statistics: D NMR of Octane in a Nematic Solvent”, E. T. Samulski, *Ferroelectrics*:

- Proceedings of the International Symposium on the Statistical Mechanics of Phase Transitions in Polymers, Case Western University, 11-13 June 1980, **30**, 83-93.
- "Excimer Fluorescence in Synthetic Polypeptides", E. T. Samulski and J. T. Chapin, *Polymer Preprints* **21**, 67-81 (1980).
- "D NMR Investigation of the Blue Phase of Cholesterol Esters", Z. Luz and E. T. Samulski, *J. Chem. Phys.* **73**, 142-147 (1980).
- "Deuterium NMR and Molecular ordering in the Cholesterol Alkanoate Mesophases", Z. Luz, R. Poupko, and E. T. Samulski, *J. Chem. Phys.* **74**, 5825-5837 (1981).
- "Short-range, Nematic-like Orientational Order in Strained Elastomers: A Deuterium Magnetic Resonance Study", B. Deloche and E. T. Samulski, *Macromolecules* **14**, 575-581 (1981).
- "Orientational Ordering of Flexible Mesogenic Molecules", R. Y. Dong and E. T. Samulski, *Molec. Cryst. & Liq. Cryst. Lett.* **82**, 73-79 (1982).
- "Chain Ordering and Molecular Orientational Ordering in Liquid Crystals", E. T. Samulski and R. Y. Dong, *J. Chem. Phys.* **77**, 5090-5096 (1982).
- "Anisotropic Dispersion Interactions in Liquid Crystals", H. Toriumi and E. T. Samulski, *Mol. Cryst. & Liq. Cryst.* **101**, 163-173 (1983).
- "Alkyl Chain Flexibility in Discotic Columnar Mesophases", E. T. Samulski and H. Toriumi, *J. Chem. Phys.* **79**, 5194-5199 (1983).
- "Alkyl Chain Flexibility in Liquid Crystals", E. T. Samulski, *Israel J. Chemistry* **23**, 329-339, (1983).
- "Lyotropic Polymeric Liquid Crystals", E. T. Samulski and D. B. DuPre, *J. de Chimie-Physique* **80**, 25-30 (1983).
- "Sidechain Conformation in Poly(Phenethyl-L-Glutamate)", J. A. Lefelar, J. R. Knox, and E. T. Samulski, *Biopolymers* **22**, 1071-1086 (1983).
- "Reptation versus Tube Renewal in Polymer Melts", B. A. Smith, L.-P. Yu, E. T. Samulski and M. Winnik, *Phys. Rev. Lett.* **52**, 45-48 (1984).
- "Alkyl Chain Order in a Linear Polymeric Liquid Crystal", E. T. Samulski, M. M. Gauthier, R. B. Blumstein and A. Blumstein, *Macromolecules* **17**, 479-483 (1984).
- "Ionenomeric Liquid Crystals", L.-P. Yu and E. T. Samulski, *Ordered Fluids & Liquid Crystals* **4**, 697-704 (1984) Plenum.
- "Alkyl Chain Flexibility in Liquid Crystals", H. Toriumi and E. T. Samulski, *Ordered Fluids & Liquid Crystals* **4**, 597-613 (1984) Plenum.
- "Rheological Properties of a Thermotropic Liquid Crystalline Polyester", A. Bickle, M. T. Shaw and E. T. Samulski, *J. Rheology* **28**, 647-652 (1984).
- "Investigations of Polymer Chains in Oriented Fluid Phases with Deuterium Nuclear Magnetic Resonance", E. T. Samulski, *Polymer* **26**, 177-189 (1985).
- "Solvent versus Segment Orientation in Strained Swollen Elastomeric Networks", H. Toriumi, B. Deloche, J. Herz and E. T. Samulski, *Macromolecules* **18**, 304-305 (1985).
- "Dimer versus Polymer Liquid Crystals: Alkyl Chain Flexibility via Deuterium NMR", A. C. Griffin and E. T. Samulski, *J. Am. Chem. Soc.* **107**, 2975-2976 (1985).
- "Polymer Diffusion in Molten Poly(propylene oxide)", B. A. Smith, E. T. Samulski, L.-P. Yu and M. A. Winnik, *Macromolecules* **18**, 1901-1905 (1985).

- "Magnetically Oriented Solutions", E. T. Samulski, *Science* **234**, 1424 (1986).
- "Concentration Dependence of the Diffusion of Poly(propylene oxide) in the Melt", B. A. Smith, S. J. Mumby, E. T. Samulski and L.-P. Yu, *Macromolecules* **19**, 470-472 (1986).
- "Three-Dimensional Order in Magnetically Oriented Poly(benzyl-L-glutamate) Films", N. S. Murthy, E. T. Samulski and J. R. Knox, *Macromolecules* **19**, 941-942 (1986).
- "Temperature Dependence of the Diffusion Coefficient of Poly(propylene oxide) in the Undiluted State", S. J. Mumby, B. A. Smith, E. T. Samulski, L.-P. Yu and M. A. Winnik, *Polymer* **27**, 1826-1828 (1986).
- "Deuterium NMR Studies of Polypeptides I. Sidechain Orientation in Poly(benzyl-L-glutamate) and the Mechanism of the Cholesteric Sense Inversion", H. Toriumi, T. Yamazaki, A. Abe and E. T. Samulski, *Liquid Crystals* **1**, 86-95 (1986).
- "Synthesis and Characterization of Liquid Crystalline Alkylisocyanate Copolymers", B. Durairaj, E. T. Samulski and M. T. Shaw, *Polymer Mater. Sci. Eng.* **55**, 840-845 (1986).
- "Poly(benzylglutamate): Order Parameter, Oriented Gel and Novel Derivatives", M. D. Poliks, Y.-W. Park and E. T. Samulski, *Mol. Cryst. & Liq. Cryst.* **155**, 321-346 (1987).
- "D-NMR Study of the Structure and Dynamics of the Side Chains of Several Solid Polyglutamates", E. Meirovitch, E. T. Samulski, A. Leed, H. A. Scheraga, S. Rananavare, G. Nemethy and J. H. Freed, *J. Phys. Chem.* **91**, 4840-4851 (1987).
- "A High Pressure DTA/Dilatometric Apparatus Based on An Instron Capillary Rheometer", B. S. Hsiao, M. T. Shaw and E. T. Samulski, *Rev. Sci. Instr.* **58**, 1009-1013 (1987).
- "Flexible Solutes In a Nematic Solvent", B. Janik, E. T. Samulski and H. Toriumi, *J. Phys. Chem.* **91**, 1842-1850 (1987).
- "Thermotropic Copolyesters III. Synthesis and Characterization of Liquid Crystal Copolyesters Containing the Bicyclo[2.2.2]octane Ring System", M. B. Polk, H. D. Banks, F. Onwumere, N. Venkatasubramanian, M. Nandu, M. Phingbodhipakkiya and E. T. Samulski, *J. Polym. Sci. A* **26**, 2405-22 (1988).
- "The Effects of Temperature and Pressure on the Dynamic Longitudinal Volume Viscosity of Two Model Polymers", B. S. Hsiao, M. T. Shaw and E. T. Samulski, *J. Rheology*, **32**, 533-553 (1988).
- "Pressure-Induced Phases in a Thermotropic Polyester", B. S. Hsiao, M.T. Shaw and E. T. Samulski, *Macromolecules*, **21**, 543-545, (1988).
- "Rubber Elasticity: A Phenomenological Approach Including Orientational Correlations", B. Deloche and E. T. Samulski, *Macromolecules*, **21**, 3107-3111, (1988).
- "Investigation of the Thermal Degradation of Alkyl Isocyanate Polymers by Direct Pyrolysis Mass Spectrometry", B. Durairaj, A. W. Dimock, E. T. Samulski, and M. T. Shaw, *J. Polymer Science*, **27**, 3211-3225 (1989).
- "Study of a Thermotropic Liquid Crystalline Polyester at Elevated Pressures", B. S. Hsiao, M. T. Shaw, and E. T. Samulski, *J. Polym. Sci.*, **28**, 189-202 (1989).
- "Synthesis and Physical Properties of Liquid Crystalline Alkyl Isocyanate Copolymers", B. Durairaj, E. T. Samulski, and M. T. Shaw, *Macromolecules*, **23**, 1229-1234 (1990).
- "NMR Investigation of Chain Deformation in Sheared Polymer Fluids", A. I. Nakatani, M. D. Poliks, and E. T. Samulski, *Macromolecules*, **23**, 2686-2692 (1990).
- "Alkyl Chains in Nematic Field. I. A Treatment of Conformer Shape", D. J. Photinos, E. T. Samulski,

- and H. Toriumi, *J. Phys. Chem.*, **94**, 4689-4694 (1990).
- “Alkyl Chains in a Nematic Field. II. Temperature and Chain Length Dependence in Ordering”, D. J. Photinos, E. T. Samulski, and H. Toriumi, *J. Phys. Chem.*, **94**, 4694-4700 (1990).
- “Molecular Flexibility and Orientational Ordering of Nematic Liquid Crystals”, D. J. Photinos, E. T. Samulski, and H. Toriumi, *J. Chem. Phys.*, **94**, 2758-2772 (1991).
- “Chain Orientation in Deformed Networks via NMR”, C-D. Poon, E. T. Samulski and A. I. Nakatani, *Makromol. Chem. Macromol. Symp.*, **40**, 109-120 (1990).
- “*n*-Hexane Proton Dipolar Couplings and the Rotational Isomeric State Approximation”, D. J. Photinos, B. J. Poliks, A. F. Terzis and H. Toriumi, *Mol. Phys.*, **72**, 333-344 (1991).
- “New Thermotropic Liquid Crystals Derived from Thiophene”, R. Cai and E. T. Samulski, *Liq. Cryst.*, **9**, 617-634 (1991).
- “Deuterium NMR Lineshapes in Polymer Networks”, C-D. Poon and E. T. Samulski, *J. Non-Cryst. Solids*, **131-133**, 509-515 (1991).
- “Molecular ordering in nematics: The modular formulation of the potential of mean torque”, D. J. Photinos, E. T. Samulski, and H. Toriumi, *Mol. Cryst. Liq. Cryst.*, **204**, 161-176 (1991).
- “A Deuterium NMR Study of Benzene Absorbed on Boehmite Glasses”, J. Fukasawa, C-D. Poon and E. T. Samulski, *Langmuir*, **7**, 1727-1733 (1991).
- “Bilayer structures in cholesteric, cyclic-siloxane liquid crystals”, T.J. Bunning, H. E. Klei, E.T. Samulski, R. L. Crane and R. J. Linville, *Liq. Cryst.*, **10**, 445-456 (1991).
- “Liquid Crystalline aromatic polyesters derived from 2,5-thiophene”, R. Cai, J. Preston and E. T. Samulski, *Macromolecules*, **25**, 563- 569 (1992).
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12/299,839		07-0006 United States	Pending	05/29/2009	High Fidelity Nano-Structures and Arrays for Photo...
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11/825,469		04-0104 United States	Pending	07/06/2007	Methods for Fabricating Isolated Micro- and Nano-S...
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