

## **Sindee L. Simon**

Department of Chemical Engineering  
Texas Tech University, Lubbock, TX 79409

### **Education**

B.S. Cum Laude in Chemical Engineering, Yale University, 1983

Ph.D. in Chemical Engineering, Princeton University, 1992

### **Professional Experience**

Sept. 1999 - present	Texas Tech University, Department of Chemical Engineering
Sept. 2012 - present	Whitacre Department Chair
Mar. 2010 - present	P. W. Horn Professor
Sept. 2007 - Aug. 2012	Associate Chair
Sept. 2004 - Mar. 2010	Professor
Sept. 1999 - 2004	Associate Professor
Sept. 2006 to Aug. 2007	Université de Paris Sud, Orsay, France (Developmental Leave) Chercheur, Laboratoire de Chimie Physique
Sept. 1992 to Aug. 1999	University of Pittsburgh, Pittsburgh, PA Assistant Professor, Department of Chemical and Petroleum Engineering
Summers 1997, 1998	AT&T Bell Laboratories Engineering Technical Center, Hopewell, NJ Summer Research Intern
1983 to 1986	Beech Aircraft Corporation, Wichita, KS Materials Engineer for the all-composite Starship

### **Core Strengths and Values**

- Have six years experience as Department Chair and five additional years experience as Associate Department Chair.
- Value and promote student success and am committed to creating a diverse and inclusive environment; I initiated and empower a departmental student advisory council, developed a student mentoring program which includes alumni and peer-to-peer mentoring, and initiated a tutoring program for all students and a stipend for study program for at-risk students.
- Value and promote excellence in the faculty in all aspects of academic life: teaching, research, service, and engagement; I ensure expectations are clear, work towards a common vision, and provide the resources that faculty need to be successful, including faculty mentoring programs, teaching workshops, and venues for recognition.
- Enjoy friend- and fund-raising; obtained a \$ 1 M industrial gift to renovate the TTU ChE teaching laboratories and an additional \$ 1.2 M pilot-scale distillation unit; obtained upper administration approval and support for a major department renovation and expansion.
- Am fiscally responsible with good budget management skills; since becoming chair, I have increased the resources available to the chemical engineering faculty and students and increased faculty productivity while overseeing a near doubling of our undergraduate students and a nearly 50 % increase in graduate student enrollment.
- Am knowledgeable concerning assessment and use benchmarking to help drive change; successfully led the last accreditation cycle for which the department received recognition as an exemplary report showcased at the 2018 ABET Symposium.
- Am committed to safety in both research and teaching laboratories and work closely with the department's safety officer; lead the college in promoting safety through a variety of means.
- Possess a strong record of publication, funding, and recognition for my own scholarship, with 115 publications, an h-index of 31, and several national awards and fellowships.

### **Selected Honors/Awards**

Raiders Who Rock, Teas Tech Faculty Community Service & Leadership Award, 2018.

Fellow, American Institute of Chemical Engineers, 2015.

Outstanding Achievement Award sponsored by Mettler Toledo, North American Thermal Analysis Society (NATAS), 2014 (highest award of the society).

Research/Engineering Technology Award, Society of Plastics Engineers (SPE), 2014.

Special Creativity Award, National Science Foundation Division of Materials Research, 2014.

Scientist of the Year Award, Achievement Rewards for College Scientists (ARCS) Foundation, Lubbock Chapter, awarded with Gregory McKenna, 2013.

Lubbock Woman of Excellence Award, in Science, YWCA, 2013.

Fall Assessment Spotlight Champion, TTU Office of Planning and Assessment, Fall 2012.

Outstanding Service Award, North American Thermal Analysis Society (NATAS), 2012.

Outstanding Professor, Texas Tech AIChE Student Chapter, 2011.

Fellow, American Physical Society (APS), Elected, December 2010.

Horn Professorship, Texas Tech University, 2010.

Barnie E. Rushing, Jr., 2007/08 Faculty Distinguished Research Award, Texas Tech Parents Assoc.

Fellow, Society of Plastics Engineers (SPE), Elected, May 2005.

Fellow, North American Thermal Analysis Society (NATAS), Elected, September 2003.

Outstanding Service Award, Society of Plastics Engineers, Polymer Analysis Division, May 2002.

Most Improved Newsletter, Society of Plastics Engineers, for PAD Review, May 2002.

Best Paper Award, American Society for Composites, Polymer Matrix Division, 2000.

DuPont Instruments Student Scholarship, 1990, administered by the Society of Plastics Engineers.

Nellie P. Elliot Award, Yale University 1983, presented at graduation to one senior woman who best represents the values of Yale University both in the classroom and on the playing field.

Tau Beta Pi National Engineering Honor Society, Yale University.

All American - Swimming, Yale University, 1982.

### **Professional Affiliations**      APS, NATAS, SOR, SPE

### **Summary of Publications and Citations**

(Web of Science, Author Identifier: M-9372-2013; data as of 9/17/18)

- Refereed Journal Articles: 115
- Refereed Book Chapters: 9
- Refereed Proceedings: 37
- Nonrefereed Publications and Conference Proceedings: 58
- 3564 total citations
- Average number of citations per paper: 30.7
- h-index: 31

### **Refereed Journal Publications**

Asterisk indicates corresponding author(s). Number of citations is of 9/17/18.

116. F. Zhang, R. P. Quirk, S. Gerislioglu, C. Wesdemiotis, S. Bekele, M. Tsige, Y. P. Koh, S. L. Simon, and M. D. Foster\*, "Synthesis and Characterization of Well-Defined, Tadpole-Shaped Polystyrene with a Single Atom Junction Point," *Macromolecules*, in press; 10.1021/acs.macromol.8b01384.

115. Y. P. Koh and S. L. Simon\*, "Enthalpy Recovery of Ultrathin Polystyrene Film Using Flash DSC," *Polymer*, 143, 40-45 (2018); DOI: 10.1016/j.polymer.2018.02.038; 1 citation.

114. L. Grassia, \* Y. P. Koh, and S. L. Simon, "Complete Set of Enthalpy Recovery Data Using Flash DSC: Experiment and Modeling," *Macromolecules*, 51 (4), 1549-1558 (2018); DOI: 10.1021/acs.macromol.7b02277; 2 citations.

113. M. Pallaka, D. Unruh, and S. L. Simon\*, "Melting Behavior of n-Alkanes in Anodic Aluminum Oxide (AAO) Nanopores using Flash Differential Scanning Calorimetry," *Thermochemica Acta*, 663, 157-164 (2018); DOI: 10.1016/j.tca.2018.01.016.
112. R. Bari and S. L. Simon\*, "Determination of the Nonlinearity and Activation Energy Parameters in the TNM Model of Structural Recovery," *Journal of Thermal Analysis and Calorimetry*, published on line April 2017; 131(1), 317-324 (2018); DOI: 10.1007/s10973-017-6381-6; 2 citations.
111. S. L. Simon\* and G. B. McKenna\*, "50th Anniversary Perspective: Challenges in the Dynamics and Kinetics of Glass-Forming Polymers," *Macromolecules*, 50, 6333-6361 (2017); DOI: 10.1021/acs.macromol.7b01014; 12 citations.
110. R. Tao, E. Gurung, M. M. Cetin, M. F. Mayer, E. L. Quitevis, S. L. Simon\*, "Fragility of Ionic Liquids Measured by Flash Differential Scanning Calorimetry," *Thermochimica Acta*, 654 (10), 121-129 (2017); DOI: 10.1016/j.tca.2017.05.008; 2 citations.
109. H. D. Yoon, Y. P. Koh, S. L. Simon, G. B. McKenna\*, "An Ultrastable Polymeric Glass: Amorphous Fluoropolymer with Extreme Fictive Temperature Reduction by Vacuum Pyrolysis," *Macromolecules*, 50 (11), 4562-4574 (2017); DOI: 10.1021/acs.macromol.7b00623; 3 citations.
108. Y. P. Koh and S. L. Simon\*, "The Glass Transition and Enthalpy Recovery of a Single Polystyrene Ultrathin Film using Flash DSC," *Journal of Chemical Physics*, 146 (20), 203329/1-6 (2017); DOI: 10.1063/1.4979126; 3 citations.
107. Y. P. Koh, S. Gao, and S. L. Simon\*, "Structural Recovery of a Single Polystyrene Thin Film using Flash DSC at Low Aging Temperatures," *Polymer*, 96, 182-187 (2016); DOI: 10.1016/j.polymer.2016.04.047; 18 citations.
106. E. Lopez and S. L. Simon\*, "Signatures of Structural Recovery in Polystyrene by Nanocalorimetry," *Macromolecules*, 49, 2365-2374 (2016); DOI: 10.1021/acs.macromol.5b02112; 13 citations.
105. L. J. Xue, E. Gurung, G. Tamas, Y. P. Koh, M. Shadeck, S. L. Simon\*, M. Maroncelli\*, and E. L. Quitevis\*, "Effect of Alkyl Chain Branching on Physicochemical Properties of Imidazolium-Based Ionic Liquids," *J. Chemical and Engineering Data*, 61 (3), 1078-1091 (2016); DOI: 10.1021/acs.jced.5b00658; 20 citations.
104. N. Shamim, Y. P. Koh, S. L. Simon, G. B. McKenna\*, "The Glass Transition of Trinitrotoluene (TNT) by Flash DSC," *Thermochimica Acta*, 620, 36-39 (2015); DOI: 10.1016/j.tca.2015.10.003; 4 citations.
103. R. Tao and S. L. Simon\*, "Rheology of Imidazolium-Based Ionic Liquids with Aromatic Functionality," *J. Phys. Chem. B*, 119, 11953-11959 (2015); DOI: 10.1021/acs.jpcc.5b06163; 13 citations.
102. R. Tao and S. L. Simon\*, "Pressure-Volume-Temperature and Glass Transition Behavior of Silica/Polystyrene Nanocomposite," *Journal of Polymer Science Part B: Polymer Physics*, 53, 1131 - 1138 (2015); DOI: 10.1002/polb.23749; 8 citations.
101. E. Lopez and S. L. Simon\*, "Trimerization Reaction Kinetics and  $T_g$  Depression of Polycyanurate under Nanoconfinement," *Macromolecules*, 48 (13), 4692 - 4701 (2015); DOI: 10.1021/acs.macromol.5b00167; 14 citations.
100. H. Y. Zhao and S. L. Simon\*, "Equilibrium Free-Radical Polymerization of Methyl Methacrylate under Nanoconfinement," *Polymer*, 6 (1), 173 - 178 (2015); DOI: 10.1016/j.polymer.2015.04.017; 2 citations.

99. R. Tao and S. L. Simon\*, "Bulk and Shear Rheology of Silica/Polystyrene Nanocomposite: Reinforcement and Dynamics," *Journal of Polymer Science Part B: Polymer Physics*, 53 (9), 621 - 632 (2015); DOI: 10.1002/polb.23669; 9 citations.
98. Y. P. Koh, L. Grassia, and S. L. Simon\*, "Structural Recovery of a Single Polystyrene Thin Film Using Nanocalorimetry to Extend the Aging Time and Temperature Range," *Thermochimica Acta*, 603, 135 - 141 (2015); DOI: 10.1016/j.tca.2014.08.025; 29 citations.
97. S. Y. Gao and S. L. Simon\*, "Measurement of the Limiting Fictive Temperature over Five Decades of Cooling and Heating Rates," *Thermochimica Acta*, 603, 123 - 127 (2015); DOI: 10.1016/j.tca.2014.08.019; 14 citations.
96. N. Shamim, Y. P. Koh, S. L. Simon\* and G. B. McKenna\*, "The Glass Transition Temperature of Thin Polycarbonate Films Measured by Flash Differential Scanning Calorimetry," *Journal of Polymer Science: Part B: Polymer Physics*, 52, 1462 -1468 (2014); DOI: 10.1002/polb.23583; 22 citations.
95. H. Y. Zhao, Z. N. Yu, F. Begum, R. C. Hedden, and S. L. Simon\*, "The Effect of Nanoconfinement on Methyl Methacrylate Polymerization:  $T_g$ , Molecular Weight, and Tacticity," *Polymer* 55, 4959 - 4965 (2014); DOI: 10.1016/j.polymer.2014.07.040; 8 citations.
94. R. Tao, G. Tamas, L. J. Xue, S. L. Simon\*, and E. L. Quitevis\*, "Thermophysical Properties of Imidazolium-Based Ionic Liquids: The Effect of Aliphatic versus Aromatic Functionality," *Journal of Chemical and Engineering Data*, 59, 2717 - 2724 (2014); DOI: 10.1021/je500185r; 28 citations.
93. S. Y. Gao and S. L. Simon\*, "The Reaction Kinetics of Cyclopentadiene Dimerization using Differential Scanning Calorimeter: Experiments and Modeling," *Thermochimica Acta* 589, 241 - 246 (2014); DOI: 10.1016/j.tca.2014.05.031; 1 citation.
92. Y. P. Koh and S. L. Simon\*, "Enthalpy Recovery of Polystyrene: Does a Long-Term Aging Plateau Exist?" *Macromolecules*, 46 (14), 5815 - 5821 (2013); DOI: 10.1021/ma4011236; 35 citations.
91. H. Y. Zhao, Y. P. Koh, M. Pyda, S. Sen, S. L. Simon\*, "The Kinetics of the Glass Transition and Physical Aging in Germanium Selenide Glasses," *Journal of Non-Crystalline Solids*, 368, 63 - 70 (2013); DOI: 10.1016/j.jnoncrysol.2013.02.025; 19 citations.
90. F. Begum, R. H. Sarker, S. L. Simon\*, "Modeling Ring-Chain Equilibrium in Nanoconfined Sulfur," *Journal of Physical Chemistry B*, 117, 3911 - 3916 (2013); DOI: 10.1021/jp400145n; 6 citations.
89. J. Zhao, S. L. Simon, G. B. McKenna\*, "Using 20 Million Year Old Amber to Test the Super-Arrhenius Behavior of Glass Forming Systems," *Nature Communications*, 4:1783/1-4 (2013); DOI: 10.1038/ncomms2809; 90 citations.
88. S. Y. Gao, Y. P. Koh, S. L. Simon\*, "The Calorimetric Glass Transition of Single Polystyrene Ultrathin Films," *Macromolecules*, 46, 562 - 570 (2013); DOI: 10.1021/ma3020036; 77 citations.
87. Y. P. Koh, M. N. Karim, S. L. Simon\*, "Heterogeneous Reaction Kinetics of Epoxide-Functionalized Regenerated Cellulose Membrane and Aliphatic Amine," *Thermochimica Acta*, 543, 18 - 23 (2012); DOI: 10.1016/j.tca.2012.04.031.
86. J. X. Guo, L. Grassia, and S. L. Simon\*, "Bulk and Shear Rheology of a Symmetric Three-Arm Star Polystyrene," *Journal of Polymer Science: Part B: Polymer Physics*, 50 (17), 1233-1244, 2012; DOI: 10.1002/polb.23113; 22 citations.
85. L. Grassia\* and S. L. Simon, "Modeling Volume Relaxation of Amorphous Polymers: Modification of the Equation for the Relaxation Time in the KAHR Model," *Polymer*, 53

- (16), 3613 - 3620 (2012); DOI: 10.1016/j.polymer.2012.06.013; 28 citations.
84. F. Begum, H. Y. Zhao, and S. L. Simon, "Modeling Methyl Methacrylate Free Radical Polymerization: Reaction in Hydrophobic Nanopores," *Polymer*, 53 (15), 3261 - 3268 (2012); DOI: 10.1016/j.polymer.2012.04.036; 17 citations.
  83. F. Begum, H. Y. Zhao, and S. L. Simon, "Modeling Methyl Methacrylate Free Radical Polymerization: Reaction in Hydrophilic Nanopores," *Polymer*, 53 (15), 3238 - 3244 (2012); DOI: 10.1016/j.polymer.2012.05.023; 15 citations.
  82. Y. P. Koh and S. L. Simon\*, "Crystallization and Vitrification of a Cyanurate Trimer in Nanopores," *Journal of Physical Chemistry B*, 116 (26), 7754 - 7761 (2012); DOI: 10.1021/jp303318e; 12 citations
  81. J. X. Guo and S. L. Simon\*, "Thermodynamic Scaling of Polymer Dynamics versus  $T - T_g$  Scaling," *Journal of Chemical Physics*, 135, 074901 (2011); DOI: 10.1063/1.3624903; 14 citations.
  80. H. Y. Zhao and S. L. Simon\*, "Methyl Methacrylate Polymerization in Nanoporous Confinement," *Polymer*, 52 4093 - 4098 (2011); DOI: 10.1016/j.polymer.2011.06.048; 26 citations.
  79. W. Zheng, A. Mohammed, L. G. Hines Jr., D. Xiao, O. J. Martinez, R. A. Bartsch, S. L. Simon, O. Russina, A. Triolo\*, and E. L. Quitevis\*, "Effect of Cation Symmetry on the Morphology and Physicochemical Properties of Imidazolium Ionic Liquids," *Journal of Physical Chemistry B*, 115 (20), 6572 - 6584 (2011); DOI: 10.1021/jp1115614; 107 citations.
  78. F. Begum and S. L. Simon\*, "Modeling Methyl Methacrylate Free Radical Polymerization in Nanoporous Confinement," *Polymer*, 52, 1539 - 1545 (2011); DOI: 10.1016/j.polymer.2011.02.009; 20 citations.
  77. Y. P. Koh and S. L. Simon\*, "Kinetic Study of Trimerization of Monocyanate Ester in Nanopores," *Journal of Physical Chemistry B*, 115 (5), 925 - 932 (2011); DOI: 10.1021/jp110192g; 9 citations.
  76. J. X. Guo and S. L. Simon\*, "Pressure-Volume-Temperature Behavior of Two Polycyanurate Networks," *Journal of Polymer Science: Part B: Polymer Physics*, 48 (23) 2509 - 2517 (2010); DOI: 10.1002/polb.22155; 8 citations.
  75. W. Zheng, G. B. McKenna, and S. L. Simon\*, "The Viscoelastic Behavior of Polymer/Oligomer Blends," *Polymer*, 51 (21), 4899 - 4906 (2010); DOI: 10.1016/j.polymer.2010.08.046; 10 citations.
  74. L. Grassia\*, A. D'Amore, S. L. Simon, "On the Viscoelastic Poisson's Ratio in Amorphous Polymers," *Journal of Rheology*, 54 (5), 1009 - 1022 (2010); DOI: 10.1122/1.3473811; 26 citations.
  73. Y. P. Koh and S. L. Simon\*, "Trimerization of Monocyanate Ester in Nanopores," *Journal of Physical Chemistry B*, 114 (23), 7727 - 7734 (2010); DOI: 10.1021/jp912235c; 27 citations.
  72. K. Z. Win, T. Karim, Q. X. Li, S. L. Simon, and G. B. McKenna\*, "Thermal Pressure Coefficient of a Polyhedral Oligomeric Silsesquioxane (POSS)-Reinforced Epoxy Resin," *Journal of Applied Polymer Science*, 116 (1), 142 - 146 (2010); DOI: 10.1002/app.31502; 6 citations.
  71. J. X. Guo and S. L. Simon\*, "Effect of Crosslink Density on the Pressure Relaxation Response of Polycyanurate Networks," *Journal of Polymer Science: Part B: Polymer Physics*, 47, 2477 - 2486 (2009); 12 citations.
  70. C. Dalle-Ferrier, S. Simon, W. Zheng, P. Badrinarayanan, T. Fennell, B. Frick, J. M. Zanotti, and C. Alba-Simionesco\*, "The Consequence of Excess Configurational Entropy

- on Fragility: The Case of a Polymer/Oligomer Blend," *Physical Review Letters*, 103, 185702 (2009); 18 citations.
69. Y. P. Koh, Q. X. Li, and S. L. Simon\*, "T<sub>g</sub> and Reactivity at the Nanoscale," *Thermochimica Acta*, 492 (1-2), 45 - 50 (2009); 22 citations.
  68. Q. X. Li and S. L. Simon\*, "Surface Chemistry Effects on the Reactivity and Properties of Nanoconfined Bisphenol M Dicyanate Ester/Polycyanurate in Controlled Pore Glass," *Macromolecules*, 42 (10), 3573 - 3579 (2009); 38 citations.
  67. S. L. Simon\* and G. B. McKenna, "Experimental Evidence Against the Existence of an Ideal Glass Transition," *Journal of Non-Crystalline Solids*, 355, 672 - 675 (2009); 16 citations.
  66. Y. Meng, P. Bernazzani, P. A. O'Connell, G. B. McKenna, and S. L. Simon\*, "A New Pressurizable Dilatometer for Measuring the Time-Dependent Bulk Modulus and Pressure-Volume-Temperature Properties of Polymeric Materials," *Review of Scientific Instruments*, 80, 053903 (2009); 11 citations.
  65. Q. X. Li, S. A. Hutcheson, G. B. McKenna, S. L. Simon\*, "Viscoelastic Properties and Residual Stresses in Polyhedral Oligomeric Silsesquioxane (POSS)-Reinforced Epoxy Matrices," *Journal of Polymer Science: Part B: Polymer Physics*, 46 (24), 2719 - 2732 (2008); 20 citations.
  64. Y. P. Koh and S. L. Simon\*, "Structural Relaxation of Stacked Ultrathin Polystyrene Films," *Journal of Polymer Science: Part B: Polymer Physics*, 46 (24), 2741 - 2753 (2008); 86 citations.
  63. P. Badrinarayanan, S. L. Simon\*, R. J. Lyng, and J. M. O'Reilly\*, "Effect of Structure on Enthalpy Relaxation of Polycarbonate: Experiments and Modeling," *Polymer*, 49, 3554 - 3560 (2008); DOI: 10.1016/j.polymer.2008.05.046; 25 citations.
  62. Q. X. Li and S. L. Simon\*, "Curing of Bisphenol M Dicyanate Ester under Nanoscale Constraint," *Macromolecules*, 41 (4), 1310 - 1317 (2008); 39 citations.
  61. W. Zheng and S. L. Simon\*, "The Glass Transition in Athermal Poly( $\alpha$ -methyl styrene)/Oligomer Blends," *Journal of Polymer Science: Part B: Polymer Physics*, 46 (4), 418 - 430 (2008); 25 citations.
  60. P. Badrinarayanan, W. Zheng, and S. L. Simon\*, "Isoconversional Analysis of the Glass Transition," *Thermochimica Acta*, 468 (1-2) 87 - 93 (2008); 12 citations.
  59. Y. Meng and S. L. Simon\*, "Pressure Relaxation of Polystyrene and Its Comparison to the Shear Response," *Journal of Polymer Science: Part B: Polymer Physics*, 45 (21) 3375 - 3385 (2007); 19 citations.
  58. W. Zheng and S. L. Simon\*, "Confinement Effects on the Glass Transition of Hydrogen Bonded Liquids," *Journal of Chemical Physics*, 127 (19), 194501 (2007); 37 citations.
  57. J. Sun and S. L. Simon\*, "The Melting Behavior of Aluminum Nanoparticles," *Thermochimica Acta*, 463 (1-2), 32 - 40 (2007); 204 citations.
  56. P. Badrinarayanan, W. Zheng, Q. X. Li, and S. L. Simon\*, "The Glass Transition Temperature versus the Fictive Temperature," *Journal of Non-Crystalline Solids*, 353, 2603 - 2612 (2007); DOI: 10.1016/j.jnoncrysol.2007.04.025; 125 citations.
  55. R. Pitchimani, W. Zheng, S. L. Simon, L. Hope-Weeks, A. K. Burhnam, and B. L. Weeks\*, "Thermodynamic Analysis of Pure and Impurity Doped Pentaerythritol Tetranitrate Crystals Grown at Room Temperature," *Journal of Thermal Analysis and Calorimetry*, 89 (2), 475 - 778 (2007); 10 citations.
  54. Z. Z. Li, Q. X. Li, S. Simon, N. Guven, K. Borges, B. B. C. Youan\*, "Formulation of Spray-Dried Phenytoin Loaded Poly( $\epsilon$ -caprolactone) Microcarrier Intended for Brain Delivery To Treat Epilepsy," *Journal of Pharmaceutical Sciences*, 96 (5), 1018 - 1030 (2007); 18 citations.
  53. Q. X. Li and S. L. Simon\*, "Viscoelastic Shear Response and Network Structure in Polycyanurates," *Macromolecules*, 40 (6), 2246 - 2256 (2007); DOI: 10.1021/ma0624144; 17 citations.

52. P. Badrinarayanan and S. L. Simon\*, "Origin of the Divergence of the Timescales for Volume and Enthalpy Recovery," *Polymer*, 48, 1464 - 1470 (2007); DOI: 10.1016/j.polymer.2007.01.064; 31 citations.
51. Y. P. Koh, G. B. McKenna, and S. L. Simon\*, "Calorimetric Glass Transition Temperature and Absolute Heat Capacity of Polystyrene Ultrathin Films," *Journal of Polymer Science: Part B: Polymer Physics*, 44 (24), 3518 - 3527 (2006); 76 citations.
50. S. L. Simon\* and P. Bernazzani, "Structural Relaxation in the Glass: Evidence for a Path Dependence of the Relaxation Time," *Journal of Non-Crystalline Solids*, 352 (42-49), 4763 - 4768 (2006); DOI: 10.1016/j.jnoncrysol.2006.01.151; 28 citations.
49. T. Rajagopalan, B. Lahlouh, J.A. Lubguban, N. Biswas, S. Gangopadhyay\*, J. Sun, D. H. Huang, S. L. Simon, D. Toma and R. Butler, "Investigation on Hexamethyldisilazane Vapor Treatment of Plasma-Damaged Nanoporous Organosilicate Films," *Applied Surface Science*, 252 (18), 6323 - 6331 (2006); 20 citations.
48. Q. X. Li and S. L. Simon\*, "Enthalpy Recovery of Polymeric Glasses: Is the Theoretical Limiting Liquid Line Reached?" *Polymer*, 47 (13), 4781 - 4788 (2006); 30 citations.
47. J. Sun, M. L. Pantoya, and S. L. Simon\*, "Dependence of Size and Size Distribution on Reactivity of Aluminum Nanoparticles in Reactions with Oxygen and MoO<sub>3</sub>," *Thermochimica Acta*, 444 (2), 117-127 (2006); 103 citations.
46. W. Zheng and S. L. Simon\*, "Polystyrene Freeze Dried from Dilute Solution: T<sub>g</sub> Depression and Residual Solvent Effects," *Polymer*, 47 (10), 3520 - 3527 (2006); 15 citations.
45. B. Lahlouh, T. Rajagopalan, N. Biswas, J. Sun, D. Huang, S. L. Simon, J. A. Lubguban and S. Gangopadhyay\*, "Post Treatments of Plasma-Enhanced Chemical Vapor Deposited Hydrogenated Amorphous Silicon Carbide for Low Dielectric Constant Films," *Thin Solid Films*, 497 (1-2), 109 - 114 (2006); 7 citations.
44. M. Merzlyakov, G. B. McKenna, and S. L. Simon\*, "Cure-Induced and Thermal Stresses in a Constrained Epoxy Resin," *Composites Part A: Applied Science and Manufacturing*, 37 (4), 585 - 591 (2006); 26 citations.
43. Y. Meng and S. L. Simon\*, "Relation between Mobility Factor and Diffusion Factor for Thermoset Cure," *Thermochimica Acta*, 437 (1-2), 179 - 189 (2005); 8 citations.
42. M. Merzlyakov, S. L. Simon, and G. B. McKenna\*, "Instrumented Thick-Walled Tube Method for Measuring Thermal Pressure in Fluids and Isotropic Stresses in Thermosetting Resins," *Review of Scientific Instruments*, 76 (6), 063904-1 - 063904-7 (2005); 2 citations.
41. P. Doshi and S. Simon\*, "Modeling Nanoporosity Development in Polymeric Films for Low-k Applications," *Polymer Engineering and Science*, 45 (5), 640 - 651 (2005); 3 citations.
40. D. H. Huang, S. L. Simon, G. B. McKenna\*, "Chain Length Dependence of the Thermodynamic Properties of Linear and Cyclic Alkanes and Polymers," *Journal of Chemical Physics*, 122 (8), 084907-1 - 084907-6 (2005); 38 citations.
39. S. Kolla and S. L. Simon\*, "The  $\tau$ -Effective Paradox: New Measurements Towards a Resolution," *Polymer*, 46 (3), 733 - 739 (2005); 16 citations.
38. J. Lubguban, S. Gangopadhyay\*, B. Lahlouh, T. Rajagopalan, J. Sun, D. Huang, S. L. Simon, A. Mallikarjunan, H. Kim, J. Hedstrom, W. Volksen, R. Miller, and M. Toney, "Supercritical CO<sub>2</sub> Extraction of Porogen Phase: An Alternative Route to Nanoporous Dielectrics," *Journal of Materials Research*, 19 (11), 3224 - 3233 (2004); 11 citations.
37. M. Merzlyakov, Y. Meng, S. L. Simon and G. B. McKenna\*, "Instrumented Sphere Method for Measuring Thermal Pressure in Fluids and Isotropic Stresses and Reaction Kinetics in Thermosetting Resins," *Review of Scientific Instruments*, 75 (10), 3327 - 3334 (2004); 7 citations.
36. S. L. Simon\*, P. Bernazzani, and G. B. McKenna, "Effects of Freeze-Drying on the Glass Temperature of Cyclic Polystyrenes," *Polymer*, 44 (26), 8025 - 8032 (2003); 20 citations.
35. I. Echeverria, P. L. Kolek, D. J. Plazek, and S. L. Simon\*, "Enthalpy Recovery, Creep and Creep-Recovery Measurements during Physical Aging of Amorphous Selenium," *Journal of Non-Crystalline Solids*, 324 (3), 242 - 255 (2003); 62 citations.

34. D. H. Huang, S. L. Simon and G. B. McKenna\*, "Equilibrium Heat Capacity of the Glass-Forming Poly( $\alpha$ -methyl styrene) Far Below the Kauzmann Temperature: The Case of the Missing Glass Transition," *Journal of Chemical Physics*, 119 (7), 3590 - 3593 (2003); 28 citations.
33. T. Rajagopalan, B. Lahlouh, J. A. Lubguban, N. Biswas, S. Gangopadhyay\*, J. Sun, D. H. Huang, S. L. Simon, A. Malikarjun, H. C. Kim, W. Volksen, M. F. Toney, E. Huang, P. M. Rice, E. Delenia, and R. D. Miller, "Supercritical Carbon Dioxide Extraction of Porogens for the Preparation of Ultralow-Dielectric-Constant Films," *Applied Physics Letters*, 82 (24), 4328 - 4330 (2003); 23 citations.
32. M. Alcoutlabi, G. B. McKenna, and S. L. Simon\*, "Analysis of the Development of Isotropic Residual Stresses in a Bismaleimide/Spiro Orthocarbonate Thermosetting Resin for Composite Materials," *Journal of Applied Polymer Science*, 88 (1), 227 - 244 (2003); 27 citations.
31. J. A. Lubguban, J. Sun, T. Rajagopalan, B. Lahlouh, S. L. Simon and S. Gangopadhyay\*, "Supercritical Carbon Dioxide Extraction to Produce Low- $k$  Plasma Enhanced Chemical Vapor Deposition Dielectric Films," *Applied Physics Letters*, 81 (23), 4407 - 4409 (2002); 11 citations.
30. Y. Zheng, S. L. Simon and G. B. McKenna\*, "Modeling Structural Recovery in Glasses: Analysis of the Peak Shift Method," *Journal of Polymer Science: Part B: Polymer Physics*, 40 (18), 2027 - 2036 (2002); 10 citations.
29. P. Bernazzani and S. L. Simon\*, "Volume Recovery of Polystyrene: Evolution of the Characteristic Relaxation Time," *Journal of Non-Crystalline Solids*, 307-310C, 470 - 480 (2002); 19 citations.
28. K. M. Bernatz, I. Echeverria, S. L. Simon\* and D. J. Plazek\*, "Characterization of the Molecular Structure of Amorphous Selenium using Recoverable Creep Compliance Measurements," *Journal of Non-Crystalline Solids*, 307, 790 - 801 (2002); 34 citations.
27. J. Lubguban, T. Rajagopalan, N. Mehta, B. Lahlouh, S. L. Simon and S. Gangopadhyay\*, "Low- $k$  Organosilicate Films Prepared by Tetravinyltetramethylcyclotetrasiloxane," *Journal of Applied Physics*, 92 (2), 1033 - 1038 (2002); 56 citations.
26. P. Bernazzani, S. L. Simon\*, D. J. Plazek and K. L. Ngai, "Effects of Entanglement Concentration on  $T_g$  and Local Segmental Motions," *European Physical Journal E: Soft Matter*, 8 (2), 201 - 207 (2002); 46 citations.
25. S. L. Simon\*, J.-Y. Park and G. B. McKenna\*, "Enthalpy Recovery of a Glass-Forming Liquid Constrained in a Nanoporous Matrix: Negative Pressure Effects," *European Physical Journal E: Soft Matter*, 8 (2), 209 - 216 (2002); 81 citations.
24. K. M. Bernatz, I. Echeverria, S. L. Simon\*, and D. J. Plazek\*, "Viscoelastic Properties of Amorphous Boron Trioxide," *Journal of Non-Crystalline Solids*, 289, 9 - 16 (2001); 9 citations.
23. S. L. Simon\*, "Temperature Modulated DSC: Theory and Application," *Thermochimica Acta*, 374 (1), 55 - 71 (2001); Review solicited by Associate Editor; 88 citations.
22. S. L. Simon\*, J. W. Sobieski, and D. J. Plazek, "Volume and Enthalpy Recovery of a Polystyrene," *Polymer*, 42 (6), 2555 - 2567 (2001); 172 citations.
21. P. Prasatya, G. B. McKenna, and S. L. Simon\*, "A Viscoelastic Model For Predicting Hydrostatic Residual Stresses in Thermosetting Materials: Effects of Processing Parameters," *Journal of Composite Materials*, 35 (10), 826 - 848 (2001); 73 citations.
20. S. L. Simon\* and G. B. McKenna, "Quantitative Analysis of the Errors in TMDSC in the Glass Transition Region," *Thermochimica Acta*, 348 (1-2), 77 - 89 (2000); 21 citations.
19. S. L. Simon\*, G. B. McKenna, and O. Sindt, "Modeling the Evolution of the Dynamic Mechanical Properties of a Commercial Epoxy during Cure after Gelation," *Journal of Applied Polymer Science*, 76 (4), 495 - 508 (2000); 118 citations.
18. K. M. Bernatz, L. Giri, S. L. Simon\*, and D. J. Plazek\*, "Physical Aging by Periodic and Interrupted Creep Experiments," *Journal of Chemical Physics*, 111(5), 2235 - 2241 (1999); 6 citations.

17. E. Karmana, S. Simon\* and R. Enick, "Carbon-Dioxide-Based Microsortation of Postconsumer Polyolefins and its Effect on Polyolefin Properties," *Polymer-Plastics Technology and Engineering*, 38 (3), 433 - 444 (1999).
16. S. L. Simon\* and G. B. McKenna, "Measurement of Thermal Conductivity Using TMDSC: Solution to the Heat Flow Problem," *Journal of Reinforced Plastics and Composites*, 18 (6), 559 - 571 (1999); 12 citations.
15. R. E. Zacharia, S. L. Simon\*, E. J. Beckman, and R. M. Enick, "Improving the Thermal Stability of a Polymer through Liquid Carbon Dioxide Extraction of a Transition Metal Catalyst," *Journal of Polymer Degradation and Stability*, 63 (1), 85 - 88 (1999); 8 citations.
14. R. E. Zacharia and S. L. Simon\*, "Dynamic and Isothermal Thermogravimetric Analysis of a Polycyanurate Thermosetting System," *Polymer Engineering and Science*, 38 (4), 566 - 572 (1998); 7 citations.
13. S. L. Simon\* and G. B. McKenna, "The Effects of Structural Recovery and Thermal Lag in Modulated DSC Measurements," *Thermochemica Acta*, 307 (1), 1 - 10 (1997); 32 citations.
12. S. L. Simon\* and G. B. McKenna\*, "Interpretation of Dynamic Heat Capacity in Glass-Forming Liquids," *Journal of Chemical Physics*, 107 (20), 8678 - 8685 (1997); 43 citations.
11. S. L. Simon\*, "Enthalpy Recovery of Polyetherimide: Experiment and Model Calculations Incorporating Thermal Lag Effects," *Macromolecules*, 30 (14), 4056 - 4063 (1997); 54 citations.
10. S. L. Simon\*, D. J. Plazek, J. W. Sobieski, and E. T. McGregor, "Physical Aging of a Polyetherimide: Volume Recovery and Its Comparison to Creep and Enthalpy Measurements," *Journal of Polymer Science: Part B: Polymer Physics*, 35 (6), 929 - 936 (1997); 96 citations.
9. R. E. Zacharia and S. L. Simon\*, "Effect of Catalyst on the Thermal Degradation of a Polycyanurate Thermosetting System," *Journal of Applied Polymer Science*, 64 (1), 127 - 131 (1997); 14 citations.
8. R. E. Zacharia and S. L. Simon\*, "Thermogravimetric Analysis of a Polycyanurate Thermosetting Material," *Journal of Thermal Analysis*, 49 (1), 311 - 315 (1997); 2 citations.
7. W. J. Sobieski, S. L. Simon\*, and D. J. Plazek, "Dilatometric Studies of Physical Aging of Polyetherimide," *Journal of Thermal Analysis*, 49 (1), 455 - 460 (1997).
6. I. Echeverria\*, P-C. Su, S. L. Simon, D. J. Plazek, "Physical Aging of Polyetherimide: Creep and DSC Measurements," *Journal of Polymer Science: Part B: Polymer Physics*, 33 (17), 2457 - 2468 (1995); 58 citations.
5. S. L. Simon and J. K. Gillham\*, "Thermosetting Cure Diagrams: Calculation and Application," *Journal of Applied Polymer Science*, 53 (6), 709 - 727 (1994); 43 citations.
4. S. L. Simon and J. K. Gillham\*, "Conversion-Temperature-Property Diagram for a Liquid Dicyanate Ester/High-Tg Polycyanurate Thermosetting System," *Journal of Applied Polymer Science*, 51 (10), 1741 - 1752 (1994); 27 citations.
3. S. L. Simon and J. K. Gillham\*, "Coating Applications of Thermosetting Cure Diagrams: Off-Stoichiometric High-Tg Epoxy/Amine Systems," *Journal of Coatings Technology*, 65 (823), 57 - 65 (1993); 1 citation.
2. S. L. Simon and J. K. Gillham\*, "Cure Kinetics of a Liquid Dicyanate Ester Monomer/High-Tg Polycyanurate Material," *Journal of Applied Polymer Science*, 47 (3), 461 - 485 (1993); 180 citations.
1. S. L. Simon and J. K. Gillham\*, "Reaction Kinetics and TTT Cure Diagrams for Off-Stoichiometric Ratios of a High-Tg Epoxy/Amine System," *Journal of Applied Polymer Science*, 46 (7), 1245 - 1270 (1992); 90 citations.

## **Refereed Book Chapters**

9. S. L. Simon and G. B. McKenna, "Structural Recovery and Physical Aging of Polymeric Glasses," Ch. 2, pp. 23 - 54, in "Polymer Glasses," C. B. Roth, Ed., Taylor & Francis, 2017.
8. Yung P. Koh and S. L. Simon, "The Glass Transition and Structural Recovery Using Flash DSC," Ch. 14, pp. 433 - 459, in "Fast Scanning Calorimetry," V. Mathot and C. Schick, Eds., to be published by Springer International Publishing AG, 2016.
7. S. L. Simon, "Dynamics of Confined Glass-Forming Liquids near Equilibrium Conditions," Ch. 11, pp. 245 - 263, in "Non-equilibrium Phenomena in Confined Soft Matter," S. Napolitano, Ed., Springer International Publishing AG, 2015.
6. S. L. Simon, "Physical Aging," in "Encyclopedia of Polymer Science and Technology," Jacqueline Kroschwitz, Ed., John Wiley & Sons, 2003.
5. G. B. McKenna and S. L. Simon, "The Glass Transition: Its Measurement and Underlying Physics," in "Handbook of Thermal Analysis and Calorimetry," Volume 3, S. Z. D. Cheng, Ed., pp. 49 - 109, Elsevier, Amsterdam, 2002.
4. G. B. McKenna and S. L. Simon, "Time Dependent Volume and Enthalpy Responses in Polymers," in Time Dependent and Nonlinear Effects in Polymers and Composites, ed. by R.A. Schapery and C. T. Sun, pp. 18 - 46, American Society of Testing and Materials, Special Technical Publication, STP 1357, 2000.
3. S. L. Simon, "Fitting DSC Heating Curves with the Tool-Narayanaswamy-Moynihan Model of Structural Recovery," Chapter 13 in "Structure and Properties of Glassy Polymers," M. R. Tant and A. J. Hill, Eds, ACS Symposium Series No. 710, Oxford University Press, UK, 1998.
2. I. Echeverria and S. L. Simon, "Structural Relaxation of Poly(Ether Imide): A Comparison of the Times to Reach Equilibrium for Different Properties" in "Recent Research Developments in Polymer Science," Volume 2, A. B. Salamone, J. Brandrup, R. M. Ottenbrite, and D.G. Pandalai, Eds., Transworld Research Network, Trivandrum, India, 1998.
1. S. L. Simon and J. K. Gillham, "Cyanate Ester/Polycyanurate Systems: Structure-Property Relationships" in "Chemistry and Technology of Cyanate Ester Resin," I. Hamerton, Ed., Blackie Academic & Professional, Glasgow, UK, 1994.

## **Recent Invited Lectures (out of 114 total)**

- "Polymerization Kinetics, Thermodynamics, and Synthesis under Nanoconfinement," Sichuan University, Chengdu, China, December 2018 (invitation accepted).
- "Polymerization Synthesis under Nanoconfinement," Third International Conference on Polymer Science and Engineering (PSE 2018), Beijing, China, December 2018 (invitation accepted).
- " $T_g$  and Structural Recovery at the Nanoscale using Flash Calorimetry," Beijing University of Chemical Technology, Beijing, China, December 2018 (invitation accepted).
- "Polymerization Kinetics and Thermodynamics under Nanoconfinement," 7th Texas Soft Matter Meeting, University of Texas at Austin, August 17, 2018.
- " $T_g$  and Structural Recovery of Nanoconfined Polystyrene," NIST Twentieth Symposium on Thermophysical Properties, Boulder, CO, June 2018.
- " $T_g$  and Physical Aging of Bulk and Nanoconfined Polystyrene," 9<sup>th</sup> International Conference on Times of Polymers and Composites (TOP), Ischia, Italy, June 2018.
- " $T_g$  at the Nanoscale with Flash DSC," Annual Meeting of the North American Thermal Analysis Society, Newark, DE, August 2017.
- " $T_g$  and Entropy Changes on Nanoconfinement of Chains," 8th International Discussion Meeting on Relaxations in Complex Systems, Wisla, Poland, July 2017.
- "Polymerization Kinetics and Thermodynamics under Nanoconfinement," Session Honoring Bob Weiss, Society of Plastics Engineers Annual Technical Meeting (ANTEC), Anaheim, CA, May 2017.
- "Polymer and Glass Chemistry and Physics at the Nanoscale," Department of Chemical & Biological Engineering, University of New Mexico, Albuquerque, NM, April 2017.
- " $T_g$  and Structural Recovery at the Nanoscale," March Meeting of the American Physical Society, DPOLY Invited Session: Polymer Glasses in Confinement and Deformation, New Orleans, LA, March 2017.
- " $T_g$  and Enthalpy Recovery in Ultrathin Films," Flash DSC Conference, Nanjing, China, December 2016.
- " $T_g$  and Enthalpy Recovery," Invited Tutorial for Workshop on Calorimetry, Nanjing University, Nanjing, China, December 2016.
- "Structural Recovery of Glass-Forming Materials," Southwest Regional Meeting of the American Chemical Society, Galveston, TX, November 2016.
- "Polymer Chemistry and Physics at the Nanoscale," Princeton University, Department of Chemical Engineering, October 2016.
- "The Glass Transition and Polymerization in Nanoconfined Systems," Gordon Research Conference on Polymer Physics, July 2016.
- "Intrinsic Size Effects, Surface Effects, and  $T_g$  at the Nanoscale," 8th International Conference on Times of Polymers and Composites, Ischia, Italy, June 2016.
- "The Glass Transition and Polymerization in Nanoconfined Systems," National Institute of Applied Sciences of Lyon, Lyon, France, December 2015.
- "The Glass Transition and Structural Recovery of Glass-Forming Materials with Flash DSC," Flash DSC Conference, Greifensee and Zurich, Switzerland, December 2015.
- "Structural Recovery of Glass-Forming Materials," 5th International Symposium on Polymer Materials Science, Kyoto Institute of Technology, Kyoto, Japan, November 2015.
- "Kinetics and Thermodynamics in Nanoconfined Polymerizations," AIChE Fall Meeting, Plenary Lecture for Division 8a, Salt Lake City, Utah, November 2015.

"The Glass Transition and Polymerization Kinetics in Nanoconfined Systems," University of Rochester, Department of Chemical Engineering, April 2015.

"Structural Recovery of Glass Forming Materials," March Meeting of the American Physical Society, DPOLY Focus Session: Manipulating Glasses, Theory and Experiment; San Antonio, TX, March 2015.

"The Calorimetric Glass Transition Under Nanoconfinement," 2014 Meeting of the American Institute of Chemical Engineers (AIChE), Materials Engineering and Sciences Division, Atlanta, GA, November 2014.

"NATAS Outstanding Achievement Award sponsored by Mettler Toledo: The Physical Chemistry of Soft Matter: Interrogation using Calorimetry," Plenary lecture at the 42nd annual meeting of the North American Thermal Analysis Society, Santa Fe, NM, September 2014.

"Chemistry and Physics at the Nanoscale," 42nd annual meeting of the North American Thermal Analysis Society, Symposium in Honor of Prof. S. Z. D. Cheng, Santa Fe, NM, September 2014.

" $T_g$  and Structural Recovery of Single Polystyrene Films," 7th International Conference on Times of Polymers and Composites, Ischia, Italy, June 2014.

" $T_g$ , Structural Recovery, and Crystallization at the Nanoscale," 13th Lahnwitzseminar on Calorimetry, Rostock-Warnemunde, Germany, June 2014.

"The Shear and Bulk Rheology of Polymers and Nanocomposites." Society of Plastics Engineers Annual Technical Meeting, Applied Rheology Group, Las Vegas, NV, April 2014.

"Interrogation of Soft Materials using Calorimetry and Thermal Analysis," American Chemical Society, Spring Meeting, Symposium in Honor of Prof. B. Wunderlich, Dallas, March 2014.

"Effect of Crosslink Density and Molecular Size on the  $T_g$  Depression under Nanoconfinement," 2013 Fall Meeting of the Materials Research Society (MRS), December 2013.

"The Calorimetric Glass Transition under Nanoconfinement," Golden Gate Polymer Forum, Mountain View, CA, November 2013.

"Kinetics and Thermodynamics of Nanoconfined Polymerizations," Macromolecular Symposium, Case Western University, September 2013.

"The Temperature and Pressure Dependence of Relaxation Times Near  $T_g$  in Bulk and Nanoconfined Systems," 7th International Discussion Meeting in Complex Systems, Barcelona, July 2013.

"The Glass Transition and Polymerization Kinetics in Nanoconfined Systems," Nanjing University, June 2013.

"Polymer Physics and Chemistry at the Nanoscale," Chinese Academy of Sciences, June 2103.

"Kinetics and Thermodynamics in Nanoconfined Polymerizations," Tianjin University, June 2013.

"The Calorimetric Glass Transition under Nanoconfinement," Beijing University of Chemical Technology, June 2013.

"Outreach in Polymers at Texas Tech," American Chemical Society, Spring Meeting, Symposium in Honor of Prof. Peggy Cebe, New Orleans, April 2013.

"Polymer Physics and Chemistry at the Nanoscale," Arizona State University, Department of Chemical Engineering, February 2013.

"The Calorimetric Glass Transition under Nanoconfinement," Inaugural Texas Soft Matter Meeting, University of Houston, January 2013.

## **Research Grants Funded**

Total Funding: \$ 8,157,372 of which \$ 4,909,492 is designated as my contribution

Total Funding as Principal Investigator (PI): \$ 5,708,936 of which \$ 4,067,427 is my contribution

43. Novel Glassy Energetic Materials (GEMS), DOD-Defense Ordnance Technology Consortium, \$ 475,000, 3/27/17 - 4/20/19, Contribution: 25 % as coPI with PI G. B. McKenna (ChE) and coPIs Rajesh Khare and Brandon Weeks (ChE).
42. GOALI/Collaborative Research: Processing and Stability of Amorphous Dispersions for Advanced Pharmaceutical Applications, National Science Foundation, \$ 253,742, 6/1/17-5/31/20, Contribution: 50 % as coPI with PI G. B. McKenna (ChE).
41. The Rigid Amorphous Fraction in Semicrystalline Polymers: Investigating Open Questions with Volume Dilatometry, American Chemical Society Petroleum Research Fund, \$ 110,000, 7/1/16 - 8/31/19 (one-year no cost extension), Contribution: 100 % as sole PI.
40. Chain Entropy and Polymerization Thermodynamics: Quantifying Nanoconfinement Effects, National Science Foundation, \$ 390,000, 5/1/16 - 4/30/19, Contribution: 100 % as sole PI.
39. Rheological Characterization of Ballistic Witness Materials and Performance Additives Utilized in Body Armor, NIST, \$86,981, 7/1/15 - 6/30/16, Contribution: 50 % as PI with coPI G. B. McKenna (ChE).
38. Spray-on Forage Cover, III Agri-Enterprises, LLC, \$13,648, 3/1/15 - 8/31/15, Contribution: 50 % as PI with coPI G. B. McKenna (ChE).
37. Nanoconfinement and its Influence on Polymerization, National Science Foundation, \$ 376,002, 10/1/12 - 9/30/14, Contribution: 55 % as PI with coPI E. L. Quitevis (Chem).
36. "Thermodynamics of Nanoconfined Equilibrium Polymerizations," American Chemical Society-Petroleum Research Fund, \$ 100,000, 6/1/12 - 8/31/14, Contribution: 100 % as sole PI.
35. Relaxation Dynamics in Selenide-Based Chalcogenide Glasses: Characterization of the Intermediate Phase, National Science Foundation, \$ 300,000, 8/1/11 - 7/31/14, Contribution: 50 % as PI with co-PI G. B. McKenna (ChE).
34.  $T_g$  Changes, Surface Effects, and Dynamics in Nanoconfined Polymers, National Science Foundation, \$480,000, 5/1/10 - 4/30/14, Contribution: 100 % as PI.
33. EAGER: Peptide Affinity Membranes for Binding Influenza Viruses: H1N1 and H5H1, National Science Foundation, \$300,000, 9/15/09 - 8/31/12, Contribution: 33 % as coPI with PI M. N. Karim (ChE).
32. Matrix Confinement Effects in Composites and Nanocomposites: Experiments and Molecular Modeling, National Science Foundation, \$ 250,000, 8/1/08 - 7/31/11, Contribution: 50 % as PI with co-PI R. Khare (ChE).
31. Physical Aging and Volume Relaxation of Nanocomposites, Texas Tech University Vice President for Research, Research Enrichment Fund, \$ 35,000, 6/1/08 - 8/31/09, Contribution: 100% as sole PI.
30. Origin of Enhanced Reactivity and Depressed  $T_g$  for Network Polymers at the Nanoscale, Texas Higher Education Coordinating Board Advanced Research Program (APR), \$ 150,000, 5/1/08 - 4/30/10, Contribution: 100% as sole PI.
29. Novel Nanoparticle-Filled Matrices for Thermal Stress Reduction in Polymer Matrix Composites: Multi-Scale Modeling and Experimental Validation, NASA Fundamental Aeronautics Program, \$ 450,000, 1/12/07 - 1/11/10, Contribution: 30% as PI with co-PIs G. B. McKenna, R. Khare, J. Leggoe, (all ChE) and I. Sevostianov (NMSU).

28. Cure and Properties of Thermosetting Materials at the Nanoscale, American Chemical Society - Petroleum Research Fund, \$ 80,000, 9/1/06 - 8/31/08, Contribution: 100 % as sole PI.
27. Polymer Chain Length and Branching Effects on the Viscoelastic Bulk Modulus and Structural Recovery at High Pressure, National Science Foundation, \$ 440,000, 5/1/06 - 4/31/10, Contribution: 100 % as sole PI.
26. Mettler-Toledo Thermal Analysis Education Grant, Mettler-Toledo, \$ 210,045 (as equipment), 9/1/05 - 8/31/06, Contribution: 40 % as PI with co-PIs D. Casadonte (Chem) and I. Rivero (IE).
25. Coming to a New Understanding of Volume Relaxation in Polymeric Glasses, American Chemical Society-Petroleum Research Foundation, \$ 80,000, 7/1/03 - 8/31/06, Contribution: 100 % as sole PI. [Note: ORS erroneously logged in \$ 46,577 and the error cannot be corrected.]
24. NIRT: Dynamic Heterogeneity and the Behavior of Glass-Forming Materials at the Nanoscale, National Science Foundation, \$ 1,000,000, 6/1/03 - 5/31/07, Contribution: 40 % as PI with co-PIs G. B. McKenna (ChE), E. L. Quitevis (Chem), and R. Richert (Arizona State University). An NSF NUE subgrant of \$ 2,500 was also received for this project.
23. A Fundamental Study of the Bulk Modulus of Polymers and Its Dependence on Chemical Structure, National Science Foundation, \$ 306,000, 5/1/03 - 4/30/06, Contribution: 100 % as sole PI.
22. Supercritical Carbon Dioxide Extraction Process for Forming Nanoporous Materials for Low-k and Biosensor Applications, National Science Foundation NER, \$ 99,986, 6/1/02 - 5/31/03, Contribution: 50 % as PI with S. Gangopadhyay (Physics) as co-PI.
21. Supercritical Carbon Dioxide Process for Forming Porous Dielectric Materials and for Removal of Photoresist Residue, Semiconductor Research Corporation, \$ 95,154 (in two grants), 1/1/02 - 2/31/03, Contribution: 40 % as co-PI with S. Gangopadhyay (Physics, PI) and H. Temkin (EE).
20. Supercritical CO<sub>2</sub> Cleaning Plasma-Treated Low-k Dielectrics, Tokyo Electronics, \$ 14,375, 9/1/01 - 8/31/02, Contribution: 50 % as co-PI with S. Gangopadhyay (Physics) as PI.
19. Residual Stresses in Thermosetting Resins for Polymer Matrix Composites: Modeling and Effects on Long-Term Performance, Air Force Office of Scientific Research, \$ 571,629, 12/1/00 - 11/30/03, Contribution: 50 % as co-PI with G. B. McKenna (ChE) as PI.
18. Novel Nanoporous Organosilicate Films for Next Generation Interconnects, Semiconductor Research Corporation, \$ 50,000, 9/1/00 - 8/31/01, Contribution: 50 % as co-PI with S. Gangopadhyay (Physics) as PI; continuation of item 14. [Note: ORS attributed 30 % of this grant to me but my sub-account was for half of the funds.]
17. A Fundamental Study of the Bulk Modulus during Cure of Thermosetting Polymers, American Chemical Society-Petroleum Research Foundation, \$ 60,000, 9/1/00 - 8/31/02, Contribution: 100 % as sole PI.
16. Increasing Teaching Effectiveness in Chemical Engineering: A Faculty Development Proposal, TTU Teaching, Learning, and Technology Faculty Incentive Grants, \$ 5,000, 9/1/00 - 8/31/01, Contribution: 95% as PI with co-PIs A. L. Graham (ChE) and R. Desrosiers (ChE).
15. Effects of Cure and Resin Properties on Residual Stress Development in Thermosetting Resins, The Aerospace Corporation, \$ 65,643, 6/1/00 - 9/30/00, Contribution: 50 % as co-PI with G. B. McKenna (ChE) as PI.

14. Novel Nanoporous Organosilicate Films for Next Generation Interconnects, Semiconductor Research Corporation, \$ 18,100, 1/1/00 - 12/31/00, Contribution: 50 % as PI with S. Gangopadhyay (Physics) as co-PI; project continued - see item 18.
13. Deposition and Process Integration of Low-k Porous Fluorocarbon ILD Films for ULSI Circuits, Texas Higher Education Coordinating Board, \$ 151,000, 1/1/00 - 12/31/01, Contribution: 50 % as co-PI with S. Gangopadhyay (Physics) as PI.
12. Development of a New Class of Thermal Stabilizers for Polymers, University of Pittsburgh CRDF, \$ 16,000, 7/1/98 - 6/30/00, Contribution: 100 % as sole PI.
11. Volume and Enthalpy Recovery of Glass-Formers in the Absence of Material Nonlinearities, American Chemical Society-Petroleum Research Foundation, \$ 50,000, 8/1/97 - 7/31/99, Contribution: 100 % as sole PI.
10. Shrinkage and Viscoelastic Properties during Cure of an Epoxy Resin, General Electric Corporation, \$ 61,000, 7/1/97 - 6/30/98, Contribution: 100 % as sole PI.
9. Viscoelastic Behavior of Inorganic Glass-Formers, National Science Foundation, \$ 257,000, 8/15/96 - 1/31/00, Contribution: 50 % as co-PI with D. J. Plazek (MSE, Univ. Pitt.) as PI.
8. Time-Dependent Properties of Polymeric Materials: Effect of Orientation and Internal Stresses, Alcoa Foundation, \$ 7,500, 4/1/96 - 3/31/97, Contribution: 100 % as sole PI.
7. Engineering Research Equipment: Thermal Analysis System Upgrade, National Science Foundation, \$ 22,368, 2/15/95 - 1/31/97, Contribution: 100 % as sole PI.
6. Engineering Research Equipment: Research Series FT-IR Spectrometer, National Science Foundation, \$ 38,153, 3/15/95 - 2/28/97, Contribution: 15 % as co-PI with E. J. Beckman (Ch E, Univ. Pitt.) as PI and four others.
5. Acquisition of a 300 MHz NMR Instrument, \$ 176,750, 8/15/94 - 7/31/96, National Science Foundation, Contribution: 5 % as co-PI with E. J. Beckman (Ch E, Univ. Pitt.) as PI and eleven others.
4. Effect of Cure Cycle and Gelation Temperature on Adhesion in Polymer Metal Bonds, University of Pittsburgh CRDF, \$ 13,700, 7/1/94 - 6/30/95, Contribution: 100 % as sole PI.
3. Effect of Network Parameters on the Properties of Polycyanurate Thermosetting Polymers, National Science Foundation, \$ 156,000, 7/1/94 - 6/30/97, Contribution: 100 % as sole PI.
2. Coefficient of Friction and Permanent Set of Rubber Probe Cover, Ben Franklin Foundation, \$ 14,056, 2/1/94 - 1/31/95, Contribution: 100 % as sole PI.
1. Effect of Network Parameters on the Properties of Dicyanate Ester/Polycyanurate Thermosetting Material, American Chemical Society - Petroleum Research Fund, \$ 20,000, 6/1/93 - 8/31/94, Contribution: 100 % as sole PI.

## Courses Taught

TTU course numbers: the first number indicates the level of the course, with 1-6 indicating freshman through advanced graduate.

\* indicates University of Pittsburgh course number, where 1000 level courses are undergraduate courses and 2000 level are graduate courses.

- Ch E 1121**      **Chemical Engineering Seminar**  
Readings and discussion of the chemical engineering profession, history, ethics, career paths, and research opportunities. (Writing Intensive)
- Ch E 2306**      **Exposition of Technical Information**  
Organization and presentation of experimental data, and research interpretation and conclusions. Computer-aided preparation of engineering reports. Meets oral communication requirement for University; includes instruction in engineering ethics. (Writing Intensive)
- Ch E 2321**      **Chemical Engineering Thermodynamics I**  
First and second laws of thermodynamics, thermophysical and thermodynamic properties of ideal and real gases, heat engines, refrigeration cycles.
- Ch E 3322**      **Chemical Engineering Thermodynamics II**  
Thermophysical and thermodynamic properties of real gases and real gas mixtures, vapor-liquid equilibrium, chemical reaction equilibrium.
- Ch E 4122**      **Chemical Engineering Review**  
Review of chemical engineering science and engineering courses. Preparation for the chemical engineering portion of the FE exam and the chemical engineering capstone design project.
- Ch E 4323**      **Chemical Reaction Engineering**  
An introduction to the kinetics of chemical conversion processes and design of chemical reactors.
- Ch E 4341/5341**      **Polymerization Engineering**  
Kinetics of polymerization reactions, effect of polymerization system, implications of kinetics for reactor and process design, branching and gelation.
- Ch E 4344/5344**      **Polymer and Materials Laboratory**  
Synthesis and properties of materials including polymers, polymerization, transitions, phase separation, mechanical properties and processing.
- Ch E 5121/7121**      **Graduate Research Seminar**  
Organization of departmental seminar series.
- Ch E 5321**      **Advanced Thermodynamics**  
Classical thermodynamics, Legendre transforms, equilibrium and stability, statistical mechanics.
- Ch E 5640**      **Topics in Polymers and Materials Science**  
Current research topics and laboratory experience in the area of polymers, composites, rheology, and materials science (cotaught with two other professors).
- Ch E 7122**      **Polymer and Materials Seminar**  
Discussion of current literature and research in polymers and materials.
- ChE 0035\***      **Introduction to Chemical Engineering**  
Mass and energy balances applied to chemical processes, including multiple-unit processes with recycle, PVT properties of gases and gas-vapor mixtures, thermochemistry, combined material and energy balances, and vapor-liquid equilibrium.
- Ch E 1013\***      **Unit Operations Laboratory**  
Distillation, flow in stirred tanks, polymerization kinetics, heat transfer.
- Ch E 1752/2752\***      **Introduction to Polymer Physics**  
Chain dynamics, solution thermodynamics, crystallization and glass transition behavior, rubber elasticity, viscous flow, viscoelasticity, mechanical properties.
- Ch E 2640\***      **Pollution Prevention**  
Case studies of methods to prevent pollution.
- Ch E 2982\***      **Issues in Teaching and Research**  
Learning and teaching styles, effective presentations, grading, ethics, scientific method, proposal writing.

## **Student Teaching Evaluations** (Last Five Years)\*

<u>Course</u>	<u>Typical Class Size</u>	<u>2017/18</u>	<u>2016/17</u>	<u>2015/16</u>	<u>2014/15</u>	<u>2013/14</u>
ChE 4341/5341 Polym. Eng.	20	4.9,4.9,4.9		4.8,4.7,4.7		
ChE 4344/5344 Polym. Mat. Lab.	15		4.5,4.7,4.8		4.7,4.7,5.0	
ChE 5321 Adv. ChE Thermo.	14					4.3,4.4

\* Scores are out of 5.0 maximum for questions 1 (course objectives), 2 (effectiveness), and 3 (valuable learning experience) from 2014/15; prior to that, scores are for questions 1 (instructor effectiveness) and 11 (overall value).

## **Graduate Theses Supervised**

Students Graduated: 8 M.S. and 13 Ph.D. Students  
Current Group: 8 Ph.D. Students, 2 Post-Doctoral Researchers

29. Chunhao Zhai, Ph.D.
28. Alex Zapata, Ph.D.
27. Xiao Zhao, Ph.D., passed qualifying exam.
26. Qian Tian, Ph.D., passed qualifying exam.
25. Rozana Bari, Ph.D., passed qualifying exam.
24. Nazam Sakib, Ph.D., passed qualifying exam.
23. Madhu Pallaka, Ph.D. expected 2019: Polymerization under nanoconfinement.
22. Evelyn Lopez, Ph.D. expected 2019;  $T_g$  under nanoconfinement.
21. Ran Tan, Ph.D. May 2015, Thermophysical and Rheological Properties of Polymer Nanocomposite and Ionic Liquids
20. Siyang Gao, Ph.D., May 2015, The Glass Transition Kinetics In Bulk Polymers And Ultrathin Films And Reaction Kinetics For Cyclopentadiene Demerization
19. Haoyu Zhao, Ph.D. December 2014; Nanoconfined MMA Polymerization and Structural Recovery in Ge-Se Glasses
18. Fatema Begum, Ph.D. August 2012; Texas Tech University, The Effects of Nanoconfinement on the Kinetics and Thermodynamics of Free Radical Polymerization Reactions.
17. Maitri Vaddey, M.S., December 2011, Texas Tech University, Nanoconfined Ring-Opening Metathesis Polymerization of Dicyclopentadiene.
16. Jiayi Guo, Ph.D., May 2011, Texas Tech University, Architecture Effects on the Bulk and Shear Rheology and PVT Behavior of Polymers.
15. Yung P. Koh, Ph.D. October 2010, Texas Tech University, The Glass Transition at the Nanoscale.
14. Wei Zheng, Ph.D., April 2008, Texas Tech University, The Glass Transition of Confined and Heterogeneous Systems
13. Yan Meng, Ph.D., December 2007, Texas Tech University, The Bulk Modulus of Polystyrene and Cure of Thermosetting Resins.
12. Prashanth Badrinarayanan, Ph.D., October 2007, Texas Tech University, Glass Transition Kinetics in Amorphous Polymers.
11. Juan Sun, Ph.D., September 2004, Texas Tech University, Thermodynamics and Kinetics at the Nanoscale: Thermal Behavior of Aluminum Nanoparticles and Development of Nanoporous Low-k Dielectrics.
10. Srinivas Kolla, M.S., October 2003, Texas Tech University, Volume Recovery of an Epoxy Material: Resolution of the  $\tau_{eff}$  Paradox.

9. Prathamesh Doshi, M.S., April 2002, Texas Tech University, Modeling Nanoporosity Development in Thin Film Polymers for Low-k (Dielectric) Applications.
8. Patricia Prasatya, M.S., March 2000, University of Pittsburgh, Calculation of Residual Stress Development during Cure of Thermosets using a Viscoelastic Model.
7. Alia Rdissi, M.S., June 2000, University of Pittsburgh, Polymer Thermal Degradation: Enhancing PMMA Thermal Stability and Modeling Weight Loss Experiments.
6. J. William Sobieski, Ph.D., October 1999, University of Pittsburgh, Structural Recovery of Polymeric Glass-Formers: Dilatometric Studies and Model Calculations.
5. Kevin Bernatz, Ph.D., September 1999, University of Pittsburgh, Viscoelastic Behavior of Glasses: Selenium, Boron Trioxide, and Polystyrene (co-advised by Donald J. Plazek).
4. Ramsey Zacharia, Ph.D., August 1998, University of Pittsburgh, Identifying and Minimizing the Effect of Residual Polymerization Catalyst on Thermal Stability.
3. Zavier Guillas, M.S., January 1998, University of Pittsburgh, Effects of Cold-Drawing on the Length and Enthalpy Recovery of Polycarbonate.
2. Eric T. McGregor, M.S., January 1996, University of Pittsburgh, Volume Relaxation of Glassy Polyetherimide.
1. Ping-Chung Su, M.S., August 1994, University of Pittsburgh, Physical Aging of Polyetherimide.

### **Post-Doctoral Associates Supervised**

- Haoyu Zhao, January 2015 - present, Equilibrium Reactions under Nanoconfinement.
- Yung P. Koh, December 2010 - present, Reaction Kinetics and  $T_g$  at the Nanoscale.
- Wei Zheng, September 2008 - November 2010, Rheology and Thermodynamics of Oligomer/Polymer Blend.
- Qingxiu Li, May 2004 - December 2008, Property Evolution and Size Effects in Thermosetting Materials.
- Mikhail Merzliakov, July 2001 - May 2004, Residual Stresses in Thermosetting Resins (joint with Prof. G. B. McKenna).
- Paul Bernazzani, June 2000 - July 2003,  $T_g$  and Structural Recovery of Glass-Formers.
- Dinghai Huang, January 2001 - April 2003, Heat Capacity Measurements (joint with Prof. G. B. McKenna).
- Mataz Alcoutlabi, July 2000 - December 2001, Residual Stresses in Composites (joint with Prof. G. B. McKenna).
- Quamrul Arefeen, September 2000 - November 2000, Low-k Organosilicate Dielectrics.
- Isabel Echeverria, July 1998 - August 1999, Viscoelastic Properties of Inorganic Glass-Formers (joint with Prof. D. J. Plazek).
- Lili Giri, November 1997 - June 1999, Enthalpy Recovery of Polymers.
- Olivier Sindt, July 1997 - July 1998, Evolution of Properties during Thermoset Cure.

### **Selected Service to Professional Organizations**

MRS Fall Meeting, co-organizer, Thermal Analysis Symposium, 2018 Fall Meeting.  
American Institute of Chemical Engineers, Co-Chair, Div. 8a (Polymers), Nov. 2017-present.  
Society of Plastics Engineers: Research/Technology Award Committee 2014 - 2017;  
International Award Committee, 2006, 2007; Polymer Analysis Division: Chair, 2000/2001;  
Newsletter Editor, May 2001 - 2006; ANTEC Technical Program Chair, May 2005  
(Charlotte, NC) and May 2000 (Dallas, TX); Board of Directors, 1997 - 2007.  
North American Thermal Analysis Society: Conference Chair, 2014 Annual Meeting; Technical  
Program Chair, 2012 Annual Meeting; Conference Chair, 2009 Annual Meeting; Executive  
Counselor, 2006; President, 2005; Vice President, 2004.  
NaTex Texas and Southwest Thermal Analysis and Rheology Forum (local section of the North  
American Thermal Analysis Society): President, 2005; Vice-President, 2004; Mini-  
Symposium and Poster Session Conference Co-Organizer with R. Khare (2008, Dallas, TX),  
with L. Dai (2004, Dallas, TX), with N. D'Souza (2003, Houston, TX).  
American Physical Society: Short Course on Glasses, co-organized by G. B. McKenna, 2015  
March Meeting; Division of Polymer Physics (DPOLY) Nominating Committee 2014;  
DPOLY Education Committee, 2006, 2007.

### **Guest Editor/Editorial Boards/Reviewer**

Editorial Boards: Thermochimica Acta, 2006 - present; Polymer, 2006 - present; Journal of  
Polymer Science: Part B: Polymer Physics, 2003 - present.  
Guest Editor, Journal of Thermal Analysis and Calorimetry, issue devoted to the 37th annual  
NATAS meeting, 2010.  
Reviewer for NSF proposals and ACS-PRF proposals.  
Reviewer for European Physical Journal E: Soft Matter, Journal of Chemical Physics, Journal of  
Composites A, Journal of Polymer Science: Part B: Polymer Physics, Journal of Thermal Analysis  
and Calorimetry, Macromolecular Chemistry and Physics, Macromolecular Rapid Communications,  
Macromolecules, Physical Review E, Polymer, Polymer Engineering and Science, Progress in  
Polymer Science, Review of Scientific Instruments, Thermochimica Acta.

### **Recent Organization of Research Symposia and Short Courses**

APS DPOLY Short Course on Glasses, "The Glass Transition in Polymers, Small Molecule  
Glass Formers, and Colloids: Recent Advances in Theory, Experiment, and Open  
Challenges," March 2015; co-organizer with G. B. McKenna (TTU).  
Gordon Research Conference for Polymer Physics, Chair, 2014, Discussion Leader 2012.  
APS DPOLY Short Course on Glasses, "The Glass Transition in Polymers, Small Molecule  
Glass Formers, and Colloids: Recent Advances in Theory, Experiment, and Open  
Challenges," March 1, 2015; co-organizer with G. B. McKenna (TTU).  
"Materials Science at the Nanoscale," Seventh Annual NaTex Mini-Symposium and Poster  
Session, Texas and Southwest Thermal Analysis and Rheology Forum (section of NATAS),  
Dallas, TX, May 2008; co-organizer with R. Khare (TTU).

### **Recent Departmental Service** (to the Department of Chemical Engineering)

Whitacre Department Chair, Sept. 2012 - present.

Associate Chair, Sept. 2007 - 2012.

Undergraduate Committee Chair (incl. ABET accreditation responsibilities since 2000), 1999 - 2012 (excluding 2006/07).

Undergraduate Faculty Advisor, 2001 - 2012 (excluding 2006/07).

Advisor for Polymer and Materials Minor, Texas Tech University, May 2001 - 2012.

Faculty Departmental Search Committee, Chair: 2011/12, 2007/08, 1999/2000.

Faculty Departmental Search Committee, Member, 2010/11, 2004/05.

### **Recent College Service**

Industrial Engineering Department Chair Search Committee, Committee Chair, 2012/13.

College of Engineering, Faculty Research Awards Committee, Chair 2012; Member 2009-11.

College of Engineering Tenure Committee, Texas Tech University, 2007 - 2012; 2003 - 2004.

Lead organizer of First Annual COE Senior Design Expo, senior design poster competition and teaming workshop, April 2009.

### **Recent University Service**

Provost's Faculty Success Task Force, 2017/18 and 2018/19.

Provost Search Committee, 2016/17.

Provost's Review Committee for Whitacre College of Engineering Dean, 2015/16.

Industrial Hub Research Park, Director Search Committee, 2015/16.

Industrial Hub Research Park, Advisory Board Member, 2014/15.

Vice President for Research Search Committee, 2013/14.

Vice President for Research Search Committee, 2013.

Industrial Engineering Graduate Program Review, Committee Chair, Spring, 2013.

Strategic Planning Council Working Group on *Priority 3: Expand and Enhance Research and Creative Scholarship*; appointed by VPR Eighmy, 2011/12.

Undergraduate Research Task Force, appointed by VPR Eighmy, 2011.

Misconduct in Research and Scholarly Activity, Investigation Committee Chair for an NSF-initiated plagiarism case, appointed by VPR Eighmy, 2009/10.

Vice President for Research Search Committee, Texas Tech University, 2008/09.

### **Outreach**

Faculty Organizer for Science–It's a Girl Thing Program, for junior-high school girls. The girls attended our program for approximately 15 - 16 hours over three to four days from 2010 to 2014. From 2015-2018, the girls attended our program for 8 hours over four days. Experiments were similar but more advanced than those in Super Saturdays and also included investigating polymer crystallization and making bread.