

Priti Xavier

Curriculum Vitæ

Department of Materials Engineering,
Indian Institute of Science,
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Education

2011
2016

Ph.D. Materials Engineering, Indian Institute of Science, Bangalore.

2008
2010

M.Sc. Chemistry, Loyola College, Madras University, Chennai.

Passed with distinction

2005
2008

B.Sc. Chemistry, St. Joseph's College, Calicut University, Kozhikode.

Passed with distinction

PhD thesis

- Title** *Mapping the transient morphologies and the demixing behavior in PS/PVME blends in presence of multiwall carbon nanotubes*
- Supervisor** Dr. Suryasarathi Bose
- Description** My PhD thesis is focused on obtaining a fundamental understanding of the interplay between structure and dynamics in the polymer blend polystyrene/ poly(vinyl methyl ether)PS/PVME and the effect of multiwall carbon nanotubes (MWNTs) in the same. The evolution of multiphase polymer micro structures by thermally induced phase separation (TIPS) in this LCST polymer blend and its structure-property correlations at various time scales/ temperature regimes was carried out using the characterization techniques such as Rheology, Differential Scanning Calorimetry, Dielectric Spectroscopy and Atomic Force Microscopy. Similar studies were extended on the effect of chain-end grafted nanoparticles (with various length of polymer brushes) in the demixing of the blend and particle localization. The different structures designed by TIPS have been further used to fabricate membranes for water purification. Electrically conducting blends of the same polymer have also been used to prepare electromagnetic shielding materials/coatings.

Master thesis

Title	<i>Synthesis, characterization and dielectric studies of unsymmetrical stilbenes</i>
Supervisor	Dr Jeya Rajendran
Description	Three new unsymmetrical stilbene derivatives, with high dielectric constant have been synthesized by the condensation of p-nitro phenylacetic acid and different substituted benzaldehyde via Knoevenagel condensation. The synthesized compounds 4-hydroxy-4'-nitrostilbene, 4-propoxy-4' nitrostilbene, 4-butoxy-4' nitrostilbene were characterized by various spectroscopies and thermal analysis. Dielectric analysis of these samples showed a varying dielectric constant with respect to the electron donor groups present.

Additional projects

- Currently involved in a project for developing electromagnetic compatible composite of polyvinylidene difluoride with manganese ferrite
- Currently involved in a project for developing of thermoset-thermoplastic blend for rigid and reversible adhesive

Achievements

- Best Poster Award, 5th Molecular Materials Meeting, Singapore, August 3, 2015
- Best Poster Award, Advancements in Polymeric Materials -APM 2015, Indian Institute of Science, Bangalore, India, February 19, 2015
- DST travel grant, August 2014 for attending 248th ACS National Meeting
- UGC-Basic Science Research fellowship for the year 2013-14
- Travel award, International Workshop on Advanced Materials Ras Al Khaima Centre for Advanced Materials, UAE, 2013
- Qualified Lectureship [UGC-National Eligibility Test] (all India rank 29) in Chemical Sciences June 2011
- Best paper (third) Chemistry: Current Focus, Madras Christian College, Chennai, March 24th 2010.

Teaching Experience

2013
2014

Teaching Assistant, Indian Institute of Science.

- Undergraduate and Postgraduate Polymer Processing Laboratory Techniques

Skills

Training & Experience

- Controlled radical polymerization techniques such as ATRP, RAFT
- Rheometer
- Haake Minilab micro compounder, Injection moulding, Compression moulding
- Vector Network Analyzer, Impedance analyzer, LCR meter
- Polarizing Optical Microscopy
- Cryo-ultramicrotomy
- SEM, TEM
- DSC, TGA, DMA
- FTIR spectroscopy, UV-Visible spectroscopy

Computer Skills

Tools ImageJ, Origin, Shape Software, **Programming** C/C++, Matlab, \LaTeX , Linux ChemSketch

Relevant Courses

2011

Concepts in Polymer Blends and Nanocomposites, Polymer Science and Engineering, Polymer Science and Engineering-Organic Photovoltaics, Thermodynamics and Kinetics, Electron Microscopy in Material Characterization, Analytical Instrumentation, As part of PhD coursework.

2014

Beauty, Form and Function An Exploration of Symmetry, Verified certificate from Coursera offered by NTU Singapore.

2015

Relaxation in Materials, Summer course from Indian Institute of Science.

Journal Publications

2016

Xavier, Priti and Suryasarathi Bose. "Nanomechanical Mapping, Hierarchical Polymer Dynamics, and Miscibility in the Presence of Chain-End Grafted Nanoparticles". In: *Macromolecules*.

2016

Xavier, Priti, Praveen Rao, and Suryasarathi Bose. "Nanoparticle induced miscibility in LCST polymer blends: critically assessing the enthalpic and entropic effects". In: *Physical Chemistry Chemical Physics* 18.1, pp. 47–64.

2016

Xavier, Priti, Shubham Jain, Kaushik Chatterjee, Suryasarathi Bose, et al. "Designer porous antibacterial membranes derived from thermally induced phase separation of PS/PVME blends decorated with an electrospun nanofiber scaffold". In: *RSC Advances* 6.13, pp. 10865–10872.

- 2015
Kar, Goutam Prasanna, Avanish Bharati, Priti Xavier, Giridhar Madras, and Suryasarathi Bose. "The key role of polymer grafted nanoparticles in the phase miscibility of an LCST mixture". In: *Physical Chemistry Chemical Physics* 17.2, pp. 868–877.
- 2015
Nair, Sharika Thankappan, P Poornima Vijayan, Priti Xavier, Suryasarathi Bose, Soney C George, and Sabu Thomas. "Selective localisation of multi walled carbon nanotubes in polypropylene/natural rubber blends to reduce the percolation threshold". In: *Composites Science and Technology* 116, pp. 9–17.
- 2015
Xavier, Priti and Suryasarathi Bose. "Mapping the intriguing transient morphologies and the demixing behavior in PS/PVME blends in the presence of rod-like nanoparticles". In: *Physical Chemistry Chemical Physics* 17.22, pp. 14972–14985.
- 2014
Bharati, Avanish, Priti Xavier, Goutam Prasanna Kar, Giridhar Madras, and Suryasarathi Bose. "Nanoparticle-Driven Intermolecular Cooperativity and Miscibility in Polystyrene/Poly (vinyl methyl ether) Blends". In: *The Journal of Physical Chemistry B* 118.8, pp. 2214–2225.
- 2014
Kar, Goutam Prasanna, Priti Xavier, and Suryasarathi Bose. "Polymer-grafted multiwall carbon nanotubes functionalized by nitrene chemistry: effect on cooperativity and phase miscibility". In: *Physical Chemistry Chemical Physics* 16.33, pp. 17811–17821.
- 2014
Xavier, Priti, Avanish Bharati, Giridhar Madras, and Suryasarathi Bose. "An unusual demixing behavior in PS–PVME blends in the presence of nanoparticles". In: *Physical Chemistry Chemical Physics* 16.39, pp. 21300–21309.
- 2014
Xavier, Priti and Suryasarathi Bose. "Confinement effects of MWNTs on the chain dynamics in dynamically asymmetric polymer blend PS/PVME polystyrene/poly (vinyl methyl ether)". In: *ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY* 248.
- 2014
Xavier, Priti and Suryasarathi Bose. "Electromagnetic shielding materials and coatings derived from gelation of multiwall carbon nanotubes in an LCST mixture". In: *RSC Advances* 4.98, pp. 55341–55348.
- 2014
Xavier, Priti and Suryasarathi Bose. "Non-equilibrium segmental dynamics driven by multiwall carbon nanotubes in PS/PVME blends". In: *Physical Chemistry Chemical Physics* 16.20, pp. 9309–9316.

- 2014
Xavier, Priti, Keshav Sharma, K Elayaraja, KS Vasu, AK Sood, and Suryasarathi Bose. "Reduced graphene oxide induced phase miscibility in polystyrene–poly (vinyl methyl ether) blends". In: *RSC Advances* 4.24, pp. 12376–12387.
- 2013
Xavier, Priti and Suryasarathi Bose. "Multiwalled-carbon-nanotube-induced miscibility in near-critical PS/PVME blends: assessment through concentration fluctuations and segmental relaxation". In: *The Journal of Physical Chemistry B* 117.28, pp. 8633–8646.

Conference Publications

- 2015
Xavier, Priti and Suryasarathi Bose. "Gelation of multiwall carbon nanotubes driven electromagnetic interference shielding effectiveness in polystyrene (PS)/ poly[vinyl methyl ether] (PVME) blend". In: APM 2014, organized by CIPET LARPM, under Department of Chemicals, Petrochemicals, Ministry of Chemicals, and Fertilizers, Govt. of India. Bangalore.
- 2015
Xavier, Priti and Suryasarathi Bose. "Electromagnetic shielding materials and coatings derived from confinement of highly anisotropic nanoparticles in an LCST mixture". In: 5th Molecular Materials Meeting. Singapore.
- 2014
Xavier, Priti and Suryasarathi Bose. "Confinement effects of MWNTs on the chain dynamics in dynamically asymmetric polymer blend PS/PVME". In: 248th ACS National meeting and exposition. San Francisco.
- 2013
Bharati, Avanish, Priti Xavier, Giridhar Madras, and Suryasarathi Bose. "Effect of silver nanoparticles on phase seapartion and segmental dynamics of PS/PVME blends". In: FAPS-Macro. Bangalore.
- 2013
Xavier, Priti and Suryasarathi Bose. "Concentration Fluctuation and Segmental Relaxation studies in PS/PVME [polystyrene/poly (vinyl methyl ether)] blends with nanoparticles". In: Polymer Processing Society. Mumbai.
- 2013
Xavier, Priti and Suryasarathi Bose. "Multiwall carbon nanotubes induced miscibility in PS/PVME blends". In: International Workshop on Advanced Materials. Ras Al Khaima, UAE.
- 2013
Xavier, Priti and Suryasarathi Bose. "Rheology as a tool to assess the effect of Multiwall carbon nanotubes (MWNTs) in the demixing of PS/PVME [polystyrene/poly(vinyl methyl ether)]". In: ICPAM. Kottayam.

Languages

English	Fluent
Hindi	Conversational
Tamil	Conversational
Malayalam	Mother Tongue