

# Priti Xavier

## Curriculum Vitæ

Department of Materials Engineering,  
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### Education

- 2011  
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 been used to prepare electromagnetic shielding materials/coatings.

### Master thesis

- Title *Dissertation title: Synthesis, characterization and dielectric studies of unsymmetrical stilbenes*
- Supervisor Dr Jeya Rajendran

**Description** Three new 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. The functional group dependent dielectric constant was compared in these three compounds using Dielectric Spectroscopy.

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## 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.

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## Teaching Experience

2013  
2014

**Teaching Assistant**, *Indian Institute of Science*.

- Undergraduate and Postgraduate Polymer Processing Laboratory Techniques

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## Skills

### Equipment Training & Experience

- Living polymerization techniques such as ATRP, RAFT
- Rheology
- Haake Minilab micro compounder, Injection moulding, Compression moulding
- Vector Network Analyzer, Impedance analyzer, LCR meter
- Polarizing Optical Microscopy
- Ultramicrotomy
- SEM, AFM, TEM
- DSC, TGA, DMA
- FTIR spectroscopy, UV-Visible spectroscopy

### Computer Skills

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

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## Relevant Courses

2014

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

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2015 • **Relaxation in Materials**, Summer course from Indian Institute of Science.

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## Journal Publications

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2016 • Xavier, Priti and Suryasarathi Bose. "Nanomechanical Mapping, Hierarchical Polymer Dynamics, and Miscibility in the Presence of Chain-End Grafted Nanoparticles". In: *Macromolecules*.

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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.

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2015 • Sharika, T, 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*.

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2015 • Xavier, Priti and Suryasarathi Bose. "Mapping the intriguing transient morphologies and the demixing behavior in PS/PVME blends in presence of rod-like nanoparticles". In: *Physical Chemistry Chemical Physics*.

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2015 • 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*.

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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.

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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.

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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.

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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. "Multiwall carbon nanotubes induced miscibility in PS/PVME blends". In: Rangotsav, Advances in polymers and Coatings, ICT. Mumbai.

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	Native	<i>Mother Tongue</i>

## References

### Dr Suryasarathi Bose

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### Prof Giridar Madras

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### Prof Sabu Thomas

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