

CURRICULUM VITAE

Name: Saibal Bhaumik

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Present position and work: Working as a Post-doctorate fellow at King Abdullah University of Science and Technology (KAUST). At present, I am working on the preparation of supramolecular block copolymers *via* noncovalent hydrogen-bonding interaction and study their phase separations. This research work is published in the ACS “Macromolecules” journal (*Macromolecules* 2020, 53, 6682-6689). I am also working on the development of polymer vitrimers for circular economy and self-healable thermoplastic elastomers *via* dynamic covalent bonding (DCB).

Academic Qualification:

2010–2016 Ph.D. in Polymer Chemistry: Thesis submitted to Academy of Scientific and Innovative Research (AcSIR), New Delhi.

Thesis title: “Improving Charge Transport via Self Assembly in Semiconducting Donor/Acceptor Supramolecular Polymers”.

Research Supervisor: Dr. S. K. Asha (Senior Principal Scientist, CSIR-NCL, Pune, Maharashtra, India).

2008–2010 M.Sc. Organic Chemistry – Ramakrishna Mission Residential College Narendrapur (Affiliated to the University of Calcutta), Kolkata, West Bengal, India.

2005–2008 B.Sc. Chemistry – Ramsaday College, University of Calcutta, West Bengal, India.

Academic Awards:

1. CSIR Senior Research Fellowship: Qualified in July 2012.

2. CSIR Junior Research Fellowship: Qualified National Eligibility Test for Ph.D. Admission and eligibility for Lectureship conducted by CSIR-UGC examination, held in December 2009.

3. GATE: Qualified

Work Experience:

- Research experience in anionic polymerization high vacuum technique.
- Synthesis of polymer vitrimers via dynamic covalent bonding.
- Synthesis of semiconducting donor-acceptor polymers and their structural characterization.

Research Experience:

- Strong synthetic hand on the synthesis of polymers by **anionic polymerization high vacuum technique**.
- Strong synthetic hand on the synthesis of **polymer vitrimers via dynamic covalent bonding**.
- Strong synthetic hand on the synthesis of semiconducting (donor and acceptor) polymers (side chain and main chain) by various polymerization methods such as **controlled free radical polymerization (ATRP, RAFT, etc.), photopolymerization, polycondensation, etc.**
- Experienced in using Schlenk line and high vacuum line for polymerization.
- Worked extensively in the synthesis of supramolecular semiconducting polymers to achieve desired morphology to get better device performance in optoelectronics.
- Design and synthesis of crosslinked semiconducting polymer network through noncovalent approach.
- Synthesis and modification of **high-performance polymer** such as **polybenzimidazole by condensation polymerization** method.
- Expertise in polymer characterization through NMR (¹H, ¹³C, DEPT, HSQC, and NOE), FTIR, Gel Permeation Chromatography (GPC), DSC, TGA, DLS, and MALDI-TOF. The polymers self-organization studies through Small Angle X-ray Scattering (SAXS), Polarized Light Microscope (PLM), microscopic techniques such as SEM, TEM, AFM and photophysical studies such as UV-Visible, Steady State Fluorescence, Lifetime studies, Time Resolved Emission Spectra (TRES).
- Polymer purification via repeated precipitation, soxhlet purification, and fractionation.

➤ Charge carrier mobility measurement of polymers via space charge limited current (SCLC) and organic field-effect transistor (OFET) methods.

Research Interest:

- Design and synthesis of functional multi-block copolymers to make complex macromolecular architecture via noncovalent chemistry.
- Design and synthesis of self-healing polymer vitrimers and thermoplastic elastomers.
- To study the self-assembling nature of various supra-molecular donor-acceptor polymers and their applications for various electronic devices like a solar cell, organic field-effect transistor (OFET) etc.
- To synthesize multi-functional monomers with hydrogen bonding site as well as polymerizing unit and further can be polymerized using different polymerization techniques such as anionic polymerization, free radical polymerization, controlled radical polymerization involving ATRP, RAFT, NMP, etc.
- Interested to learn and explore new areas of polymer chemistry and functional materials.
- Supramolecular self-healing polymers, liquid crystalline polymers, supramolecular nanomaterials, supramolecular crosslinked polymeric materials, etc.

Scientific Publications:

- 1. Saibal Bhaumik**, Konstantinos Ntetsikas, and Nikos Hadjichristidis. Noncovalent Supramolecular Diblock Copolymers: Synthesis and Microphase Separation. *Macromolecules* **2020**, *53* (15), 6682–6689.
- 2. Saibal Bhaumik**, Wenpeng Shan, Edwin L. Thomas, and Nikos Hadjichristidis. Synthesis and Characterization of Asymmetric A₁BA₂ Supramolecular Triblock Copolymer *via* Noncovalent Interaction: A solution and solid-state study. (Manuscript submitted).
- 3. Saibal Bhaumik**, Sandeep K. Sharma, Nikos Hadjicristidis. Construction of Complex Macromolecular Architecture in Polymers *via* Non-covalent Hydrogen-Bonding Interaction: Current Status and Future Perspective. (Manuscript under preparation).
- 4. B. Saibal**, A. Z. Ashar, R. Nandini Devib, K. S. Narayan, S. K. Asha. Nanostructured DonorAcceptor Self Assembly with Improved Photoconductivity. *ACS Appl. Mater. Interfaces* **2014**, *6*, 19434-19448.

5. **B. Saibal**, S. Chithiravel, S. K. Asha. P4VP and Oligo(phenylenevinylene)-perylenebisimide Mixed Donor-Acceptor Supramolecular Comb Polymer Complexes with Improved Charge Carrier Mobility. *J. Polym. Sci. Part A: Polym. Chem.* **2016**, *54*, 2403–2412.

6. **B. Saibal**, Rekha Narayan, S. Chithiravel, S. K. Asha. Improved Charge Carrier Mobility in Liquid Crystalline Supramolecular Crosslinked Polymer Complexes of Ditopic Rylenebisimides and P4VP. *J. Polym. Sci. Part A: Polym. Chem.* **2017**, *55*, 951–959.

[Highlighted as cover page]

7. Nagesh B. Kolhe, Shekhar Shinde, **B. Saibal**, and S. K. Asha. Novel Approaches in the Design of Donor-Acceptor Oligomeric and Polymeric Materials for Photovoltaic Applications: D/A Blend versus Self-assembly of D/A by Covalent or Non-Covalent Interaction. *Org. Photonics Photovolt.* **2015**, *3*, 71-100.

Patent:

1. Asha Syamakumari, Rekha. N, Shekhar. S, **B. Saibal**. Comb-Coil Supramolecular Crosslinked Polymer. Patent Publication number WO2013128475 A1, also published as DE112013001258T5, US20150111982, WO2013128475 A4.