CARRICULUM VITAE

Shrikant B. Nikam, Ph.D.

KAUST Catalysis Center,
Physical Science and Engineering Division,
King Abdullah University of Science and Technology (KAUST),
Thuwal, 23955–6900, Kingdom of Saudi Arabia
Mob. +966565255307 **Email** shrikant.nikam@kaust.edu.sa ORCID 0000-0001-6718-9002
LinkedIn www.linkedin.com/in/shrikant-nikam-1789505b/

Profile

I am a highly motivated, energetic, and disciplined individual with expertise in designing, developing, characterizing, and applying different classes of polymers. I have good communications and writing skills. Developed the ability to contribute efficiently as part of a team and can take responsibility independently towards driving projects to completion.

Educational Qualification and Work Experience

(July 2015-April 2022) CSIR-National Chemical Laboratory, Pune: Ph.D. (Chemical Sciences)
Thesis title: Synthesis of various classes of chiral polymers and their application in enantioselective separation. (**Supervisor:** Dr. Asha SK)
(2011-2013) SGB Amravati University: M.Sc. (Chemistry) % marks 72
(2008-2011) Shri. Shivaji College, Akola: B.Sc. % marks 71.5
(2001-2008) Jawahar Navodaya Vidyalaya Washim (Secondary and Higher Secondary Schooling)

- Qualified National Eligibility Test for Ph.D. CSIR-NET AIR: 51 (June 2014)
- Qualified Graduate Aptitude Test in Engineering (GATE) AIR:1247 (January 2014)
- **July 2015-April 2022: CSIR-NCL, Pune, India (Research fellow and Research associate)** (Advisor: Dr. Asha S. K.)
- **(July 2014–May 2015) Kanifnath Science College, Karanja, India**
  (Chemistry teacher for 11th, 12th class, and B. Sc.)

Summary of Research experience

- **Multistep organic synthesis**

Multistep synthesis of L and D-Amino acid-based functionalized fluorene, thiophene, and styrene monomers. Purification and structural characterization of these monomers by ^{1}H, ^{13}C NMR, FT- IR, MALDI TOF, and HRMS. Multi-step organic synthesis methodology includes reactions like electrophilic substitution, DCC DMAP coupling, etherification, esterification, bromination, copper-catalyzed click reactions, Friedel Craft acylation, etc., for the synthesis of functional monomers.

- **Polymerizations**

Expertise in designing, developing, and synthesizing functionalized π-conjugated polymers by metal-catalyzed cross-coupling polymerizations methods like Suzuki, Stille, and Direct heteroarylation polymerization (DHAP). Experience in bulk polymerization (solvent-free), emulsion polymerization of polystyrene, and functionalized polystyrene by free radical polymerization, RAFT, and condensation polymerization.

- **Post Polymer modification**

Post polymer modifications like deprotection of functionality (phthaloyl protection Boc. protection or ester) further improve the desired property in polymer-like water solubility, selectivity, sensitivity, or change in morphology. The desired properties like chirality can be introduced in polymer by post polymer modification of achiral polymers with chiral functionality.

- **Polymeric microspheres**

Experience in preparing uniform size polymeric microspheres with a high surface area from chiral and achiral polystyrenes using solvent emulsion technique. Such polymers have application in chiral separation, targeted drug delivery, control released of cosmetics, and agrochemical.

- **Polymer characterizations**

Hands-on experience in using several techniques used for the characterization of polymers. Structural characterization of polymers by 1D and 2D NMR spectroscopy, FTIR, and elemental analysis. The molecular weight determination of polymers using gel permeation chromatography using a triple detector (UV, RI, and light scattering), ^{1}H NMR, and MALDI-TOF. Morphological characterization of polymers using FE-SEM, HR-TEM, profilometer, and AFM. Polymer solution aggregated or microspheres characterization by dynamic light scattering (DLS) and surface charge by zeta potential setup. Self-assembly and chirality in polymers determined using CD spectroscopy.

- **Photophysical Characterizations**

Hands-on experience in handling instruments like steady-state and temperature-dependent UV-visible spectrophotometers to characterize liquid, solid powder, and film samples. Application of fluorescence spectrophotometer to determine photoluminescence, excitation, quantum yield calculations, and the fluorescence lifetime measurements of organic, inorganic, liquids, solids, and films samples. Basic understanding of these instruments and data interpretation to study FRET pair quenching, colour tuning, aggregation induce emission, etc., can be used in fluorescence sensing or live-cell imaging.

- **Thermal Characterizations**

Experience in using thermal characterization instruments like TGA to determine degradation temperature, thermal stability, and degradation profile of polymers, small molecules, and organic-inorganic composite. DSC to determine the critical parameters like TG, TM, and TC of polymers and small molecules.

- **Instrument handling**

Gel Permeation Chromatography (high and room temp), UV-Vis spectrophotometer, Fluorescence spectrophotometer (photoluminescence, Quantum yield, lifetime), FTIR, Thermogravimetric Analysis (TGA), Differential Scanning Colorimetry (DSC), Dynamic Light Scattering (DLS), Zeta potential and CD spectrometer. Experience in sample preparation and morphology interpretation of Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), MALDI-TOF, and HRMS.

- **Other Techniques**

Sound knowledge of ring-opening polymerization (ROP), melt condensation polymerization, and material development for 3D printing application using DIW (Hands-on experience), DLP, FDM, and SLS 3D printer. Experience in a team-oriented work environment and collaboration.

Technical Skills

- Instrument operation and technical understanding of 3D Printer (DIW).
- Familiar with MS Office package including MS Word, PowerPoint, Excel, Chemdraw, Origin, ACD NMR processor, Good knowledge in database searching like Chemical Abstracts, SciFinder, Web of Science.
- Served as a departmental safety coordinator with hands-on training in handling fire extinguishers and maintaining waste solvent disposal records.
- Involved in procurement of chemicals and instruments for R&D purposes in the laboratory.
- Involved in social activities in NCL and work as president or chemical society in college

Awards and Fellowships

- **Best Poster Award**- Presented in “Humbodlt kolleg on innovation and entrepreneurship: role of science and technology” (Humboldt Kolleg) at Kashid, Maharashtra, India **2019.**
- **Best Oral Presentation**- Presented in “NCL-RF annual students’ conference” CSIR-NCL, Pune, India **2018.**
- **Best Poster Award (NCL-RF Agnimitra memorial poster award)** Presented in “National science day at CSIR-NCL, Pune, India **2019.**
- **Research Fellowship:** Awarded by Council of Scientific and Industrial Research (CSIR) Govt. of India

List of Publications

- **Shrikant B. Nikam,** Asha SK, Enantioselective Separation Using Chiral Amino Acid Functionalized Polyfluorene Coated on Mesoporous Anodic Aluminum Oxide Membranes. *Anal. Chem.* **2020**, 92, 10, 6850–6857. https://doi.org/10.1021/acs.analchem.9b04699
- **Shrikant B. Nikam,** and Asha SK. Enantioselective separation of amino acids using chiral polystyrene microspheres synthesized by post polymer modification approach. *ACS Polym. Au* **2022**, 2, 4, 257–265 https://doi.org/10.1021/acspolymersau.2c00004 (Invited Article)
- **Shrikant B. Nikam,** Chandrodai Pratap Singh, Sailaja Krishnamurty and Asha S.K. Structure-property insights into chiral thiophene copolymers by direct heteroarylation polymerization. *European Polymer Journal* **2022**, 181, 111676-111685 https://doi.org/10.1016/j.eurpolymj.2022.111676 (Invited Article)
- T Senthilkumar, N Parekh, **Shrikant B. Nikam**, SK Asha, Orientation effect induced selective chelation of Fe 2+ to a glutamic acid appended conjugated polymer for sensing and live-cell imaging *J. Mater. Chem. B*, **2016**, 4, 299-308. https://doi.org/10.1039/C5TB02293B
- B. P. Mali, S. R. Dash, **Shrikant B. Nikam**, A. Puthuvakkal, K. Vanka, K. Manoj and R. G. Gonnade. Five concomitant polymorphs of a green fluorescent protein chromophore (GFPc) analogue: understanding variations in photoluminescence with p-stacking interactions. *Acta Cryst. B* **2020,** 76, 1-15. https://doi.org/10.1107/S2052520620010343

Conferences Attended/Oral/Poster Presentations

- **Shrikant B. Nikam,** T. Senthilkumar, Nimisha Parekh, and Asha SK. Glutamic Acid Appended Water-Soluble Conjugated Polymer for Fluorescence Sensing and Imaging of Fe^{2+} ions in Live Cells. **MACRO 2017** International Conference on Polymers Science and Technology Thiruvananthapuram. **(Poster Presentation)**
- **Shrikant B. Nikam,** Asha SK. Chiral Amino acid Functionalized Polyfluorenes Supported on Mesoporous Anodisc Aluminium Oxide (AAO) Membranes for Enantioselective Separation. **MACRO 2018** International Conference on Polymers Science and Technology IISER Pune. **(Oral Presentation)**
- **Shrikant B.** Nikam, Asha SK. Effect of Different Pore-Sized Anodisc Aluminium Oxide Membranes (AAO) on Enantioselective Separation. **(Humboldt Kolleg)** "Humboldt kolleg on innovation and entrepreneurship: role of science and technology" at Kashid, Maharashtra, India. **(Best poster award)**
- International Conference on Fluorescence and Raman Spectroscopy **(FCS) at** IIT Guwahati 2017.