



Smriti Thakur

Chemical Sciences (Ph.D)

Skills

Knowledge of software systems: Matlab, Chemdraw, Mestrenova, SpinWorks, and Origin 5+ yrs.

Data Analysis 5+ yrs.

Analytical thinker with interpersonal skills

Problem Solving and Critical Thinking

Strong written and verbal communication

Perseverance and motivation

Teamwork

Attention to Detail

English

Hindi

Biography

5 years of experience in semiconductor materials' synthesis along with experience in photoresist materials, nanoscale patterning and optimization of the lithography process. Expertise includes organic and inorganic synthesis with additional Schlenk line experience utilizing various spectroscopies and softwares. Seeking an entry-level position within an organization to utilize my previous work experience and skill set to contribute to the growth and reputation of the organization.

Work Experience

Senior Project Scientist| Post-Doctoral Fellow

2020 - 2021

Department of Chemistry (Prof. Subrata Ghosh)
IIT Mandi

Project Title: Development of Indigeneous Photoresist Technology for Semiconductor Industries

- Developed and optimized wafer fabrication processes (thin films deposition, photolithography, coat, exposure, develop, etch etc.) to meet various optical and photonics project requirements.
- Improved resist material and lithography process to better enable a successful pattern transfer
- Worked in photoresist materials synthesis, characterization and deposition.
- Performed DUV exposures and SEM analysis to meet internal characterization objectives.
- Studied the interaction between different process steps and films and their impact on the patterning performance.
- Sustained cleanroom-based physical and chemical characterization procedures.
- Documented and communicated plans, status and results of projects in written reports and presentations, including the analysis and interpretation of data.

Research Scholar | PhD Student

2015 - 2019

Department of Chemistry (Prof. Sanjay K. Mandal)
IISER Mohali

Thesis Title: Morphology Engineering and Photocatalytic Activity of ZnO and CdS Nanostructures Derived from Coordination Polymers as Precursors

- Worked in inorganic nanoparticles synthesis, sol-gel chemistries, organometallic complexes, molecular metal oxides, metal-oxide nanoparticles, metal-organic frameworks (MOFs).
- Performed moderately complex to the complex synthesis of nanomaterials using combinations of solution-based crystallization and hydrothermal synthesis for photocatalysis and microbial studies on *E. Coli*.
- Attained experience in solid-state semiconductor nanostructures (relevant to photochemistry) synthesis and post-modification
- Worked in the rational design of photocatalysts, new photocatalytic methodologies, and industrial implementation of photocatalytic transformations.
- Studied the influence of a variety of process parameters on the growth of the resulting nanostructures; conduct structural characterization (SEM, XRD, TEM, Raman) of the samples, in order to assess the crystalline quality, their length, diameter, type of defects, particle size, and distribution.
- Performed moderately complex to the complex synthesis of nanomaterials using combinations of solution-based crystallization and hydrothermal synthesis for photocatalysis and microbial studies on *E. Coli*
- Attained experience in designing and performing design of experiments.
- Contributed to research publications and reports as evidenced by peer-reviewed (or equivalent) publications.
- Worked to complete complex tasks in creative, efficient, and effective ways with little supervision.
- Contributed as an effective team member, presented informal progress reports to mentors and the research team on a regular basis.

Education

2015-2019

Ph.D in Chemical Sciences
IISER Mohali

2013-2015

MS in Chemical Sciences
IISER Mohali

2012-2013

B.Ed. in Science
Kurukshetra University

2009-2012

B.Sc. (Hons.) in Chemistry
University of Delhi

Interests

- ▶ Piano
- ▶ Dancing
- ▶ Solving Puzzles
- ▶ Reading mystery novels
- ▶ Badminton

Contact

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References

Available on Request

Publications

- **Smriti Thakur**, Prasenjit Das, Sanjay K. Mandal "Solvent-Induced Diversification of CdS Nanostructures for Photocatalytic Degradation of Methylene Blue". In: *ACS Appl. Nano Mater.*, 2020, **3**, 5645-5655. <http://dx.doi.org/10.1021/acsnm.0c00868>.
- **Smriti Thakur**, Sanjay K. Mandal "Morphology Engineering of ZnO Nanorod arrays to Hierarchical Nanoflowers for Enhanced Photocatalytic Activity and Antibacterial Action against *E. coli*", In: *New J. Chem.*, 2020, **44**, 11796-11807. <http://dx.doi.org/10.1039/D0NJ01661F>.
- **Smriti Thakur**, Sanjay K. Mandal "Effect of Dilution in Hydrothermal Process and Post-Synthetic Annealing on the Tailoring of Hierarchical ZnO Nanostructures", *Cryst Engg Comm*, 2020, **22**, 3059-3069. <http://dx.doi.org/10.1039/D0CE00310G>.
- **Smriti Thakur**, Sanjay K. Mandal "Investigating the Formation of Diverse ZnO Nanostructures Based on Solvent, Temperature, and pH as Adjustable Parameters", *Mater. Adv.*, 2021, **2**, 511-524. <https://doi.org/10.1039/D0MA00781A>.
- **Smriti Thakur**, Rupinder Kaur and Sanjay K. Mandal "Size Dependence of CdS Nanoparticles on the Precursor Concentration and Visible Light Driven Photocatalytic Degradation of Methylene Blue", *New J. Chem.*, 2021, **45**, 12227-12235. <https://doi.org/10.1039/D1NJ01588E>.
- **Smriti Thakur**, Sanjay K. Mandal "Precursor and Time- Morphological Evolution of ZnO Nanostructures for Comparative Photocatalytic Activity and Adsorption Dynamics with Methylene Blue Dye", *ACS Omega*, 2020, **5**, 16670-16680. <https://doi.org/10.1021/acsomega.0c01555>.
- Sadhika Khullar, **Smriti Thakur**, Sanjay K. Mandal "Synthesis and Structural Characterization of Metal Ion Directed Coordination Networks and Their Template-free Fabrication to Metal Oxide Nano-materials", In: *Inorganica Chim. Acta*, **119281**, 2019. <https://doi.org/10.1016/j.ica.2019.119281>.

Instrumentation Skills

Scanning Electron microscopy (SEM)/ EDS, Photo lithography (Deep UV and EBL), Spin coater, Sputtering system, Thin Film Deposition Methods (CVD and PVD), Powder X-ray Diffraction (PXRD), UV-vis Spectrophotometer (UV-vis), Particle Size Analyzer (DLS), Fourier Transform Infrared Spectroscopy (FTIR), Thermogravimetric Analysis (TGA), Spectrofluorometer and Tube Furnace.

Awards and Recognitions

- MHRD Fellowship (2013-2019) - Selected in top 7 candidates in Int-PhD programme all over India
- IIT-Jam (2013) - Top 4 percentile among 6000 students
- Chemistry Quiz Curie Club (2013) - Second Prize in the Department of Chemistry
- CSIR-NET (2015) - Qualified with All India Rank: 30
- PhD Completion (2019) - Ist student of institute to finish PhD in 3.5 years
- SSALDF, IIT Mandi (2019) - Second Prize in the Workshop

Conferences and Workshops

National Workshop on advances in materials, processing and characterization, NIT Raipur (2019), Summer School on Advanced Lithography and Device Fabrication, IIT Mandi (2019), NanoIndia Conference, IIT Delhi (2017), Conference in Nano, INST Mohali (2017), American Chemical Society, (ACS) on Campus, IISER Mohali (2018).