

Sohini Dawn
PhD. IN Chemistry
Texas A & M
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OBJECTIVE:

To strengthen my scientific temperament and hone my practical finesse through hands-on laboratory experience, and to engage with real-world implications in research, with the aim of pushing the boundaries of academia and scholarship.

ACADEMIC DETAILS:

STANDARD	UNIVERSITY	INSTITUTE	YEAR	Score
PhD.	Texas A& M	Texas A& M	2024-PRESENT	GPA :3.24/4
MSc.	IIT BOMBAY	IIT BOMBAY	2022-2024	CPI:8.20/10
BSc.	BANASTHALI	BANASTHALI VIDYAPEETH	2019-2022	CPI: 8.32/10
INTERMEDIATE/+2	WBCHSE	KULTI GIRLS' HIGH SCHOOL	2017-2019	86.6 %
Matriculation	WBBSE	KULTI GIRLS' HIGH SCHOOL	2017	92.4 %

PhD:

Topic: Electrophysiological studies of ion channel function
Supervisor: Dr. Lane Baker
Short Description:
Ion channels are membrane proteins that control the flow of ions across cell membranes. They are central to signaling, excitability, and transport in living cells. My research uses electrophysiological techniques to measure and analyze ion channel activity and to understand how channel function is regulated by its membrane environment and by physical and chemical stimuli. The work combines electrophysiology with complementary biophysical methods, with the aim of improving the molecular understanding of how ion channels work.

MSc. PROJECT:

Topic: Synthesis of Prussian Blue Analogue as a cathode in rechargeable batteries.
Supervisor: Dr. Srinivasan Ramakrishnan
Short Description:
Prussian blue $[Fe_4[Fe(CN)_6]_3.xH_2O]$ is an inorganic complex salt containing Fe^{3+} and Fe^{2+} ions. Modifications of Prussian blue lead to a series of new compounds, Prussian blue analogs $[A_xM_A[M_B(CN)_6]_z.nH_2O]$, distinguished by the rigid open framework and weak interaction with interstitial cations, which render them highly promising as emerging electrode materials for sodium-ion batteries. There are sufficiently large three-dimensional diffusion channels with weak interaction with the diffusing ion to facilitate its inward and outward transport. So I am trying to synthesize a Prussian blue analogue that will show reasonable efficiency.

PROJECTS DURING INTERNSHIP:

Topic – Study of the Variation in Electron Transporting Layer in Perovskite Solar Cell and Fabrication of Solar Device.
Supervisor: Prof. Deepa Khushalani, Material Chemistry Laboratory, Tata Institute of Fundamental Research (TIFR), Mumbai

Short Description:

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Polymers dissolve in tetrahydrofuran to degrade; the degradation process has been studied using water. As the addition of water dilutes the solution, the atoms start the nucleation process. Nucleation is the process of self-organization process that results in the creation of a new thermodynamic phase or structure by keeping the temperature constant and the addition of water leads to the formation of colloid. The change in the size of the particles is observed by **Dynamic Light Scattering (DLS).** Particle size is also confirmed by passing laser light (Tyndall effect).

RESEARCH INTEREST:

- Solar energy conversion
- Application of nanomaterials in drug delivery, detection of diseases
- Battery
- Solid-state chemistry
- Polymer chemistry

SCHOLASTIC ACHIEVEMENT:

- **All India Rank – 125 (Chemistry)** out of **12940** students in the esteemed Joint Admission Test for MSc. (**IIT-JAM**), 2022.
- Completed a women's business creator course (Dream Builder).

LABORATORY SKILLS:

Spectroscopic Methods:
UV-Vis, IR, NMR, Colorimetry, Circular Dichroism Spectroscopy (Monitoring thermal un-folding of protein), and Emission Spectra (Measuring Quantum yield).
Other Instrumental Techniques: Potentiometry, Conductometry, pH-metry, Spin coater, glove box, Dynamic light scattering (DLS).
Characterization Technique: X-ray diffraction, Scanning Electron Microscopy, Transmission Electron Microscopy.

Separation Techniques: Column Chromatography, TLC, Paper Chromatography, Solvent Extraction using a separatory funnel, Fractional Distillation
Titration Methods: Potentiometric, Conductometric, Complexometric, Iodometric and Iodimetry.

TECHNICAL SKILL:

Programming Language: Python
Operating Systems: Microsoft Word, Microsoft PowerPoint, Microsoft Excel, Origin
Software: Gaussian, Chemdraw, HighScore Plus, Mobaxterm, Pymol

KEY COURSES:

Physical Chemistry:
Chemical Thermodynamics and Kinetics, Electrochemistry, Quantum Chemistry, Molecular Spectroscopy, Fluorescence spectroscopy, Statistical Mechanics and Molecular Dynamics, Industrial Chemistry
Inorganic Chemistry:
Chemical bonding, Coordination Chemistry, Organometallic Chemistry, Bio-inorganic Chemistry, Redox Chemistry, Analytical Chemistry.
Organic Chemistry:
Organic reaction mechanism, Stereochemistry, Name Reaction, Pericyclic Reaction, Photochemistry, Spectroscopy (UV-Vis, IR, NMR, EPR), Retrosynthesis.

ENGLISH PROFICIENCY:

TOEFL (iBT): READING: 23/30, SPEAKING: 26/30, WRITING: 22/30, LISTENING:26/30

POSITION OF RESPONSIBILITY:

Subject Matter Expert (Chemistry) at Doubtnut (Online Teaching Platform)