

# Shivani Thakkar, Ph.D.

Experiment Enthusiast, Driven by Insatiable Curiosity, Quick Learner

## PROFILE SUMMARY

Highly motivated PhD-trained chemist with strong expertise in heterogeneous catalysis, analytical chemistry, and materials research. Experienced in Gas Chromatography (GC) and Gas Chromatography Mass Spectrometry (GC-MS) based analysis, catalyst synthesis, surface characterization, and computational chemistry. Proven ability to independently conduct research and manage laboratory instrumentation.

## EDUCATION

### **Birla Institute of Technology and Science Pilani (BITS Pilani), Pilani, Rajasthan**

*Ph.D. in Chemistry* | 2020 – 2025

Thesis: Towards Sustainable Glycerol Carbonate and Epichlorohydrin Synthesis: Catalysis and Computational Studies

Research Supervisor: Dr. Bibhas Ranjan Sarkar, Ph.D., BITS Pilani, Pilani, Rajasthan

### **The Maharaja Sayajirao University of Baroda, Vadodara**

*M.Sc. Chemistry (Inorganic)* | 2017 – 2019 | CGPA: 7.33/10

Dissertation: Synthesis and characterization of dioxouranium(VI) complexes with multidentate ligands

### **The Maharaja Sayajirao University of Baroda, Vadodara**

*B.Sc. Chemistry (Honors)* | 2014 – 2017 | CGPA: 7.73/10

## RESEARCH EXPERIENCE

- Designed and synthesized heterogeneous metal-based catalysts (Zn, Ru to Cd systems)
- Conducted  $CO_2$  – utilization reactions for cyclic carbonate synthesis using biomass-derived substrates
- Performed surface and structural characterization using Brunauer-Emmett-Teller ( $N_2$ –BET), X-ray Photoelectron Microscopy (XPS), Powder X-ray Diffraction (PXRD), Field Emission Scanning Microscopy coupled with Energy Dispersive X-ray Spectroscopy (FESEM-EDS), Ammonia and Carbon Dioxide Temperature Programmed Desorption ( $NH_3$  and  $CO_2$ -TPD), and Thermogravimetric Analysis (TGA)
- Applied Gas Chromatography (GC) and Gas Chromatography Mass Spectrometry (GC-MS) for product identification, yield optimization, and byproduct analysis
- Mechanistic investigation using in-situ Fourier Transform Infrared Spectroscopy (FT-IR)
- Supported experimental findings through DFT-based computational studies using Gaussian 16

## TECHNICAL SKILLS

- GC - Gas Chromatography
- GC-MS - Gas Chromatography Mass Spectrometry
- $N_2$ -BET - Brunauer-Emmett-Teller Surface Area Analysis
- XPS - X-ray Photoelectron Microscopy
- PXRD - Powder X-ray Diffraction
- FT-IR - Fourier Transform Infrared Spectroscopy

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[LinkedIn](#)

## SKILLS

- \* Communication  
★ ★ ★ ★ ★
- \* Analytical Thinking  
★ ★ ★ ★ ★
- \* Problem solving  
★ ★ ★ ★ ★
- \* Independent Research  
★ ★ ★ ★ ★
- \* Laboratory Management  
★ ★ ★ ★ ★
- \* Instrument Coordination  
★ ★ ★ ★ ★
- \* Data Interpretation  
★ ★ ★ ★ ★
- \* Scientific Writing  
★ ★ ★ ★ ★
- \* Team Coordination  
★ ★ ★ ★ ★
- \* Time Management  
★ ★ ★ ★ ★
- \* Attention to Detail  
★ ★ ★ ★ ★
- \* Work Etiquette  
★ ★ ★ ★ ★
- \* Empathy  
★ ★ ★ ★ ★
- \* Creativity  
★ ★ ★ ★ ★
- \* Adaptability  
★ ★ ★ ★ ★
- \* Microsoft Office suite  
★ ★ ★ ★ ★

- **UV-Vis** - Ultraviolet – Visible Spectroscopy
- **TGA** - Thermogravimetric Analysis
- **DSC** - Differential Scanning Calorimetry
- **AAS** - Atomic Absorption Spectroscopy
- **NH<sub>3</sub> and CO<sub>2</sub>-TPD** - Ammonia and Carbon Dioxide Temperature Programmed Desorption
- High-pressure reactors and hydrothermal autoclaves
- Gaussian 16, GaussView, ChemDraw, Origin

## PROFESSIONAL EXPERIENCE

**Birla Institute of Technology and Science, Pilani - Teaching Assistant**  
January 2020 – December 2024

### Nature of job responsibilities were as under:

- Assisted professors during undergraduate and postgraduate chemistry laboratory sessions
- Trained and mentored UG and PG thesis students in experimental research
- Coordinated operation and maintenance of GC and BET instrumentation
- Supported academic administration and laboratory management activities

## PUBLICATIONS

- Zinc Alendronate as Ossified Catalyst for Glycerol Valorization to Glycerol Carbonate Using Urea as CO<sub>2</sub>-Surrogate, *Catalysis Science & Technology*  
DOI: 10.1039/D5CY01218J (*Featured in the 2025 spotlight of Catalysis Science & Technology homepage*)
- Sulfonated ZnO/g-C<sub>3</sub>N<sub>4</sub> catalyst for glycerol valorization (Under Communication)
- Computational studies on catalytic conversion of glycerol to epichlorohydrin (Under Communication)

## CONFERENCES

- Advances in Chemistry for Energy and Environment (CACEE), TIFR Mumbai | 2024
- **ACS Fall 2024, Elevating Chemistry, Denver, CO, USA (On site) | 2024**
- Chemical Research Society of India (CRSI) NSC-32 & 17th CRSI-RSC, BITS Pilani, Rajasthan | 2024
- International Conference in Modern Trends in Inorganic Chemistry XX (MTIC-XX), IISc Bangalore | 2023
- 1<sup>st</sup> IEEE-NTC International Conference on Emerging Materials for Sustainable Development, AcSIR-CSIO, Chandigarh | 2022

## CERTIFICATIONS / COURSES

- AI Assisted Manuscript Writing | 2024
- Analytical Advances under DST-STUTI Program | 2022
- Supporting Chemistry Research with Modern DFT | 2021

## DECLARATION

I hereby declare that all the facts given above are true and correct to the best of my knowledge.

**SHIVANI THAKKAR, Ph.D.**

## ACADEMIC

### ACHIEVEMENTS

- **Gujarat State Eligibility Test for Assistant Professor (GSET) | 2019**
- **Joint Admission test for Masters (JAM) | 2017**

### PROFESSIONAL AWARDS

- **IIT Kharagpur Event – Ecell 2k18-19 | 2019**
- **Minaxi-Lalit Science Award – (Gujarat Science Academy) | 2017**

### EXTRACURRICULAR ACHIEVEMENTS

**Gold Medal** in Volleyball (Girl's Team) – BITS Open Sports Meet 2024, Chemical Society (MSU) 2018 – 2019, in Tug of War – Youth Fest (MSU) 2018

**Bronze Medal** in Volleyball (Girl's Team) – BITS Open Sports Meet 2024




**Silver Medal** in Cricket Tournament (Women's Day Event 2024), BITS Pilani

**Painting Exhibition** – Portrayal 2019, 2018 and 2016, Vadodara

### QUALITIES

- Dedication
- Honesty
- Loyalty
- Curiosity
- Attentive listener

### LANGUAGES

Gujarati – Expert   
Hindi – Expert   
English – Proficient 

### COMMUNITY SERVICES

- Ambassador at NGO, Yuvalay, India | [Website](#) (2015 – present)
- Non profitable volunteer at Maker Fest, Vadodara (2019 – present)
- An active member at Caring and Sharing, Vadodara (2018 – Present)
- An active member of the National Service Scheme (NSS) at BITS Pilani, Rajasthan (During Covid)