

Dr. SIBSANKAR RAHUT

From kolkata

PhD, IIT Kharagpur

Asst Professor

Dept. of Chemical & Food Technology

NIMS University, Jaipur

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Google Scholar Link: <https://scholar.google.co.in/citations?hl=en&user=RkeXzZcAAAAJ>

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Career objective:

Seeking for a faculty/research fellow position so as to ameliorate my technical and professional skills on nanomaterial's energy application in the field of semiconductor physics and optoelectronics, electrocatalysis and photocatalysis, Solar cell, fuel cell and Li ion battery.

Profile Summary:

- Expert in understanding **semiconductor nanomaterials, 2D material** for **electrocatalysis and photocatalysis**.
- Expert in handling **electrocatalyst**, fabrication of electrode and handling of **fuel cell**.
- Expert in handling aqueous phase electro-reduction of CO₂ and synthesizing energy materials.
- Knowledge of both **theoretical density functional theory (DFT) calculation and experimental characterization (XRD, SEM, TEM, FTIR, EPR, PL, AFM, SAXS, XPS, UV-Vis spectroscopy, Auger electron spectroscopy, Raman spectroscopy, Cyclic voltammetry, Linear sweep voltammetry, NMR, Impedance spectroscopy, chronoamperometry and BET analysis)** for nanomaterials as well as **surfactant assisted synthesis to control morphology of nano materials**.
- Knowledge of **Semiconductor optics and electronics, MOFs, perovskite and chalcogenide**.
- Possessing effective communication & interpersonal skills along with a hard working attitude & commitment to delivery and expert in handling of windows operating system and **MS office 2007, Latex & MATLAB**, and expert in handling of **Quantum Espresso, SIESTA, ORCA- an Abinitio simulation package**.
- Expert in **atomic layer deposition** to synthesize catalyst
- Expert in handling **Screen printed electrode** for **NanoBiosensor** application

Academic Qualification:

Degree	College/University	Year
Assistant Prof (Chemical Engg)	NIMS University	June'23 - Present
Postdoctoral fellow/ Research Asoc	Indian Institute of Technology Kharagpur	2022-2023
Post Doctoral Research Associate	Lehigh University, USA	2019-2021
Institute Postdoc fellow	Indian Institute of Technology, Kanpur	2019
PhD (Chemical Engg)	Indian Institute of Technology Kharagpur	2019
M.Tech (Chemical Engg)(78.5%)	Indian Institute of Technology (BHU)	2013
B.Tech (Chemical Engg)(73.8%)	Haldia institute of technology, Haldia	2010

Supervision Experience:

- Project Supervisor to Final Year graduate Students of chemical engineering: IIT Kharagpur, 2014-2019
- Laboratory Demonstrator to Undergraduate Students of chemical engineering, IIT Kharagpur, 2014-2019

Subject of Teaching Interest: Thermodynamics, Chemical Reactor Analysis

Industrial Project:

Summer Project at "Exide Industries Ltd" Haldia (West Bengal)

- Mass balance of residual lead in Battery
- Analysis of net water in paste mix in Battery

Research Experience:

Indian Institute of Technology (BHU), Varanasi, India

Graduate Researcher:

Electro-oxidation study of aliphatic alcohols in Y-shaped laminar flow-based membrane less fuel cells
Study on the effect of various process parameters in microfluidic fuel cell.

Indian Institute of Technology, Kharagpur, India

Doctoral Research:

Fabrication of Transition Metal Based Nanomaterials for Visible Light Photocatalysis and Electrocatalytic Oxygen Evolution

Indian Institute of Technology, Kanpur, India

Institute postdoc fellow

(May 14, 2019 – June 20, 2019)

Lehigh University, Bethlehem, PA, USA

Post-Doctoral Research:

(August 2019-July 2021)

Aqueous phase electro-catalytic reduction of CO₂ with surface oxygen vacancy assisted SnO₂

Indian Institute of Technology, Kharagpur, India

DST Postdoctoral Research Associate

(December 2021 – May 2022)

Fabrication of Wash free Electrochemical nano-biosensor

Indian Institute of Technology, Kharagpur, India

GIAN Research Associate

(May 2022 – May 2023)

Photochemical and electrochemical CO₂ reduction and C-C coupling

NIMS University (Rajasthan), India

Assistant Prof in Chemical Engg

International Journal Publication:

1. Ramdayal Panda, **Sibsankar Rahut**, Jayanta Kumar Basu, Preparation of a Fe₂O₃/MIL-53 (Fe) composite by partial thermal decomposition of MIL-53 (Fe) nanorods and their photocatalytic activity, **RSC Advances**, 2016, 6, 80981-80985. **(Royal Society of Chemistry, IF-4.0)**
2. **Sibsankar Rahut**, Ramdayal Panda, Jayanta Kumar Basu, Solvothermal synthesis of a layered titanate nanosheets and its photocatalytic activity: Effect of Ag doping, **Journal of Photochemistry and Photobiology A: Chemistry**, 2017, 341, 12-19. **(Elsevier, IF-5.1)**
3. **Sibsankar Rahut**, Awinash Bharti, Jayanta Kumar Basu, Optical and electronic configuration of a novel semiconductor-silver nitroprusside for enhanced electrocatalytic and photocatalytic performance, **Catalysis Science & Technology**, 2017, 7, 6092-6100. **(Royal Society of Chemistry, IF-6.1)**
4. **Sibsankar Rahut**, Sovan Kumar Patra, Jayanta Kumar Basu, Surfactant assisted self assembly of novel ultrathin Cu[Fe(CN)₅NO] nanosheets for enhanced electrocatalytic oxygen evolution: Effect of nanosheet thickness. **Electrochimica Acta**, 2018, 265, 202-208. **(Elsevier, IF-7.3)**
5. Sovan Kumar Patra, **Sibsankar Rahut**, Jayanta Kumar Basu, Enhanced Z-scheme photocatalytic activity of a π -conjugated heterojunction: MIL-53 (Fe)/Ag/gC₃N₄, **New Journal of Chemistry**, 2018, 42, 18598-18607. **(Royal Society of Chemistry, IF-3.28)**
6. **Sibsankar Rahut**, Soumya Shankar Basu, Jayanta Kumar Basu, Surfactant assisted self-assembly of Ag⁺ containing nanocrystals and their facet dependent photocatalytic activity. **CrystEngComm**, 2019, 21, 23-29. **(Royal Society of Chemistry, IF-3.3)**
7. **Sibsankar Rahut**, Soumya Shankar Basu, Jayanta Kumar Basu, Electron trapping protocol of FePW₁₂O₄₀ microflowers with dual catalytic Properties: Visible light photodegradation of amphetamine and electrocatalytic oxygen evolution, **Chemical Communication**, 2019, **55**, 4825-4828. **(Royal Society of Chemistry, IF-6.0)**
8. Soumya Shankar Basu, **Sibsankar Rahut**, Charishma Chinthala and Jayanta Kumar Basu, Tuning of morphological and electronic properties of In₂S₃ nanosheets by cerium ion intercalation for optimizing

photocatalytic activity, **CrystEngComm**, 2020, 10.1039/D0CE00674B (**Royal Society of Chemistry, IF-3.3**)

9. R Manna, **S Rahut**, AN Samanta Synergistic effect of Zn₂GeO₄ nanorod decorated metal organic framework ZIF-67 and its metal ligand charge transfer effect towards the photocatalytic CO₂ reduction and C–C coupling, **Materials Today Energy**, 2023 35, 101326 (**Elsevier, IF-9.3**)
10. SS Basu, **S Rahut**, AS Bisht, JK Basu, Surfactant-assisted tuning of K₂V₃O₈ nanorods for robust charge dynamics in semiconductor photocatalysis, **Materials Science in Semiconductor Processing** 147, 106681 (**Elsevier, IF-4.1**)
11. SS Basu, S Rahut, C Chinthala, AS Bisht, JK Basu, Solvent-assisted synthesis of CoC₂O₄ nanorods for enhanced charge transfer in dual catalytic activity: Photocatalysis and electrocatalytic oxygen evolution, **Materials Chemistry and Physics** 282, 125948 (**Elsevier, IF-4.6**)

International conference Attended:

Oral Presentation:

- Presented research work on “Studies of process parameter of a NaBH₄ based Microfluidic Fuel Cell” in 65th Annual session of **IICChE, Chemcon 2012, Jalandhar, India**.
- Presented research work in international conference **ICMAT 2017** on “Solvothermal synthesis of titanate nanosheet: effect of Ag doping” in **Singapore**.
- Presented research work on “Facile development of novel ferric phosphotungstate microflowers with optimum optoelectronic properties for clean energy catalysis: Photocatalysis and electrocatalytic oxygen evolution **American Chemical Society SciMeetings, USA**

Poster Presentation:

- Presented research work in international conference **ISCRE 25** on “Photodegradation Kinetics of Chloramphenicol in Silver nitroprusside suspension” in **Italy**.

Committee Leadership:

- Played in the college cricket tournament, college table tennis championship.
- Worked as a volunteer in the school and college event.
- **General secretary** in JCB hall of residence for 1 year.
- **Life associate member** of Indian Institute of chemical engineers (**IICHE membership no. LAM-64731**)

Referees:

Character Referee 1:

Name: Prof. Jayanta Kumar Basu

Contact: +91-3222-283914

Email id: jkb@che.iitkgp.ernet.in

Connection: **PhD Supervisor**

Character Referee 2:

Name: Dr. Sonali Sengupta

Contact: +91-3222-283954

Email id/: sonalis@che.iitkgp.ernet.in

Connection: **Member of my doctoral scrutiny**

Character Referee 3:

Name: Prof. Bhim Charan Meikap

Contact: +91-3222-283958

Email id/: bcmeikap@che.iitkgp.ac.in

Connection: **Member of my doctoral scrutiny**

Character Referee 4:

Name: Dr. Srinivasa Rangarajan

Email: srr516@lehigh.edu

Phone Number: (610) 758-4219

Connection: **Postdoc Supervisor**