



Dr. Sumanta Kumar Padhi Professor

Department of Chemistry and Chemical Biology
IIT(ISM) Dhanbad, Jharkhand – 826004, INDIA

Curriculum Vitae



Academic Positions Held

- Professor, IIT (ISM) Dhanbad (*Apr 2026 – Present*)
- Associate Professor, IIT (ISM) Dhanbad (*Apr 2021 – Apr 2026*)
- Assistant Professor (PB4), IIT (ISM) Dhanbad (*Jul 2016 – Apr 2021*)
- Assistant Professor (Grade I), IIT (ISM) Dhanbad (*Jul 2013 – Jul 2016*)
- Professor for Special Appointment, Center for Biomimetic Systems, Ewha Womans University, South Korea (*Apr 2013 – Jun 2013*)
- World Class University Program Postdoctoral Fellow, Ewha Womans University, South Korea (*Apr 2012 – March 2013*)
- MEXT Postdoctoral Fellow, Institute for Molecular Science, Japan (*Dec 2008 – Mar 2012*)

Overseas Visiting Professorships

- Visiting Professor, Kyushu University, Japan (*JST LOTUS Program*) *Jun–Jul 2026*
- Visiting Professor, Lund University, Sweden (*STINT Mobility*) *May–Jun 2026*
- Visiting Professor, Lund University, Sweden (*STINT Mobility*) *May–Jun 2025*
- Visiting Professor, Lund University, Sweden (*STINT India Initiation*) *Jun 2024*
- Visiting Professor, Ewha Womans University, South Korea *Dec 2023*
- Visiting Professor, Lund University, Sweden (*STINT India Initiation*) *May–Jun 2023*

Fellowships and Awards

- World Class University (WCU) Program Fellowship, South Korea (*2012–2013*)
- MEXT Postdoctoral Fellow, Japan (*2008–2012*)
- Dr. Radhanath Rath Memorial Scholarships (*1999–2001, 2002–2003*)
- National Merit Scholarship (*2002*)

Professional Memberships

International Memberships

- Japan Society of Coordination Chemistry (JSCC), Japan — Member, 2009–Present
- American Chemical Society (ACS), USA — Member, 2017–Present

Indian Memberships

- Indian Society for ElectroAnalytical Chemistry (ISEAC) — Life Member, 2026–Present
- Chemical Research Society of India (CRSI) — Life Member, 2020–Present
- Odisha Chemical Society (OCS) — Patron Member, 2018–Present
- Indian Council of Chemists (ICC) — Life Member, 2014–Present

Editorial Roles

- **Royal Society of Chemistry (RSC):** Guest Editor for the RSC Themed Collection entitled “*Centenary of IIT (ISM): Innovative Molecular, Catalytic and Polymeric Materials for a Sustainable Future.*” The collection brings together research contributions highlighting innovative advances in molecular chemistry, catalysis, polymeric materials, sustainable energy, and materials chemistry, and is being published across the following RSC journals:
 - *Green Chemistry*
 - *Dalton Transactions*
 - *Physical Chemistry Chemical Physics (PCCP)*
 - *Catalysis Science & Technology*
 - *Organic & Biomolecular Chemistry*
 - *Sustainable Energy & Fuels*
 - *Journal of Materials Chemistry C*
- **Wiley-VCH:** Guest Editor for a Special Issue commemorating the *100-year celebration of IIT (ISM) Dhanbad*, highlighting contemporary research and emerging scientific contributions associated with the institute’s centenary. The Special Issue is being published across:
 - *Chemistry–An Asian Journal*
 - *physica status solidi (RRL)–Rapid Research Letters (pss RRL)*
 - *Annalen der Physik (AdP)*

Administrative Roles

Institute Level

- Professor-in-Charge, Central Library, IIT (ISM) Dhanbad *Jul 2026–Present*
- Head, Department of Chemistry and Chemical Biology *Jan 2026–Jun 2026*
- Alumni Coordinator, Department of Chemistry and Chemical Biology *Jun 2024–Jan 2026*
- Warden, JASPER Hostel *Jul 2020–Jul 2022*
- Member, Dean's Advisory Council (Academic) *2019–2020*
- Member, International Relations and Alumni Affairs (IRAA) *2014–2018*
- Member, Training and Placement Cell *2016–2017*
- Faculty Coordinator, CONCETTO *2014–2017*

Department Level

- Chairman, Department Faculty Selection Committee (DFSC), Department of Chemistry and Chemical Biology *Jan 2026–Jun 2026*
- Member, Department Faculty Selection Committee (DFSC), Department of Chemistry and Chemical Biology *Nov 2024–Present*
- Coordinator, BS–MS Programme, Department of Chemistry and Chemical Biology *Jun 2024–Present*
- Training and Placement In-charge, Department of Chemistry *2017–Present*
- Convenor, IIT (ISM) Chemical Society *2015–Present*
- Member, Department Undergraduate Committee (DUGC), Department of Chemistry and Chemical Biology *Oct 2022–Oct 2024*
- Convenor and Chairman, Moderation Board for Postgraduate Programmes, Department of Chemistry *2016–2018*
- Coordinator and Member, Board of Courses and Studies, Department of Chemistry *2015*
- M.Sc. Course Coordinator, Department of Chemistry *2014–2017*
- Seminar In-charge, Department of Chemistry *2014–2017*

Research Expertise

Inorganic Chemistry: CO₂ reduction, HCOOH dehydrogenation, NH₃BH₃ dehydrogenation, NH₃ oxidation, Proton reduction, Water oxidation, Electrochemical organic transformations.

Ph.D. Students Awarded (08)

Sl.	Name	Thesis Title	Year	Role	Current Position
1	Jully Patel	Ru(II)-Polypyridyl Water Oxidation	2017	Guide	Asst Prof, Lebanon Valley College, USA
2	Karunamay Majee	Proton Reduction by 1st-row Metals	2018	Guide	Asst Prof, Galgotias Univ, India
3	Ejaz Ahmad	mer-[M(Tpy) ₂] ²⁺ Proton Reduction	2020	Guide	Asst Prof, JP Univ, India
4	Surabhi Rai	Co & Cu Proton/Water Reduction	2020	Guide	Postdoc, UC Davis, USA
5	Aditi Vatsa	Water Oxidation & Formic Acid Dehydrogenation	2021	Guide	R&D Chemist, SAM ENVIRO
6	Manaswini Raj	Co, Cu, Mn Catalysts for Proton Reduction	2022	Guide	Asst Prof, Presidency Univ
7	Aman Mishra	CO ₂ Hydrogenation & HCOOH Dehydrogenation	2024	Guide	Postdoc, Lund Univ, Sweden
8	Sk Samim Akhter	Electro-catalytic CO ₂ Reduction	2024	Guide	Postdoc, Kumoh National Institute, Korea

M.Phil. Student Awarded

Mr. Sunil Kumar, 2014, "Mimicking of NAD⁺/NADH Model Function in Transition Metal Complexes"

Postgraduate Students Supervised: 37

Outreach Programmes

- Coordinator, RAMSE-2025 International Symposium, RAMSE-2018 National Conference, IIT(ISM) Chemistry Society,
- X-ray Crystallography and Electrochemical Workshops for UG/PG students
- International Travel Grants, Invited Seminar Coordination
- Departmental Science Awareness Programmes, and Guest Lectures.

Key Invited Lectures Abroad (Selected)

- Molecular Approaches to Selective CO₂-to-CO Electrocatalysis, Kyushu University, Japan, 22 July 2026.
- Selective CO₂-to-CO Conversion with Earth-Abundant Molecular Catalysts, ICR Kyoto–IRCELS Seminar, Kyoto University, Japan, 15 July 2026.
- Earth-Abundant Cobalt and Copper Molecular Catalysts for CO₂-to-CO Electrocatalysis, University of Paris-Saclay, France, 9 June 2026.
- Proton vs. CO₂ Selectivity in Cu(II) and Co(II) Electroreduction, Lund University, Sweden, 2025
- Cu(II)-Driven CO₂ Electroreduction and Proton Competition, University of Copenhagen, Denmark, 2025
- Homogeneous Catalysts for HCOOH and CO₂ Activation, University of Southern Denmark, Odense, Denmark, 2024
- Molecular Catalysis for Energy via Small Molecule Activation, Ewha Womans University, Seoul, South Korea, 2023
- Half-Sandwich and Sandwich Type Molecular Catalysts: Design and Mechanism, Lund University, Sweden, 2023
- Electro- and Photo-Catalytic H₂ Evolution by Polypyridyl Copper Complexes, MTIC XVIII, IIT Guwahati, India, 2019
- Plenary: Electro-Catalytic H₂ Evolution by Polypyridyl Copper Complex, ICPRS, St. Petersburg, Russia, 2019
- Catalytic Proton Reduction via Pendant Base Effects, 67th JSCC, Hokkaido University, Japan, 2017
- Electro- and Photo-Catalytic Proton Reduction by a μ -Pyridine Bridged Copper Complex, AMEEA 2018, 12–14th December 2018, NIT Rourkela, India.
- Proton-Induced Dynamic Equilibrium between Cyclometalated Ru(II) and rNHC Ru(IV) Tautomers with NAD⁺/NADH Function, 61st CCCO, Okayama University of Science, Japan, 2011.
- Redox Behavior of a Cyclometalated Ru(II) Complex Having NAD⁺/NADH Model Analogue, 60th CCCO, Osaka, Japan, 27–30th September 2010.

R&D Projects (Ongoing and Completed)

- JST-LOTUS-ASPIRE: Green H₂ via NH₃BH₃ dehydrogenation, Japan, 2027–2029
- JST-LOTUS: Green H₂ via NH₃ oxidation, Japan, 2026–2027
- STINT-India Initiation Grant: Electrocatalytic/Photoelectrocatalytic proton & CO₂ reduction, Sweden, 2024–2027
- STINT-India Initiation Grant: Electrocatalytic proton & CO₂ reduction, Sweden, 2023–2024
- CSIR EMR: Molecular catalysts for CO₂ reduction, water oxidation/reduction, 2021–2024
- DST-SERB EMR: H₂ evolution via 1st-row metal complexes, 2017–2020
- TEQIP III: BPI metal complexes for proton reduction, 2018–2020
- DST-SERB: Water splitting by Ru-polypyridyl complexes, 2014–2017
- NAD⁺/NADH model ligand-metal complexes, IIT(ISM) Dhanbad, 2013–2016

Selected Publications & Patents

Journal Cover Articles (Selected)

1. Padhi, S. K.* et al., **Inside Front Cover**, Dalton Trans., 2026, 55, 13008.
2. Padhi, S. K.* et al., **Back Cover**, Dalton Trans., 2026, 55, 7415–7416.
3. Padhi, S. K.* et al., **Inside Back Cover**, Chem. Commun., 2026, 62, 5991–5991.
4. Padhi, S. K.* et al., **Back Cover**, Dalton Trans., 2025, 54, 16993–16994.
5. Padhi, S. K.* et al., **Inside Back Cover**, Catal. Sci. Technol., 2025, 15, 7251.
6. Padhi, S. K.* et al., **Inside Back Cover**, Dalton Trans., 2025, 54, 14227–14227.
7. Mishra, A. et al., **Front Cover**, Eur. J. Inorg. Chem., 2025, 28(21), e70000.
8. Akhter, S. Sk. et al., **Cover Feature**, Chem. Eur. J., 2024, 30, e202403321.

Selected Publications from IIT(ISM) Dhanbad

1. Padhi, S. K.* et al., Dalton Trans., 2026, 55, 13044–13056. (**Inside Front Cover**)
2. Padhi, S. K.* et al., Chem. Commun., 2026, 62, 5880–5884. (**Inside Back Cover**)
3. Padhi, S. K.* et al., Dalton Trans., 2026, 55, 7111–7126. (**Back Cover**)
4. Padhi, S. K.* et al., Dalton Trans., 2025, 54, 16682–16696. (**Back Cover & HOT Article**)
5. Padhi, S. K.* et al., Catal. Sci. Technol., 2025, 15, 7043–7058. (**Inside Back Cover**)
6. Padhi, S. K.* et al., Dalton Trans., 2025, 54, 13894–13908. (**HOT Article & Inside Back Cover**)
7. Padhi, S. K.* et al., Dalton Trans., 2025, 54, 14227–14227. (**Inside Back Cover**)
8. Padhi, S. K.* et al., Dalton Trans., 2025, 54, 16993–16994. (**Back Cover**)
9. Padhi, S. K.* et al., Eur. J. Inorg. Chem., 2025, 28(21), e202500138. (**Front Cover**)
10. Padhi, S. K.* et al., Chem. Eur. J., 2024, 30, e202487004. (**Cover Feature**)
11. Padhi, S. K.* et al., Dalton Trans., 2024, 53, 1209–1220.
12. Padhi, S. K.* et al., Dalton Trans., 2023, 52, 17797–17809.
13. Padhi, S. K.* et al., Inorg. Chem., 2023, 62, 10993–11008.
14. Padhi, S. K.* et al., Inorg. Chem., 2020, 59, 7810–7821.
15. Padhi, S. K.* et al., Electrochim. Acta, 2020, 364, 137277.
16. Padhi, S. K.* et al., Electrochim. Acta, 2020, 354, 136614.
17. Padhi, S. K.* et al., Electrochim. Acta, 2020, 340, 136000.
18. Padhi, S. K.* et al., Dalton Trans., 2017, 46, 14869–14879.
19. Padhi, S. K.* et al., Phys. Chem. Chem. Phys., 2016, 18, 21640–21650.
20. Padhi, S. K.* et al., Dalton Trans., 2015, 44, 920–923.

Patents at IIT(ISM) Dhanbad

1. Roy, T.; Natarajan, M. T.; Jana, S.; Das, P.; Padhi, S. K.* *A Fluoro-Bridged Mixed Valence Dinuclear Copper Complex: Synthesis, Characterization, and Use in Oxidation Reactions*, Indian Patent Application No. 202531111630, 2025. **(GRANTED)**
2. Mishra, A.; Padhi, S. K.* *Hydrogenation of Bicarbonate and CO₂ Captured from Air*, Indian Patent Application No. 202431048509, 2024. **(GRANTED)**
3. Natarajan, T.; Padhi, S. K.* *Catalyst for Green Hydrogen Generation from Ammonia*, Indian Patent Application No. 202431070872, 2024. **(GRANTED)**
4. Tanaka, K.; Padhi, S. K. *Ruthenium complexes, and their use for preparation of reduced compounds of organic compounds*. *Jpn. Kokai Tokkyo Koho* (2011), JP 2011246412 A, 08 Dec 2011. **(GRANTED)**
5. Mishra, A.; Padhi, S. K.* *A process for the hydrogenation of carbon dioxide (CO₂) to methanol*, Indian Patent Application No. 202431048508, 2024. **(Published)**