



Publications and Patents

Journal Cover Articles

1. Padhi, S. K.^{*}, et al. **Inside Back Cover:** *Chem. Commun.*, **2026**, 62, 5991–5991.
2. Padhi, S. K.^{*}, et al. **Back Cover:** *Dalton Trans.*, **2026**, 55, 7415–7416.
3. Padhi, S. K.^{*}, et al. **Back Cover:** *Dalton Transactions*, **2025**, 54, 16993–16994.
4. Padhi, S. K.^{*}, et al. **Inside Back Cover:** *Catalysis Science & Technology*, **2025**, 15, 7251.
5. Padhi, S. K.^{*}, et al. **Inside Back Cover:** *Dalton Transactions*, **2025**, 54, 14227.
6. Mishra, A.; Makhal, K.; Raj, D.; Pasupalak, S.; Mallik, B. S.^{*}; Nordlander, E.^{*}; Padhi, S. K.^{*} **Front Cover:** *Hydrogenation of CO₂ to Methanol by a Nickel Pincer Catalyst and Mechanistic Investigations by DFT Studies*, *European Journal of Inorganic Chemistry*, **2025**, 28(21), e70000.
7. Akhter, S. Sk.; Srivastava, D.; Mishra, A.; Patra, N.; Kumar, P.; Padhi, S. K.^{*} **Cover Feature:** *Physicochemical Analysis of Cu(II)-Driven Electrochemical CO₂ Reduction and its Competition with Proton Reduction*, *Chemistry – A European Journal*, **2024**, 30, e202487004.

Publications

1. Natarajan, M. T.; Padhi, S. K.^{*} *Hydride-Mediated Ammonia Borane Dehydrogenation in Water by Arene-Ru(II) Catalysts Revealed through Real-Time Gas Evolution*, *Chem. Commun.*, **2026**, 62, 5880–5884. (**Inside Back Cover**)
2. Natarajan, M. T.; Teja, D.; Akhter, S. Sk.; Bhardwaj, P.; Kumar, P.; Mallik, B. S.; Padhi, S. K.^{*} *Electrocatalytic Ammonia Oxidation Mediated by a Cu(II) Complex: A Hydrazine Pathway to Hydrogen Generation*, *Dalton Trans.*, **2026**, 55, 7111–7126. (**Back Cover**)
3. Pradhan, A.; Natarajan, M. T.; Rana, R.; Pradhan, T. K.; Padhi, S. K.; Samal, S. L.^{*} *Iodine Incorporated Direct Band Gap Materials for Enhanced Electrochemical Hydrogen Evolution: Role of Structural Distortion and Weak Metal–Halide Bond*, *Dalton Trans.*, **2026**, XX, XXX–XXX.

4. Chinnasamy, P.; Tamilarasan, S.; Sahoo, M.; Padhi, S. K.; Thangavelu, S.* *Hierarchical Polymorphic Nickel–Tin Sulfides/MWCNT for Permselective Electroreduction of CO₂ to Formate: RRDE-Assisted Product Validation*, **ACS Appl. Energy Mater.**, **2026**, *XX*, XXX–XXX.
5. Akhter, S. Sk.; Makhal, K.; Raj, D.; Raj, M.; Natarajan, M. T.; Mallik, B. S.; Bhardwaj, P.; Kumar, P.; Nordlander, E.; Padhi, S. K.* *Selective Electrochemical CO₂ Reduction to CO by a Co(II) Dimer Catalyst by Metal-Ligand Cooperativity*, **Dalton Trans.**, **2025**, *54*, 16682–16696.
6. Akhter, S. Sk.; Makhal, K.; Raj, D.; Natarajan, M. T.; Jaiswal, P. K.; Biswas, A.; Mallik, B. S.; Kumar, P.; Padhi, S. K.* *Manoeuvring Organo-electrocatalytic Selective CO₂ Reduction to CO by Terpyridine Derivatives*, **Catal. Sci. Technol.**, **2025**, *15*, 7043–7058.
7. Raj, D.; Makhal, K.; Raj, M.; Mishra, A.; Mahapatra, R.; Pattnaik, T.; Mallik, B. S.; Padhi, S. K.* *Electrochemical Water Oxidation using Single-Site Cu(II) Molecular Complexes: A Mechanism Elucidated by Computational Studies*, **Dalton Trans.**, **2025**, *54*, 13894–13908. **HOT ARTICLE**
8. Mishra, A.; Makhal, K.; Raj, D.; Pasupalak, S.; Mallik, B. S.*; Nordlander, E.*; Padhi, S. K.* *Hydrogenation of CO₂ to Methanol by a Nickel Pincer Catalyst and Mechanistic Investigations by DFT Studies*, **Eur. J. Inorg. Chem.**, **2025**, *28(21)*, e202500138.
9. Raj, M.; Padhi, S. K.* *Decoding the Catalytic Potential of Dinuclear 1st-Row Transition Metal Complexes for Proton Reduction and Water Oxidation*, *Chem. Rec.*, **2025**, *25*, e202400170. (Invited Article)
10. Mishra, A.; Padhi, S. K.* *Harnessing Ruthenium and Copper Catalysts for Formate Dehydrogenase Reactions*, *Chem. Rec.*, **2024**, *24*, e202400172. (Invited Article)
11. Akhter, S. Sk.; Srivastava, D.; Mishra, A.; Patra, N.; Kumar, P.; Padhi, S. K.* *Physicochemical Analysis of Cu(II)-Driven Electrochemical CO₂ Reduction and its Competition with Proton Reduction*, *Chem. Eur. J.*, **2024**, *30*, e202403321.
12. Mishra, A.; Srivastav, D.; Raj, D.; Patra, N.; Padhi, S. K.* *Formate Dehydrogenase Activity by a Cu(II)-based Molecular Catalyst and Deciphering the Mechanism by DFT studies*, *Dalton Trans.*, **2024**, *53*, 1209–1220.

13. Maity, N.; Mishra, A.; Mishra, A.; Barman, S.; Padhi, S. K.; Panda, B. B.; Jaseer, E. A.; Javid, M. *Tuning Pd to Ag Ratio to Enhance Synergistic Activity of Fly Ash Supported Pd_xAg_y Bimetallic Nanoparticles*, *ACS Omega*, **2024**, 9, 1020–1028.
14. Raj, M.; Makhal, K.; Raj, D.; Mishra, A.; Mallik, B. S.; Padhi, S. K.* *Electrocatalytic Hydrogen Evolution by a Dinuclear Copper Complex and Mechanistic Elucidation through DFT Studies*, *Dalton Trans.*, **2023**, 52, 17797–17809.
15. Raj, M.; Makhal, K.; Mishra, A.; Mallik, B. S.; Padhi, S. K.* *Ligand-mediated Hydrogen Evolution by Co(II) Complexes and Assessment of the Mechanism by Computational Studies*, *Inorg. Chem.*, **2023**, 62, 10993–11008.
16. Vatsa, A.; Mishra, A.; Padhi, S. K.* *Monitoring of Catalytic Dehydrogenation of Formic Acid by a Ruthenium(II) Complex through Manometry*, *Inorg. Chem. Commun.*, **2022**, 144, 109898.
17. Vatsa, A.; Padhi, S. K.* *Formic Acid Dehydrogenation by [Ru(η^6 -benzene)(L)Cl] Catalysts: L = 2-methylquinolin-8-olate and quinolin-8-olate*, *New J. Chem.*, **2022**, 46, 15723–15731.
18. Raj, M.; Padhi, S. K.* *Water Oxidation by a Neoteric Dinuclear Mn(II) Electrocatalyst in Aqueous Medium*, *Eur. J. Inorg. Chem.*, **2022**, 2022(21), e202200238.
19. Akhter, S. Sk.; Padhi, S. K.* *Electro-catalytic CO₂ Reduction to Syngas and HCOOH by Homogeneous FcNAP2*, *Eur. J. Inorg. Chem.*, **2022**, 2022(20), e202200206.
20. Raj, M.; Padhi, S. K.* *Electrocatalytic Proton Reduction by Dinuclear Cobalt Complexes in Nonaqueous Electrolyte*, *New J. Chem.*, **2022**, 46, 6027–6038.
21. Raj, D.; Padhi, S. K.* *The Sporadic μ -Pyridine Bridge in Transition Metal Complexes: A Real Bond or an Interaction?*, *Coord. Chem. Rev.*, **2022**, 450, 214238.
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27. Padhi, S. K.*; Ahmad, E.; Rai, S.; Panda, B. *Kinetics and Mechanistic Study of Electrocatalytic Hydrogen Evolution by $[Co(Fc-tpy)_2]^{2+}$* , *Polyhedron*, **2020**, 187, 114677. (Cover Page)
28. Padhi, S. K.*; Rai, S.; Akhter, S. Sk. *Redox Induced Structural Switching Through Sporadic Pyridine Bridged Co(II)Co(II) Dimer and Electrocatalytic Proton Reduction*, *Inorg. Chem.*, **2020**, 59, 7810–7821.
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48. Padhi, S. K.; Sahu, R.; Saha, D.; Manivannan, V. *Protonated 4'-(2-pyridyl)-2,2':6',2''-terpyridine and its Fe(II) Bischelates: Syntheses and Molecular Structures*, *Inorg. Chim. Acta*, **2011**, 372, 383–388.
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51. Sahu, R.; Padhi, S. K.; Jena, H. S.; Manivannan, V. *Conversion of 2-(aminomethyl) Substituted Pyridine and Quinoline to Their Dicarboxyldiimides Using Copper(II) Acetate*, *Inorg. Chim. Acta*, **2010**, 363, 1448–1454.
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60. Padhi, S. K.; Manivannan, V. *$Cu(NO_3)_2 \cdot 3H_2O$ -Mediated Synthesis of $4'-(2\text{-pyridyl})-2,2':6',2''\text{-terpyridine}$ (L2) from N -(2-pyridylmethyl)pyridine-2-methylketimine (L1): A C–C Bond-Forming Reaction and the Structure of $\{[Cu(L2)(OH)(NO_3)][Cu(L2)(NO_3)_2] \cdot 2H_2O\}$* , *Inorg. Chem.*, **2006**, 45, 7994–7996.

Patents

1. Mishra, A.; and Padhi, S. K.* *A process for the hydrogenation of carbon dioxide (CO_2) to methanol*. Indian Patent Application No. 202431048508, Filed on 25th June 2024. **(Status: Published)**
2. Roy, T.; Natarajan, M. T.; Jana, S.; Das, P.; and Padhi, S. K.* *A Fluoro-Bridged Mixed Valence Dinuclear Copper Complex: Synthesis, Characterization, and Use in the Oxidation Reactions*. Indian Patent Application No. 202531111630, Filed: 14 Nov 2025. **(Status: GRANTED)**
3. Mishra, A.; and Padhi, S. K.* *A process for the preparation of methanol by the hydrogenation of bicarbonate and carbon dioxide (CO_2) captured from air*. Indian Patent Application No. 202431048509, Filed on 25th June 2024. **(Status: GRANTED)**

4. Natarajan, T.; and Padhi, S. K.* *A catalyst for green hydrogen generation, a process for the preparation thereof and the use thereof for green hydrogen generation from ammonia.* Indian Patent Application No. 202431070872, Filed on 19th Sept. 2024. **(Status: GRANTED)**
5. 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. **(Status: GRANTED)**