Curriculum Vitae

Dipankar Panigrahi
Gender: Male
Date of birth: 24-05-1992
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Academic Credentials

Doctor of Philosophy (Ph.D.) in Chemistry [July, 2015 – 2022]

Institute: Indian Institute of Technology Kharagpur, Kharagpur, West Bengal, India.

Research Topic: Transition metal complexes and their applications.

Thesis Title: "Synthesis and Structural Characterization of Metal Complexes Bearing New N- and P-Donor Ligands with Catalysis and DFT Studies"

PhD Advisor: *Prof. Ganesan Mani*, Department of Chemistry, IIT Kharagpur.

Master of Science (M.Sc.) in Chemistry [June, 2015]

Institute: Ramakrishna Mission Residential College (Autonomous), Narendrapur, Kolkata, West Bengal, India.

Percentage of marks obtained: 71.4 (first class).

*Thesis Title***:** Properties of Porous SiC Ceramics Processed by Gelation and Consolidation of Boehmite Coated SiC Suspensions.

*Supervisor***:** Dr. Nijhuma Kayal (Mondal), Principal Scientist, Membrane and Separation Technology Division, CSIR-Central Glass & Ceramic Research Institute, Kolkata, WB, India.

Bachelor of Science (B.Sc.) in Chemistry [June, 2013]

Institute: Ramakrishna Mission Vivekananda Centenary College, Rahara, Kolkata, West Bengal, India.

Percentage of marks obtained: 70.5 (first class).

Research Publications/Papers under review

(1) **Panigrahi, D.**; Mondal, M.; Gupta, R.; and Mani, G. Four- and five-coordinate nickel(II) complexes bearing new diphosphine-phosphonite and triphosphine-phosphite ligands: catalysts for *N*-alkylation of amines. *RSC Adv.*, **2022**, *12*, 4510-4520.

(2) **Panigrahi, D.**; Subramaniyan, V.; and Mani, G. Synthesis and structural characterizations of Pd(II) complexes bearing the new hexahydropyrimidine and tetrahydropyrimidinium based bis(pyrazole) ligands with DFT studies. *J. Mol. Str.*, **2021**, *1231*, 129949.

(3) Baitalik, S; **Panigrahi, D.**; and Kayal, N. Properties of porous SiC ceramics processed by gelation and consolidation of boehmite coated SiC suspensions. *Trans. Ind. Ceram. Soc*., **2017**, *76*, 222-227.

(4) **Panigrahi, D.**; Guchhait, T.; and Mani, G. New iodocuprate(I) clusters bearing tetrahydropyrimidinium-based bis(pyrazole) ligand: role of counter anions in the structural formation. (Manuscript under preparation).

Awards & Achievements

1. Awarded National Fellowship from Council of Scientific and Industrial Research (CSIR), Human Resource Development Group, New Delhi, Govt. of India.
Subject: Chemical Science, *Rank: 34 (JRF)*, Date: 21st August, 2015.
- For pursuing doctoral study on the basis of qualifying National Eligibility Test.

2. Ranked 750 in Graduate Aptitude Test in Engineering (GATE)
Subject: Chemistry, Date: February, 2015
- All India examination conducted by Department of Secondary and Higher Education, Ministry of Human Resource Development, Government of India

3. Ranked 244 in Joint Admission Test to M. Sc. (JAM)
Subject: Chemistry, Date: February, 2013
- All India joint entrance examination for admission in IIT.

4. Awarded Merit-cum-Means Scholarship from Govt. of West Bengal [2013 – 2015]

Conference Proceedings

1. Participated in Sixth and Seventh One Day "Research Scholar Day" organized by the Department of Chemistry, Indian Institute of Technology Kharagpur, India (16th September 2017 and 6th October, 2018).
2. Graduate student registration seminar given Oral presentation "Synthesis and Structural Characterization of Nickel(II) and Cobalt(II) Complexes supported by New Multidentate Phosphorus Ligands" (18th October, 2017).
3. Symposium on Recent Advances in Functional Inorganic & Nanomaterials Chemistry (RAFINC) held in the Department of Chemistry, Indian Institute of Technology Kharagpur, Khaagpur, India. Represented poster entitled "Ttansition Metal and Main Group Compounds for Catalytic Applications" (11th November, 2017).
4. One day international Symposium on Recent Advances in Molecular Magnetism organized by the Department of Chemistry, Indian Institute of Technology Kharagpur, India (26th November, 2019).

5. Symposium on Modern Trends in Inorganic Chemistry (MTIC–XVIII) held in the Department of Chemistry, Indian Institute of Technology Guwahati, India. Represented poster entitled "Synthesis and Structural Characterization of Pd(II) Complexes Supported by New Hexahydropyrimidine-based bis(pyrazole) Ligand" (11th - 14th December, 2019).

Research Experience

- *Four- and five-coordinate nickel(II) complexes bearing new diphosphine-phosphonite and triphosphine-phosphite ligands: catalysts for N-alkylation of amines*

Designed and synthesized a series of highly air sensitive new phosphine Ligands. All the ligands were characterized by ^{31}P, ^{1}H, ^{13}C, DEPT and HRMS spectral methods. Series of Ni(II) complexes were isolated and their reactivity was studied. All the complexes were characterized by single crystal XRD method along with ^{31}P, ^{19}F, ^{11}B, ^{1}H, ^{13}C, HRMS and CHN analysis. P(III) atom bonded Ni(II) complexes were excellent to catalyze *N*-alkylation of aromatic amines in the presence of considerably low amount of the precatalyst loading. *N*-alkylation catalysis proceeds even for the sterically encumbered and heterocyclic amines and with an aromatic/aliphatic alcohol.

- *Synthesis and structural characterizations of Pd(II) complexes bearing the new hexahydropyrimidine and tetrahydropyrimidinium based bis(pyrazole) ligands with DFT studies*

Designed and synthesized N-donor air stable pro-carbene ligand by one pot method. Several derivatives were made from the synthesized ligand and were characterised by NMR and Mass spectrometry. Series of Pd(II) complexes were isolated were characterized by single crystal XRD method along with NMR, HRMS and CHN analysis. Variable Temperature ^{1}H NMR data was helpful to observe fluxionality in the molecule. DFT studies were performed to understand bonding properties.

- *New iodocuprate(I) clusters bearing tetrahydropyrimidinium-based bis(pyrazole) ligand: role of counter anions in the structural formation*

Series of new air sensitive Cu(I) complexes were isolated using synthesized N-donor ligands. The clusters include Cu_2X_2 (X = Br, I), Cu_2I_3, Cu_2I_4 and Cu_3I_4 units. All the complexes were different in structure and exist as monomer, dimer and polymer. Complexes were isolated using the schlenk link techniques and were characterized by single crystal XRD, NMR, HRMS and CHN analysis. Variable Temperature ^{1}H NMR data was helpful to observe fluxionality. Photoluminescence properties were studied for all the ligands and Cu(I) complexes.

- *Synthesis and structural characterization of metal complexes and applications*

Designed and synthesized several new types of N- and P-donor ligands. Their complexes with different metal salts (*group 6 to 11*) in different oxidation states were isolated. Catalytic applications were performed towards C–N coupling and ethylene/norbornene polymerization.

Teaching Experience

- Engaged as a *teaching assistant* for B.Tech and M.Sc. Chemistry students at IIT Kharagpur since 2015. Encouraged them to persevere with challenging tasks.
- Contributed in guiding of masters and graduate students to start their own research projects.

Technical Experience

- Comfortable with ***Schlenk Line Techniques*** and ***Glove Box*** for handling air sensitive compounds.
- Skilled experiences in catalysis and methodology development for organic synthesis.
- Knowledge on handling of *air stable/air sensitive* organic and transition metal compounds.
- Idea on *Organometallic compounds* synthesis.
- Expertise in chromatographic technique for organic compound separation, purification and Crystallization (both in air/inert atmosphere).
- Experienced in different analytical techniques and comfortable with their analysis data: NMR, XRD, UV, IR, GCMS, LCMS, HRMS, CHN (Data analysis).

Co-curricular Activities

- Participated in various national/international chemistry seminars.
- Attended one Nobel laureate lecture [Prof. Ben Feringa, University of Groningen, Nobel Prize in Chemistry (2016)] at IIT Kharagpur.
- Participated in the various cultural programs at Ramakrishna Mission Calcutta Students' Home, Belghoria, Kolkata.

References

1) Dr. Ganesan Mani, Professor, Chemistry
   Indian Institute of Technology Kharagpur (IIT Kharagpur)
   Kharagpur, West Bengal 721302, India
   Email: gmani@chem.iitkgp.ac.in

2) Dr. N. D. Pradeep Singh, Professor, Chemistry
   Indian Institute of Technology Kharagpur (IIT Kharagpur)
   Kharagpur, West Bengal 721302, India
   Email: ndpradeep@chem.iitkgp.ac.in

3) Dr. Madhab C. Das, Associate Professor, Chemistry
   Indian Institute of Technology Kharagpur (IIT Kharagpur)
   Kharagpur, West Bengal 721302, India
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