Curriculum Vitae

Dr. Dhiraj Das

Post-Doctoral Fellow
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Department of Chemistry,
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PERSONAL INFORMATION

Mailing & Permanent Address: Dr. Dhiraj Das
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PIN – 712122, West Bengal, India

Contact Number:	+91-8116396734
Date of Birth:	28th April, 1988
Place of Birth:	Gopaldanga, Hooghly, West Bengal
Nationality:	Indian
Gender:	Male
Marital Status:	Married

EDUCATION

1. *Doctor of Philosophy*: Synthetic Inorganic Chemistry, Dept. of Chemistry,
Indian Institute of Technology (IIT), Kharagpur, India.
(**18th June 2012 - 21st June 2017**).

Mentor: Prof. Manish Bhattacharjee
Thesis Title: **Synthesis, Structure and Properties of Heterometallic Complexes Containing Molybdenum and Vanadium Metalloligands.**

2. *Master of Science*: M.Sc. in Chemistry with One Year Research Project,
Indian Institute of Technology, Kharagpur, India.
(**June 2010 - May 2012**).
M. Sc. Thesis Title: **Synthesis, Characterization and Structure of Heterobimetallic Complexes using Metalloligand.**
Result: CGPA 8.46 out of 10.

3. *Bachelor of Science*: B. Sc. in Chemistry (Hons.), **Midnapore College** under Vidyasagar University, Midnapore, India. (**2007 - 2010**).
Result: 53.25% (2nd Class).

4. *Higher Secondary (10+2)*: **2006**, W.B.C.H.S.E with 1st class (75%).

ACADEMIC ACHIEVEMENT

- ✓ Qualified Joint Admission Test For M.Sc. (**April 2010**)
- ✓ CSIR-UGC National Eligibility Test (NET) qualified. (**December 2013**)
- ✓ Council of Scientific & Industrial Research (CSIR)-Research Associate (RA) Fellow (**November 2020**)

BOARD AREA OF RESEARCH

My main research area is organometallic chemistry. I have synthesized several heterometallic compounds using organic ligands. The organic ligands were synthesized using different organic transformation reactions (e.g. Mannich reaction, Sonogashira reaction, Suzuki reaction, etc.). Then those compounds have been characterized by single-crystal X-ray diffraction studies and other spectroscopic techniques (e.g. NMR, IR, UV/Vis, etc.). After that, I have studied their properties like catalytic, magnetic, adsorption, fluorescent. In addition, I am also familiar with computational chemistry.

My research work mainly focused on:

1. Synthesis of organic ligands and then their complexation with the metal ions.
2. Catalysis
3. Structural and magnetic characterization.
4. Dye and Gas adsorption studies.
5. Photo-switching of Azobenzenes.

SKILL AND EXPERIENCES

I have skill in single crystal X-ray crystallography, molecular magnetism, synthesis, schlenk line technique, Column chromatography, etc. I have hands-on experiences with the following instruments: Single-crystal X-ray diffractometer (Bruker, Rigaku), Powder X-ray diffractometer (Rigaku), UV-Visible Spectrophotometer, FT-IR Spectrophotometer, Fluorescence Spectrophotometer, Differential Scanning Calorimetry (DSC), Atomic Absorption Spectroscopy (AAS), Thermogravimetry Analysis (TGA), NMR (200 MHz and 400; Bruker) Spectroscopy, GC (ThermoFisher Scientific).

During my Ph.D. and Post-doctoral work, I have conducted graduation classes and have some teaching experiences.

RESEARCH EXPERIENCES

1. University of Calcutta, Kolkata, India (2021 - tilldate)

CSIR-RA, *Dept. of Chemistry*

Mentor: Dr. Kuntal Pal

- **Roles & Responsibilities: Research and Developments**
  - ✓ Catalysis

2. Indian Institute of Science Education and Research (IISER), Tirupati, India (2020 – 2021)

Postdoctoral Research Fellow, Dept. of Chemistry

Mentor: Dr. Arun Kumar Bar

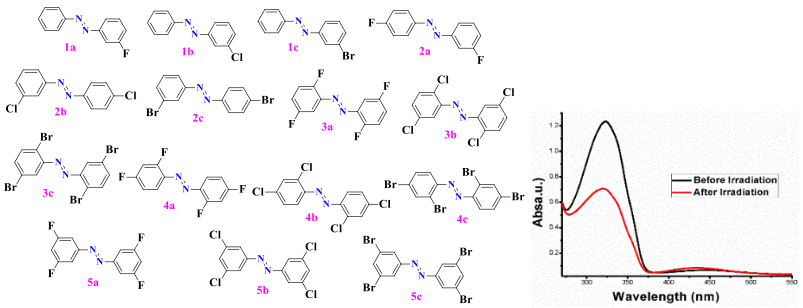
- **Roles & Responsibilities: Research and Developments**
  - ✓ Synthesis and Molecular Magnetism

3. Indian Institute of Science Education and Research (IISER), Mohali, India (2017 - 2019)

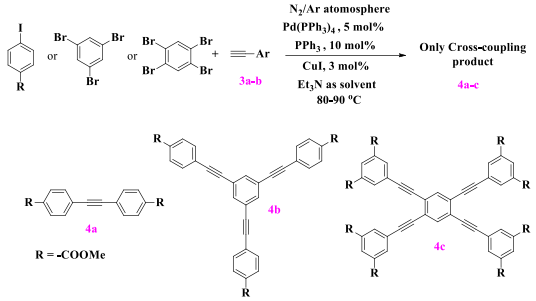
Postdoctoral Research Fellow, Dept. of Chemical Sciences

Mentor: Prof. Angshuman Roy Choudhury

- **Roles & Responsibilities: Research and Developments**
  - ✓ (a) Synthesis, Structure, and Photo-physical Properties of Symmetrical and Unsymmetrical Azobenzenes: Experimental and Computation Studies.
  - ✓ (b) Synthesis of C_3/C_2 symmetry ligands for the synthesis of Metal Organic Frameworks (MOFs).



(a)



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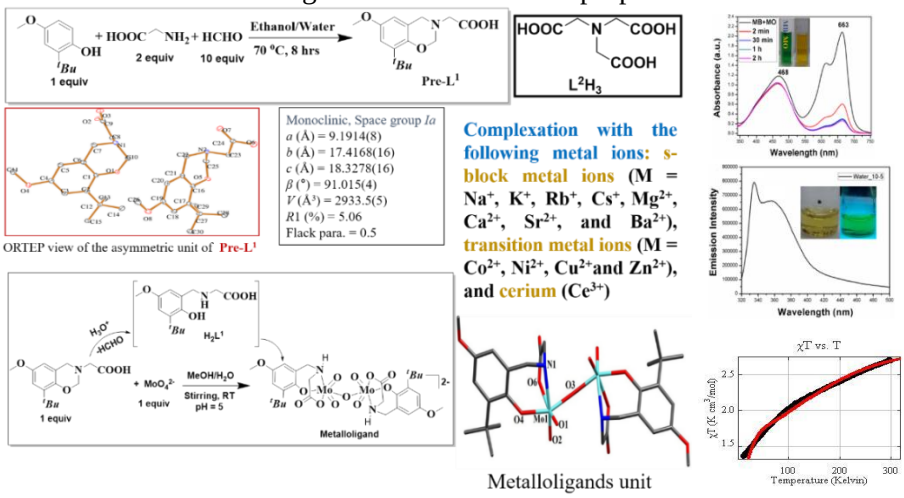
4. Indian Institute of Technology (IIT), Kharagpur, India (Ph.D. 2012 – 2017)

Research Assistant, Dept. of Chemistry

Adviser: Prof. Manish Bhattacharjee

- **Roles & Responsibilities: Research and Developments**
  - ✓ Synthesis, characterization and structure of heterobimetallic complexes using molybdenum metalloligand and those have been used as a precursor for nanostructured mixed metal oxides.
  - ✓ Induction of chirality from organic ligand to the heterobimetallic supramolecular helical packing.
  - ✓ Synthesis, characterization and structure of heterotrimetallic complexes using molybdenum metalloligand and their dye adsorption properties.
  - ✓ Structural diversity of heterobimetallic compounds Mo(VI)-M(II) (M = Mg, Ca, Sr and Ba): Monomer to 1D coordination polymers. The synthesis of mixed metal oxides from heterobimetallic compounds and their gas as well as selective dye adsorption properties.
  - ✓ Synthesis, characterization, and structure of heterotrimetallic complexes and their magnetic properties.
  - ✓ Synthesis, characterization, and structure of the heterobimetallic complex of vanadium and cerium and its magnetic and luminescent properties.



INSTRUMENTS USED

- ✓ Single Crystal X-ray Diffraction (Rigaku and Bruker).
- ✓ Powder X-ray Diffraction (PXRD, Rigaku and Bruker).
- ✓ X-ray Photoelectron Spectroscopy (XPS).
- ✓ Spectrofluorometer (Jobin Yvon-fluorolog and Hitachi).
- ✓ UV-Visible Spectrophotometer (Shimadzu 2450).
- ✓ NMR (1D, 2D), Bruker (200 MHz and 400 MHz).
- ✓ FT-IR (PerkinElmer).
- ✓ Cyclic Voltammetry (CH Instrument).
- ✓ Circular Dichroism (Jasco)
- ✓ Field Emission Scanning Electron Microscopy (FESEM).
- ✓ Quantum Design MPMS SQUID VSM magnetometer.
- ✓ AAS, TGA, and DSC
- ✓ BET-Sorptometer
- ✓ GC (ThermoFisher Scientific)

TEACHING EXPERIENCES

1. IISER Mohali, India (Jan. 2018 - Aug. 2019)

Teaching Assistant (BS-MS class), Department of Chemical Sciences

2. IIT Kharagpur, India (June 2012 - June 2017)

Teaching Assistant, Department of Chemistry

- ✓ Inorganic Chemistry Laboratory Instructor in 1st year and 3rd year B. Tech classes.
- ✓ Inorganic Chemistry Tutor in B. Tech 1st year tutorial classes.
- ✓ Mentored three undergraduate research assistants, responsible for design and execution of their individual research projects.

3. Institute of Science and Technology. Chandrakona-721201, Paschim Midnapore, West Bengal, India.

Assistant Professor, Dept. of Chemistry (**2nd Aug, 2017 - 08th Sept. 2017**)

PUBLICATIONS

20. Jena, R. K.; **Das, D. "**Enantio- and regioselective asymmetric allylic substitution using a chiral aminophosphinite ruthenium complex: an experimental and theoretical investigation." *RSC Advances*, **2021**, *11*, 39319-39327. [ISSN: 2046-2069; IF = 3.361; Citation = 0]

19. Das, D.; Yadav, M. K.; Singla, L.; Kumar, A.; Karanam, M.; Dev, S.; Choudhury, A. R. "Understanding of the Kinetic Stability of *cis*- Isomer of Azobenzenes through Kinetic and Computational Studies." *ChemistrySelect*, **2020**, *5*, 13957-13962. [ISSN: 2365-6549; IF = 2.109; Citation = 1].

18. Majumdar, D.; **Das, D.**; Nag, S.; Bhattacharyya, M.; Singh, D. K.; Parai, D.; Bankura, K.; Mishra, D. "A rare hetero-bimetallic Zn(II)/Ca(II) Schiff base complex: Synthesis, crystal structure, DFT, molecular docking and unveiling antimicrobial activity." *J. Mol. Struct*., **2020**, *1222*, 128951-128966. [ISSN: 0022-2860; IF = 3.196; Citation = 9]

17. Majumdar, D.; **Das, D.**; Sreejith, S. S.; Nag, S.; Dey, S.; Mondal, S.; Bankura, K.; Mishra, D. "Synthesis, characterizations and single crystal structure of di-nuclear azidobridged Cd(II) coordination polymer with Schiff base precursor (H_2Lpent^{OMe}): DFT, fluorescence, solvatochromism and in vitro antimicrobial assay." *Inorga. Chem. Acta*, **2019**, *496*, 119069-119079. [ISSN: 0020-1693; IF = 2.545; Citation = 8].

16. Hajra, S.; Maity, S.; Roy, S.; **Das, D.** "Controlling the regioselectivity of the ring opening of spiro-epoxyoxindoles for efficient synthesis of C(3)-N(1')-bisindolesand C(3)-N(1')diindolylmethane." *Org. Biomol. Chem*. **2019**, *17*, 7747-7759 [ISSN: 1477-0539; IF = 3.876; Citation = 7].

15. **Das, D.*** "Structural Diversity in Heterobimetallic Complexes of Alkaline Earth Metals and Molybdenum, and Selective Dye Adsorption Properties of Mixed Metal Oxides Synthesized from the Heterobimetallic Complexes." *ChemistrySelect*, **2019**, *4*, 1428-1436. [ISSN: 2365-6549; IF = 2.109; Citation = 1].

14. **Das, D.**; Roy Choudhury, A. "Water-assisted Ground State Intra-molecular Proton Transfer in 2,5-dihydroxy-Substituted Azobenzenes: Experimental and Computational Studies." *CrystEngComm.* **2019**, *21*, 2373-2380. [ISSN: 1466-8033; IF = 3.545; Citation = 2].

13. Majumdar, D.; Das, S.; Thomas, R.; Ullah, Z.; Sreejith, S. S.; **Das, D.**; Shukla, P.; Bankura, K.; Mishra, D. "Syntheses, X-ray crystal structures of two new Zn(II)-dicyanamide complexes derived from H2vanen-type compartmental ligands: Investigation of thermal, photoluminescence, in vitro cytotoxic effect and DFT-TDDFT studies." *Inorga. Chem. Acta*, **2019**, *492*, 221-234. [ISSN: 0020-1693; IF = 2.545; Citation = 27].

12. Majumdar, D.; **Das, D.**; Sreejith, S. S.; Das, S.; Biswas, J. K.; Mondal, M.; Ghosh, D.;. Bankura, K ; Mishra, D. "Dicyanamide-interlaced assembly of Zn(II)-Schiff-base complexes derived from salicylaldimino type compartmental ligands: syntheses, crystal structures, FMO, ESP, TD-DFT, fluorescence lifetime, in vitro antibacterial and anti-biofilm properties." *Inorganica Chem. Acta*, **2019**, *489*, 244-254. [ISSN: 0020-1693; IF = 2.545; Citation = 26].

11. Majumdar, D.; Dey, S.; **Das, D.**; Singh, D. K.; Das, S.; Bankura, K.; Mishra, D. "Heterometallic Zn(II)-K(I) complex with salen-type Schiff-base ligand: Synthesis, crystal structure, solid-state photoluminescent property and theoretical study." *J. Mol. Struct*. **2019**, *1185*, 112-120. [ISSN: 0022-2860; IF = 3.196, Citation = 11].

10. Majumdar, D.; Dey, S.; Sreekumar, S. S.; Biswas, J. K.; Mondal, M.; Shukla, P.; Das, S.; Pal, T.; **Das, D.**; Bankura, K.; Mishra. D. "Syntheses, crystal structures and photo physical aspects of azido-bridged tetranuclear cadmium (II) complexes: DFT/TD-DFT, thermal, antibacterial and anti-biofilm properties." *J. Mol. Struct*. **2019**, *1179*, 694-708. [ISSN: 0022-2860; IF = 3.196; Citation = 13].

9. Majumdar, D.; Dey, S.; Sreekumar, S. S.; Das, S.; **Das, D.**; Metre, R. K.; Bankura, K.; Mishra, D. "Nitrato, Pseudohalo-Linked Zn(II)/Cd(II) Schiff-Base Complexes with 1,3Diimine Spacer Group: Syntheses, Crystal Structures, DFT, TD-DFT and Fluorescence Studies." *ChemistrySelect*, **2018**, *3*, 12371-12382. [ISSN: 2365-6549; IF = 2.109; Citation = 10].

8. Hajra, S.; Roy, S. S.; Aziz, S. M.; **Das, D.** "Catalyst-Free "On-Water" Regio- and Stereospecific Ring-Opening of Spiroaziridine Oxindole: Enantiopure Synthesis of Unsymmetrical 3,3′-Bisindoles." *Org. Lett.* **2017**, *19*, 4082-4085. [ISSN: 1523-7052; IF = 6.005; Citation = 37].

7. **Das, D.***; Guha, A. K. "Supramolecular Assembly of Binuclear $[V_2O_3(NTA)_2]^{4-}$ unit with $[Ce(H_2O)_9]^{3+}$: Synthesis, Structure, Luminescent, Magnetic Properties and TD-DFT Calculation." *Polyhedron* **2017**, *137*, 1-9. [ISSN: 0277-5387; IF = 3.052; Citation = 4].

6. **Das, D.**; Bhattacharjee, M. "Synthesis, Structure and Magnetic Properties of Trimetallic Coordination Polymers of Cobalt and Copper." *Eur. J. Inorg. Chem*. **2017**, 2828-2836. [ISSN: 1099-0682; IF = 2.524; Citation = 3].

5. **Das, D.**; Karan, C. K.; Bhattacharjee, M. "Heterotrimetallic Coordination Polymers for Dye Adsorption and Desorption." *Polyhedron* **2017**, *124*, 51-61. [ISSN: 0277-5387; IF = 3.052; Citation = 9].

4. Hajra, S.; Aziz, S. M.; Jana, B.; Mahish, P.; **Das, D.** "Synthesis of Chiral Spiro-Aziridine Oxindoles via Aza-Corey-Chaykovsky Reaction of Isatin Derived N-tert-Butanesulfinyl Ketimines." *Org. Lett.* **2016**, *18*, 532-535. [ISSN: 1523-7052; IF = 6.005; Citation = 39].

3. Singha, R.; Ghosh, M.; Das, S.; **Das, D.**; Ray, J. K. "Synthesis of 1,3-dibromo-2-aryl-1Hindenes via NBS mediated unusual bromination of 2-alkynylbenzaldoximes." *New J. Chem.* **2016**, *40*, 7269-7272. [ISSN: 1369-9261; IF = 3.591; Citation = 4].

2. **Das, D.**; Deb, D.; Sadhukhan, D.; Bhattacharjee, M. "Induction of Chirality from Ligand to the Supramolecular Helical Packing in Mo(VI)-Ln(III) Heterobimetallic Complexes: Synthesis, Structure, and Photoluminescence Properties." *Polyhedron* **2016**, *105*, 222-227. [ISSN: 0277-5387; IF = 3.052; Citation = 4].

1. **Das, D.**; Bhattacharjee, M. "Synthesis and structure of heterobimetallic Mo-M [M = Na, Co, Ni, and Zn] compounds and synthesis of nanostructured mixed metal oxides $MMoO_4$ and MoO_3 [M = Co, Ni, and Zn] from the heterobimetallic complexes." *Polyhedron* **2015**, *99*, 122-131. [ISSN: 0277-5387; IF = 3.052; Citation = 6].

CONFERENCE ATTENDANCES

1. Presented poster in Recent Advances in Organic and Bio-organic Chemistry (RAOBC), entitled as "**Water-assisted Ground State Intra-molecular Proton Transfer in 2,5dihydroxy-Substituted Azobenzenes: Experimental and Computational Studies.**" organized by IISER Mohali, India, **March 22-24, 2019**.
2. Oral presentation at the National Symposium on Chemistry and the Environment (CE2016) and National Convention of Chemistry Teachers (NCCT-2016) on the topic of "**Induction of Chirality from Ligand to the Supramolecular Helical Packing in Mo(VI)-Ln(III) Heterobimetallic Complexes: Synthesis, Structure and Photoluminescence Properties**" organized by Department of Chemistry, Raja Narendralal Khan Women's College, Midnapore, West Bengal, India, on **October 2123, 2016**.
3. Presented poster in 18th CRSI National Symposium in Chemistry, entitled as "**Synthesis and Structure of Heterobimetallic Complexes of Molybdenum Metalloligand and Synthesis of Nanostructured Mixed Metal Oxides $MMoO_4$ and MoO_3 [M = Co, Ni and Zn] from the Heterobimetallic Complexes**" organized by Panjab University and INST Mohali, India, **February 5-7, 2016**.
4. Participated in the 22nd conference of National Magnetic Resonance Society (NMRS) of India held at Indian Institute of Technology Kharagpur during **February 18-21, 2016**.
5. Oral presentation in the 3rd Research Scholars' Day on "**Synthesis and Structure of Heterotrimetallic Compounds of Molybdenum Metalloligand and their Dye Adsorption property**" organized by Department of Chemistry, Indian Institute of Technology Kharagpur on **August 2, 2015**.
6. Participated in full agenda of American Chemical Society (ACS) on campus events at IIT Kharagpur, India on **November 25, 2013**.
7. Participated in the International Symposium entitled "Diamond Jubilee Symposium on Recent Trends in Chemistry" (DJSRTC) held at Indian Institute of Technology Kharagpur during **October 21-23, 2011**.

REFERENCES

1. Dr. Manish Bhattacharjee
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3. Dr. Santanu Chattopadhyay
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