DEBANJAN DHAR

debanjandhar@sxccal.edu | dhar.debanjan@gmail.com

https://www.linkedin.com/in/debanjan-dhar-23b58584/

TEACHING AND OTHER EXPERIENCE

Assistant Professor of Chemistry, Saint Xavier's College (Autonomous), Kolkata — Aug 2025 - present
Teaching Inorganic Chemistry courses

Guest Lecturer at Department of Chemistry, Scottish Church College, Kolkata — Jan 2023 – Jun 2025
Teaching Post-graduate Chemistry courses on Transition metal Chemistry, Bio-inorganic Chemistry, Spectroscopy of Inorganic Compounds, Group Theory and Chemical Bonding

Guest Lecturer at Department of Chemistry, Asutosh College, Kolkata — Aug 2023 – Dec 2024
Teaching Post-graduate Chemistry courses on Chemistry of Coordination compounds

Guest Lecturer at Department of Chemistry, Ramakrishna Mission Residential College, Narendrapur — Feb 2024 – Dec 2024
Teaching Post-graduate Chemistry courses on Chemistry of Organometallic Compounds

Guest Lecturer at Department of Chemistry, University of North Carolina at Chapel Hill — Jan 2018 - Sep 2019
Delivered lectures on Chemical applications of Group Theory in an Advanced Inorganic Chemistry course

Teaching Assistant at Department of Chemistry, University of Minnesota — Sep 2012 – May 2014
Courses taught: General Chemistry, Advanced Inorganic Chemistry, Kinetics and Mechanism of Chemical Reactions

Deputy Lab Safety Officer (Dempsey Group, University of North Carolina at Chapel Hill — May 2018 – Oct 2020

Joint Safety Team (JST), University of Minnesota — May 2013 – May 2016

Lab Safety Officer (Tolman Group, University of Minnesota) — May 2013 – May 2016

RESEARCH EXPERIENCE

Postdoctoral Research Associate
Department of Chemistry, University of North Carolina at Chapel Hill **March 2018 – Jan 2021**
Research Advisor: Prof. Jillian L. Dempsey
Electrochemistry of covalently attached electroactive materials, Proton Coupled Electron Transfer reactivity of Metal-hydride complexes for use in Solar Fuel production

Doctoral Research Assistant
Department of Chemistry, University of Minnesota **Jan 2013 - Dec 2017**
Thesis Title: *"Properties and Hydrogen Atom Transfer Reactivity of Copper(III)-hydroxide complexes"*
Research Advisor: Prof. William B. Tolman
Synthesis, characterization and reactivity of mononuclear copper-oxygen intermediates with a significant focus on kinetic and mechanistic studies of hydrogen atom transfer reactions of such reactive species

Research Assistant
Department of Chemistry, Indian Institute of Technology Kanpur **July 2011- May 2012**
Research Advisor: Prof. Rabindranath Mukherjee
DST-DFG (Indo – German) project utilizing multiple redox-active metal centers to perform multi-electron oxidation processes

Masters Research Project Student
Department of Chemistry, Indian Institute of Technology Kanpur **Dec 2010 - May 2011**
Research Advisor: Prof. Rabindranath Mukherjee
Thesis title: *"Synthesis and studies of metal coordinated radical complexes of Cobalt(II), Nickel(II) and Copper(II) with a new hexa-dentate Sulphur based ortho-iminophenolate ligand"*
Synthesis and characterization of metal coordinated radical complexes of a redox non-innocent ligand with significant focus on spectroscopic determination of the oxidation states of metal centers

JENESYS (*JSPS Exchange Program for East Asian Young Researchers*) Research Fellow
Institute of Molecular Sciences, Okazaki, Japan **May 2010 - July 2010**
Research Advisor: Prof. Kunihiro Kuwajima
Investigation of denaturation and protein folding kinetics of OspA (Outer surface protein A) under different conditions using Circular Dichroism Spectroscopy

Undergraduate Research Apprentice
Indian Association for the Cultivation of Sciences, Kolkata **May 2009 - July 2009**
Research Advisor: Prof. Amitabha Sarkar
Synthesis and characterization of organometallic compounds to be used as self-assembled monolayers for protein immobilization

Undergraduate Research Apprentice
Saha Institute for Nuclear Physics, Kolkata **Oct 2007 - Dec 2007**
Research Advisor: Prof. Abhijit Chakrabarti
Alterations of phase transition temperatures of phospholipid membranes due to interactions with hemoglobin variants monitored using fluorescence spectroscopy

RESEARCH INTERESTS

- Proton-coupled Electron Transfer
- Electrochemistry
- Kinetics and Mechanism of Chemical Reactions
- Bioinorganic Chemistry
- Surface Chemistry
- C-H bond activation

PUBLICATIONS

1. Dhar, D.; Tolman, W. B. *J. Am. Chem. Soc.* **2015**, *137*, 1322-1329.
"Hydrogen Atom Abstraction from Hydrocarbons by a Copper(III)-Hydroxide Complex"
http://pubs.acs.org/doi/10.1021/ja512014z

2. Dhar, D.; Yee, G. M.; Spaeth, A. D.; Boyce, D. W.; Zhang, H.; Dereli, B.; Cramer, C. J.; Tolman, W. B. *J. Am. Chem. Soc.* **2016**, *138*, 356-368.
"Perturbing the Copper(III)-Hydroxide Unit through Ligand Structural variation"
http://pubs.acs.org/doi/10.1021/jacs.5b10985

3. Ali, A.; Dhar, D.; Barman, S. K.; Lloret, F.; Mukherjee, R. *Inorg. Chem.* **2016**, *55*, 5759-5771.
"Nickel(II) Complex of a Hexadentate ligand with two *o*-Iminosemiquinonato(1-) π-Radical units and its Monocation and Dication"
http://pubs.acs.org/doi/10.1021/acs.inorgchem.5b02688

4. Dhar, D.; Yee, G. M.; Markle, T. F., Mayer, J. M.; Tolman, W. B. *Chem. Sci.* **2017**, *8*, 1075-1085.
"Reactivity of the Copper(III)-Hydroxide Unit with Phenols"
http://pubs.rsc.org/en/content/articlehtml/2017/SC/C6SC03039D

5. Elwell, C. E.; Gagnon, N. L.; Neisen, B. D.; Dhar, D.; Spaeth, A. D.; Yee, G.M.; Tolman, W. B. *Chem. Rev.*, **2017**, *117*, 2059-2107.
"Copper-Oxygen Complexes Revisited: Structures, Spectroscopy, and Reactivity"
http://pubs.acs.org/doi/10.1021/acs.chemrev.6b00636

6. Spaeth, A. D.; Gagnon, N. L.; Dhar, D.; Yee, G. M.; Tolman, W. B. *J. Am. Chem. Soc.* **2017**, *139*, 4477-4485.
"Determination of the Cu(III)-OH Bond Distance by Resonance Raman Spectroscopy Using a Normalized Version of Badger's Rule"
http://pubs.acs.org/doi/10.1021/jacs.7b00210

7. Neisen, B. D.; Gagnon, N. L.; Dhar, D.; Spaeth, A. D.; Tolman, W. B. *J. Am. Chem. Soc.* **2017**, *139*, 10220-10223.
"Formally Copper(III)-alkylperoxo complexes as models of possible intermediates in Monooxygenase enzymes"
http://pubs.acs.org/doi/10.1021/jacs.7b05754

8. Makabe, K.; Nakamura, T.; Dhar, D.; Ikura, T.; Koide, S., Kuwajima, K. *J. Mol. Biol.* **2018**, *430*, 1799-1813.
"An Overlapping Region between the Two Terminal Folding Units of the Outer Surface Protein A (OspA) Controls Its Folding Behavior"
https://doi.org/10.1016/j.jmb.2018.04.025

9. Dhar, D.; Yee, G. M.; Tolman, W. B. *Inorg. Chem.* **2018**, *57*, 9794-9806.
"Effects of Charged Ligand Substituents on the properties of the Formally Copper(III)-Hydroxide ($[CuOH]^{2+}$) Unit"
https://pubs.acs.org/doi/10.1021/acs.inorgchem.8b01529

10. Bailey, W. D.; Dhar, D.; Cramblitt, A. C.; Tolman, W. B. *J. Am. Chem. Soc.* **2019**, *141*, 5470-5480.
"Mechanistic dichotomy in proton-coupled electron-transfer reactions of phenols with a copper superoxide complex"
https://pubs.acs.org/doi/10.1021/jacs.9b00466

11. Dhar, D.; McKenas, C. G.; Huang, CW; Atkin, J. M.; Dempsey, J. L.; Lockett, M. R. *ACS Appl. Energy Mater.* **2020**, *3*, 8038–8047.
"Quantitative Effects of Disorder on Chemically Modified Amorphous Carbon Electrodes"
https://doi.org/10.1021/acsaem.0c01434

12. Kurtz, D. A.; Dhar, D.; Elgrishi, N.;Kandemir, B.;McWillaims, S. F.; Howland, W. C.; Chen, C-H.; Dempsey, J. L. *J. Am. Chem. Soc.* **2021**, *143*, 3393-3406.
"Redox-Induced Structural Reorganization Dictates Kinetics of Cobalt (III) Hydride Formation via Proton-Coupled Electron Transfer"
https://pubs.acs.org/doi/abs/10.1021/jacs.0c11992

EDUCATION

University of Minnesota, Minneapolis, MN, USA **2012 - 2017**
Chemistry Ph.D. Candidate, Thesis Advisor: Prof. William B. Tolman

CSIR-UGC NET JRF **2012**

Indian Institute of Technology Kanpur, Kanpur, India **2009-2011**
M.Sc. (Chemistry)

Presidency College (University of Calcutta), Kolkata, India **2006-2009**
B.Sc. (Chemistry Honours) *(First Class First- University Gold Medalist)*

PRESENTATIONS

Oral:

Applications of Proton coupled Electron transfer studies to model complexes and the approach to covalently attach catalysts on electrode surfaces
IISER Kolkata - Invited Lecture, July 2019, *Kolkata, India*

Mechanistic Nuances of Hydrogen Atom Abstraction by the Copper(III)-Hydroxide Unit
253rd American Chemical Society National Meeting and Exposition, April 2017, *San Francisco, USA.*

Hydrogen Atom Transfer by Copper(III)-Hydroxide Complexes
5th Symposium on Advanced Biological Inorganic Chemistry (SBIC Young Presenters session), January 2017, *Kolkata, India*.

Thermodynamic Insights into the Kinetics of Hydrogen Atom Abstraction by Mononuclear Copper(III)-Hydroxide Cores
(*Awarded the *Beaker and Bunsen Award*)
Graduate Student Research Symposium, Department of Chemistry (UMN), June 2015, *Minneapolis, USA.*

Is Thermodynamics a key player in the Hydrogen Atom Abstraction by mononuclear Copper(III)-Hydroxide complexes?
UMN Metalloprotein Interest Group (MPIG) – Invited Lecture, March 2015, *Minneapolis, USA.*

Poster:

Dhar, D.; McKenas, C. G.; Huang, CW; Atkin, J. M.; Dempsey, J. L.; Lockett, M. R.
Exploring the effects of disorder on covalently modified carbon electrodes
2020 Electrochemistry Gordon Research Conference, January 2020, *Ventura, USA*

Dhar, D.; Yee, G. M.; Tolman, W. B.
Hydrogen Atom Transfer by Copper(III)-Hydroxide Complexes
3rd International Conference on Proton Coupled Electron Transfer, June 2018, *Blowing Rock, USA*

Gagnon, N. L.; Dhar, D.; Tolman, W. B.
Characterization of a Copper(III)-Phenoxide Complex
253rd American Chemical Society National Meeting and Exposition, April 2017, *San Francisco, USA*.

Dhar, D.; Yee, G. M.; Markle, T. F., Mayer, J. M.; Tolman, W. B.
Hydrogen Atom Transfer by Copper(III)-Hydroxide Complexes (*Awarded the *Nature Reviews Poster Prize*)
5th Symposium on Advanced Biological Inorganic Chemistry, January 2017, *Kolkata, India*.

Dhar, D.; Neisen, B. D.; Solntsev, P. V.; Tolman, W. B.
C-H Bond Activation by Synthetic Copper Oxygen Complexes
Bioinorganic Chemistry Headwaters Symposium, August 2014, *Minneapolis, USA.*

AWARDS

Nature Reviews Poster Prize at the 5th Symposium on Advanced Biological Inorganic Chemistry held in Kolkata (India) in January 2017.

Doctoral Dissertation Fellowship Award for the academic year 2016-2017 from the University of Minnesota.

Beaker and Bunsen Award for outstanding achievement in research and exemplary presentation at 2015 Graduate Research Symposium at University of Minnesota (Department of Chemistry).

Best Masters Research Project Award for M.Sc. Thesis at Department of Chemistry, Indian Institute of Technology Kanpur in 2011.

Academic Excellence Award from Indian Institute of Technology Kanpur in 2010.

University Gold Medal from University of Calcutta (India) and for securing the first rank in Chemistry (Honours) program for the academic session (2006-2009).

KVPY (Kishore Vaigyanik Protsahan Yojana) fellowship awarded by Government of India, which is a prestigious national scholarship for students interested in a research career in sciences for the period 2006-2011.

JBNSTS (Jagadis Bose National Science Talent Search) scholarship awarded to select students pursuing a career in pure and applied sciences in 2006.

Mamraj Agarwal Rashtriya Puraskar (2004) awarded by His Excellency the Governor of West Bengal for being among the top ten students placed in order of merit in India based on national board examinations.

MEMBERSHIPS

American Chemical Society