

Anand Kumar Gupta

Assistant Professor (self-finance)
Department of Chemistry
Digvijai Nath Post Graduate College, Gorakhpur,
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Education

- Ph.D.** in Organometallics and Palladium Catalysis **July 2010 – July 2016**
From Indian Institute of Technology, Bombay, Mumbai.
Thesis Advisor: Prof. H. B. Singh, **Thesis title:** Intramolecularly Coordinated Organochalcogen Compounds of N,C,N- and N,C-Pincer Ligands: Synthesis, Structure and Reactivity
- Master of Science** in Inorganic Chemistry [*first Division*] **Aug 2006 – July 2008**
From D.D.U. Gorakhpur, University Gorakhpur, UP
- Bachelor of Science** in Chemistry and Industrial Microbiology [*first Division*] **Aug 2002 – July 2005**
From D.D.U. Gorakhpur, University Gorakhpur, U.P.

List of Publications

A) Published articles in international journals with peer review process

- Gupta, A.,** Kumar, S., Singh, H. B. (2016): Structural and Reactivity Aspects of Organoselenium and Tellurium Cations. **Proc. Natl. Acad. Sci., India, Sect. A Phys.**, 86, 465-498, doi: 10.1007/s40010-016-0301-1.
- Gupta, A.,** Singh, H. B., Butcher, R. J. (2017): Crystal structure of {2,6-bis[(dimethylamino)methyl]phenyl-k3 N,C¹,N'}(bromido/chlorido)-mercury(II). **Acta Crystallogr., Sect. E**, 73, 1679-1682, doi:org/10.1107/S2056989017014682.
- Gupta, A.,** Singh, H. B., Butcher, R. J. (2017): 2,6-[Bis(dimethylamino)methyl]phenylselenenyl chloride/bromide monohydrate. **IUCrData**, 2, x171634, doi:10.1107/S2414314617016340.
- Singh, P., **Gupta, A.,** Sharma, S., Singh, H. B., Butcher, R. J. (2018): Synthesis and characterization of N,N',C-bound organotellurium(IV) and organomercury(II) derivatives. **Inorganica Chim. Acta**, 483, 218-228, doi:org/10.1016/j.ica.2018.08.016.
- Gupta, A.,** Deka, R., Raju, S., Singh, H. B., Butcher, R. J. (2019): Synthesis of intramolecularly coordinated heteroleptic diorganotellurides and diorganotelluroxides: Isolation of monomeric diorganotelluroxide [{2,6-(Me₂NCH₂)₂C₆H₃}₂TeO] and diorganohydroxytelluronium chloride [{2,6-(Me₂NCH₂)₂C₆H₃}₂Te(OH)]Cl. **J. Organomet. Chem.**, 894, 10-17, doi:10.1016/j.jorganchem.2019.05.003.
- Gupta, A.,** Deka R., Srivastava, K., Singh, H. B., Butcher, R. J. (2019): Synthesis of Pd(II) complexes of unsymmetrical, hybrid selenoether and telluroether ligands: Isolation of tellura-palladacycles by fine

tuning of intramolecular chalcogen bonding in hybrid telluroether ligands. **Polyhedron**, 172, 95-103, doi: 10.1016/j.poly.2019.03.036.

7. **Gupta, A.**, Deka, R., Singh, H. B., Butcher, R. J. (2019): Reactivity of bis[2,6-(dimethylamino)methyl]phenyl]telluride with Pd(II) and Hg(II): Isolation of the first Pd(II) complex of an organotellurenum cation as a ligand. **New J. Chem.**, 43, 13225-13233, doi:org/10.1039/C9NJ02469G.
8. **Gupta, A.**, Deka, R., Singh, H. B., Butcher, R. J. (2019): Oxidation behavior of intramolecularly coordinated unsymmetrical diorganotellurides: Isolation of novel tetraorganoditelluronic acids, [RR'Te(μ -O)(OH)₂]₂. **Dalton Trans.**, 48, 10979-10985, doi:org/10.1039/C9DT01926J.
9. Deka, R., Sarkar, A., **Gupta, A.**, Butcher, R. J., Junk, P. C., Turner, D. R., Deacon, G. B., Singh, H. B. (2020): Exploring the Role of Strong Intramolecular Coordination of 2-(2'-pyridyl)phenyl Group in Heavy Main Group Halides: Insights from Synthesis, Structural, and Bonding Analyses. **Eur. J. Inorg. Chem.**, 2020, 2143-2152, doi: 10.1002/ejic.202000094.
10. **Gupta, A.**, Deka, R., Singh, H. B., Butcher, R. J. (2020): Structural characterization of the derivatives of bis[2,6-(dimethylamino)methylphenyl]selenide with Pd(II) and Hg(II). **Acta Crystallogr. Sect. C** C76, 828-835, doi.org/10.1107/S2053229620010311.
11. **Gupta, A.**, Deka, R., Singh, H. B., Butcher, R. J. (2020): Structure of a diorganotelluroxonium(IV) cation, {[2,6-(CH₂NMe₂)₂C₆H₃Te(l-O)]₂}²⁺, with the trichlorido(dimethyl sulfoxide)platinum(II) anion. **Acta Crystallogr. Sect. E** E76, 1520-1524, doi.org/10.1107/S2056989020011482.
12. Deka, R., **Gupta, A.**, Sarkar, A., Singh, H. B., Butcher, R. J. (2020): Halogenation of Diorganotelluride [2,6-(Me₂NCH₂)₂C₆H₃]TeⁿBu: Synthesis, Molecular and Electronic Structural Investigation of Monoorgano Dihalotelluronium(IV) Cation. **Eur. J. Inorg. Chem.**, 2020, 4170-4179, doi: doi.org/10.1002/ejic.202000910.

B) Manuscript Under Preperation

1. "Isolation of a Telluroxane Cluster [(R₂TeO)(μ -TeO₂)(OTeR₂)]₂[TeO(OH)₂] (R=C₆H₅NNC₆H₄) Stabilized by Intra- and Intermolecular Secondary Bonding Interactions: Molecular and Electronic Structure Analysis. **Gupta, A.**, Deka, R., Singh, H. B., Butcher, R. J., manuscript submitted to **Polyhedron**.

Research Contribution

Research Associate at Department of Chemistry, Indian Institutes of Science Education and Research, Bhopal;

Feb 2017 – Mar 2017

Experience gained during my RAship stay in Prof. Sangeet Kumar lab designed new ligands and conducted catalysis.

Research Associate at Department of Chemistry, Indian Institute of Technology;

July 2016- Jan 2017

I worked as a research associate in the group of Prof. H. B. Singh. Research focus was synthesis and isolation of chiral C₂-symmetric organoselenium cations. We also have investigated the catalytic activities of synthesized organometallic complexes in diacetoxylation and halolactonization reactions.

Doctoral Researcher at Department of Chemistry, Indian Institute of Technology;

July 2010 – Oct. 2016

My research was directed towards the chemistry of *N,C,N/N,C/cis-C,N,N'*-pincer ligands has been explored focusing on; a) the synthesis of metal complexes of pincer ligands, b) telluronium cations, c) tellurenyl cations and d) telluroxanes. Applications of some telluroxanes in organic synthesis and biochemistry have also been investigated.

Experimental Skills

Synthetic Skills: Expertise in handling air and moisture sensitive reagents/reactions such as; Grignard reagent, n-butyl lithium, NaBH₄, TeCl₄, Na₂E₂ and Na₂E (E = S, Se, Te) using standard Schlenk-line/syringe-septa techniques. Design and synthesis of ligands and the corresponding metal complexes, purification and characterization of the compounds and the various techniques for their crystallization.

Spectroscopy: In operating and handling IR, UV-visible, fluorescence and NMR (400, 500 MHz). Analysis and interpretation of infrared, electronic, magnetic moment and NMR spectral data for the characterization of ligands and metal complexes

DFT calculations: Optimization of electronic structures using Gaussian 09, NBO analysis and AIM studies of ligands and metal complexes and expertise with crystallographic programs such as ORTEP, Diamond and Mercury.

Laboratory Experiences

Department of Chemistry, Digvijai Nath Post Graduate College, Gorakhpur

Aug 2018 – Present

Experience gained during my present post

- Preparation of organic compounds involving two and three steps
- Qualitative analysis of an inorganic mixture of cations and anions
- Gravimetric estimation of two metal ions from mixtures

Department of Chemistry, Indian Institute of Technology, Mumbai, India

July 2010 – Jan 2017

Experience gained during my Ph.D. and six months' research associate period in Prof. Singh's lab

- Bruker 400 (400 MHz) NMR spectrometer
- Bruker 500 (500 MHz) NMR spectrometer
- ThermoNocolet Avatar 320 FT-IR spectrometer
- Q-TOF micro (YA-105) micromass spectrometer
- JASCO V-570 UV-visible spectrophotometer
- Experience with Electronic Structure theory calculations using Gaussian, AIM2000, NBO, Multiwfn etc software
- Analysis using Cambridge Crystallographic Data Center (CCDC) database

Awards/Fellowship/National level examinations

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| Sept 2015 – Mar 2016 | Financial support for PhD Scholarship from The Industrial Research and Consultancy Center (IRCC), IIT Bombay |
| July 2012 – Aug 2015 | Senior Research Fellowship from the Council of Scientific and Industrial Research (CSIR)-India. |
| July 2010 – July 2012 | Junior Research Fellowship from the University Grand Commission (UGC)-India. |
| Dec 2009 | National level test for Junior Research Fellowship and Lectureship, conducted jointly by (CSIR)-India and University Grand Commission (UGC)-India. |
| June 2009 | National level test for Lectureship, conducted jointly by (CSIR)-India and University Grand Commission (UGC)-India (All India Rank-183). |

Teaching Experience and Guiding Students

Assistant Professor, Digvijai Nath P.G. College, Gorakhpur

Aug 2018-present

As a teacher, I would like to devise captivating, fascinating, and unique practices of teaching that creates interest in the students. My interpersonal skills coupled with my cordial nature helps to build good rapport with students. Major Courses I thought:

- Symmetry and Group Theory
- Coordination Chemistry
- Organometallics Chemistry
- Spectroscopy

CH103T Inorganic Tutorial B. Tech. IIT Bombay

2012-2013

Worked as a teaching assistant for the 'Inorganic Chemistry' course for Undergraduate students. This course includes chemical bonding, VSEPR theory, coordination, organometallics, bioinorganic and metallurgy etc.

CH117L Advanced Chemistry Lab, B. Tech. IIT Bombay

2011-2012

as a teaching assistant for the 'Laboratory' course for Undergraduate students. Experiments illustrating the concepts of

(1) galvanic cells (2) thermochemistry, (3) chemical kinetics, (4) equilibrium constant, (5) redox titration

Students Supervised

I have guided few students for M.Sc. project and undergraduate project during my Ph.D. tenure.

Rajesh Deka (Assisted **Ph.D.**), Lakshmi Narayanan (**M. Sc.**), Nabhendu Pal (**M. Sc.**), Sudeep Chaurasia (**M. Sc.**)

Conferences, Poster and Oral Presentation

1. Chemical Research Society of India (CRSI), IIT Bombay **2014**
2. Modern Trends in Inorganic Chemistry (MTIC), (Oral Presentation) IIT Roorkee **2013**
3. In House Conference (Poster Presentation) IIT Bombay **2011**

Organizing Scientific Meetings

I was the part of the organizing team of an international webinar and open day activities at Digvijai Nath P.G. College, Gorakhpur. e.g. Survival With Covid-19.