


DR. DIPAK KUMAR HAZRA

Assistant Professor
Department of Physics
Egra Sarada Shashi Bhusan College
Egra, Purba Medinipur

 dipakhazra@gmail.com

 : (+91) 7278427345



EDUCATION:

2012-2015	Research Associate (Post-Doc) Department of Solid State Physics Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India.
2012	Ph.D. in Science (Degree awarded by Jadavpur University) Department of Solid State Physics Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India.
2003	M.Sc. in Physics from Jadavpur University, Kolkata, India
2001	B.Sc. (Hons) in Physics from Vidyasagar University, Medinipur (W), India.

TEACHING EXPERIENCE:

- One PG students has completed M.Sc. final year project under my supervision at Egra SSB College under Vidyasagar University
- Working as an Assistant Professor in the Department of Physics at Egra Sarada Shashi Bhusan College Egra, Purba Medinipur under V.U. since 28th April, 2022 – till date.
- Worked as an Assistant Professor in the Department of Physics at Uluberia College, Uluberia, Howrah under University of Calcutta from 18th March, 2015-27th April, 2022.
- Taking classes in M.Sc. 2nd year at the Post Graduate Department of Mathematics, Uluberia College in the session 2016-17 and 2017-18.

- Worked as a guest lecturer in the Department of Physics at Vivekananda Mission Mahavidyalaya, Chaitanya Pur, Haldia, V.U. about 2 years.

FELLOWSHIPS /AWARDS AND PROFESSIONAL EXPERIENCES:

- University Gold medal for the 1st rank in B.Sc. (Hons) .
- Dr. N.C. Rana Gold Medal for the highest mark in Physics (Hons).
- National Scholar, Govt. of West Bengal.
- Reviewer of Journal of Molecular Structure.
- Life member of Indian Association for the Cultivation of Science
- Member of the Indian Crystallographic Association (ICA).
- Qualified in National Eligibility Test (NET) Examination.
- Senior research fellowship, Indian Association for the Cultivation of Science, India, April 2009- 2012.
- Junior research fellowship, Indian Association for the Cultivation of Science, India, 2007-2009.

SUMMARY OF RESEARCH:

My PhD work comprises of three parts, - (I) single crystal structural analyses of molecular materials, (II) *Ab-initio* structure determination of organic from laboratory X-ray powder diffraction data and (III) accurate charge density study using high resolution X-ray diffraction data.

RESEARCH INTEREST:

Chemical crystallography; Crystal Engineering; Accurate Charge density study; *Ab-initio* structure determination from X-ray powder diffraction data; Rietveld Refinement; Qualitative and quantitative phase analysis and Microstructural analysis; Neutron diffraction; Nanostructure; Electron crystallography; Computational chemistry. DFT study.

SKILLS:

- [1] Expert of XD program for X-ray Charge Density Analysis.
- [2] Experience in data collection, indexing and application of single crystal X-ray diffractometer (BRUKER SMART APEX-II) as well as powder X-ray diffractometer (BRUKER D8 ADVANCE).
- [3] Expert of structure determination of organic compounds and metallic-organic complexes using single/powder crystal X-ray diffraction data.

- [4] Expertise in the use of GSAS for Rietveld refinement. Possess knowledge of the MAUD program for microstructure analysis and quantitative phase analysis.
- [5] Familiar with the application of Cambridge Structural Database and the packages (Conquest, Mogul, Vista, Mercury) included therein.
- [6] Have used DMOL³ programs in Material Studio package to perform geometry optimization and single point energy calculations based on Density Functional Theory.
- [7] EXPO, DASH, FOX, CrystalExplorer · have been used for powder data indexing, Structure Solution and Electrostatic potentials mapped on Hirshfeld surfaces and Intermolecular Interaction energies.

PUBLICATIONS:

PAPER ACCEPTED/CONTRIBUTED/COMMUNICATED AT JOURNALS:

1. **Interpretation of intermolecular interaction by experimental charge density analysis**
Dipak K. Hazra
 NeuroQuantology 20 (2022) 4189-4196.
2. **X-ray powder diffraction: problems and prospects**
Dipak K. Hazra
 IJRAR 6 (2019) 91-100.
3. **Weak inter molecular interactions: crystal structure and Hirshfeld surface analysis**
Dipak K. Hazra
 JETIR 6 (2019) 36-41
4. **Heterometallic Metal–Organic Frameworks That Catalyze Two Different Reactions Sequentially**
 Debraj Saha, Dipak K. Hazra, Tanmoy Maity and Subratanath Koner
 Inorg. Chem., 2016, 55 (12), pp 5729–5731
5. **Two carbamate derivatives with Z'=2 and 3: An interplay of strong and weak hydrogen bonds**
 Uday Das, Basab Chattopadhyay, Dipak K. Hazra, Vommina V. Sureshbabu, Alok K. Mukherjee
 Journal of Molecular Structure, 1122 (2016) 290–298.
6. Hydrated potassium cluster based 2d coordination polymer of β -[Mo₈O₂₆]⁴⁻ : Design of a supramolecular system with two counter cations.

Rajarshi Chatterjee, Dipak K. Hazra, Partha Sarathi Singha

B.N. SEAL JOURNAL OF SCIENCE, 3 (2015) 37-46, Issue: 1, September-2015, ISSN: 0975-5624

7. C-H...O and C-H...X (X=Cl/Br) hydrogen bond tuned supramolecular assembly: A combined X-ray powder diffraction and Hirshfeld surface analysis

Dipak K. Hazra, Soumen Ghosh, Paramita Chatterjee, Somnath Ghosh, Monika Mukherjee and Alok K. Mukherjee

Powder Diffraction 29 (3), 2014, 280-288.

8. A cyanide selective off-on fluorescent chemo sensor with in vivo imaging in 100% water: solid probe preferred over in situ generation.

S. Das, S. Biswas, S. Samanta, I. Bhowmick, D. K. Hazra, A. Roy, and P.P.Pradhan

RSC Adv. 4 (2014) 9656-9659. **IF=3.9**

9. Encapsulation of a double-helical water-nitrate chain inside a unique double helical chiral channels formed from Keggin POM and hexaquo-cobalt(II) units.

Rajarshi Chatterjee, Luna Paul, Dipak K. Hazra, Nabanita Pal, Atish D Jana, Monika Mukherjee and Mahammad Ali

Polyhedron 68 (2014) 265-271.

10. In situ solid state polymerization and characterization of poly (N-vinylcarbazole) encapsulated Keggin type polyoxometalate nanocomposite

Dipak K. Hazra and Rajarshi Chatterjee (As corresponding author)

Journal of Molecular Structure 1045(2013) 139–144.

11. Ab initio powder structure analysis and theoretical study of two thiazole derivatives

Dipak K. Hazra, Monika Mukherjee and Alok K. Mukherjee

Journal of Molecular Structure 1039(2013) 153–159.

12. 18-Crown-6 ether templated transition-metal dicyanamido complexes: Synthesis, structural characterization and DFT studies

Dipak K. Hazra, Monika Mukherjee, Rupam Sen, Debraj Saha, Subratanath Koner and Alok K. Mukherjee

Journal of Molecular Structure 1033 (2013) 137–144.

13. Hydrothermal synthesis and characterization of bis(4,4'-bipyridinium)dodecatungstosilicate dihydrate

Rajarshi Chatterjee, Dipak K. Hazra, Monika Mukherjee, M. Nethaji and Mahammad Ali

Indian Journal of Chemistry, 52A (2013)749-752.

14. 2,4-Dimethyl-1,3-thiazole-5-carboxylic acid: an X-ray structural study at 100 K and Hirshfeld surface analysis

Dipak K. Hazra, Monika Mukherjee, Madeleine Helliwell and Alok K. Mukherjee

Acta Cryst. (2012). C68, o452–o455. (Selected as Cover page and IUCR News letter)

15. Crystal structure and electronic properties of a piroxicam derivative: A combined X-ray analysis and quantum mechanical studies

Soumen Ghosh, Dipak K. Hazra, Basab Chattopadhyay, Sarbani Pal, Madeleine Helliwell, Alok K. Mukherjee

J Chem Crystallogr (2012) 42:1067–1074.

16. Topological features and electronic structure of 4-chloro-1H-pyrrolo [2,3-b]pyridine: experimental charge density and DFT studies.

Dipak K. Hazra, Alok K. Mukherjee, Madeleine Helliwell, Monika Mukherjee.

CrystEngComm, 14 (2012) 993–1000.

17. Self-assembly of 1D coordination polymers of two rare-earth complexes with carboxylate linkages: Synthesis, crystal structure and DFT studies.

Dipak K. Hazra, Rupam Sen, Subratanath Koner, Madeleine Helliwell, Monika Mukherjee.

Polyhedron 30 (2011) 2195–2202.

18. Gd₂₆ Cluster Consisting of Distorted Cubane Cores: Synthesis, Structure and Heterogeneous Catalytic Epoxidation of Olefins.

Rupam Sen, Dipak K. Hazra, Monika Mukherjee, Subratanath Koner.

European Journal of Inorganic Chemistry 2011 (2011) 2826–2831.

19. Heterogeneous Catalytic Epoxidation of Olefins Over Hydrothermally Synthesized Lanthanide Containing Framework Compounds.

Rupam Sen, Subratanath Koner, Dipak K. Hazra, Madeleine Helliwell, Monika Mukherjee.

European Journal of Inorganic Chemistry 2011 (2011) 241–248. (Appeared as Hottest article in Inorganic Chemistry)

20. 4-(3,5-Dimethyl-1H-pyrazol-4-ylmethyl)-3,5-dimethyl-1Hpyrazol-2-ium dihydrogen phosphate: a combined X-ray and DFT study.

Dipak K. Hazra, Rajarshi Chatterjee, Mahammad Ali, Monika Mukherjee.

Acta Cryst. C66 (2010) o190–o193.

21. Hydrothermal synthesis of dimeric lanthanide compounds: X-ray structure, magnetic study and heterogeneous catalytic epoxidation of olefins.

Rupam Sen, Dipak K. Hazra, Subratanath Koner, Madeleine Helliwell, Monika Mukherjee, Ashis Bhattacharjee.

Polyhedron 29 (2010) 3183–3191.

22. Synthesis, crystal structure and DFT studies of 3,4-bis-(2-chloro-phenyl)-2-oxa-bicyclo [2.2.1] heptan-6-one.

Dipak K. Hazra, Monika Mukherjee, Subodh Kumar.

Journal of Molecular Structure 920 (2009) 114–118.

23. Synthesis, spectroscopic characterization and X-ray structure analyses of two uranyl complexes.

Dipak K. Hazra, Subhajit Dinda, Madeleine Helliwell, Ramgopal Bhattacharyya, Monika Mukherjee.

Zeitschrift für Kristallographie, 224 (2009) 544-550.

24. Synthesis, structural elucidation and DFT studies of ortho-hydroxy acetophenones.

Saikat K. Seth, Dipak K. Hazra, Monika Mukherjee, Tanusree Kar.

Journal of Molecular Structure 936 (2009) 277–282.

25. Reductive thiocyanalysis of tetraoxorhenate (VII): Synthesis, crystal structure, catalytic oxidation and kinetic studies of $(PPh_4)_2[Re(NCS)_6]$ and $(PPh_4)_2[ReO(NCS)_5]$.

Subhajit Dinda, Dipak K. Hazra, Sujoy RoyChowdhury, Madeleine Helliwell, K.M. Abdul Malik, Monika Mukherjee, Ramgopal Bhattacharyya.

Inorganica Chimica Acta 362 (2009) 2108–2116.

Book Chapter

Dipak K. Hazra, “Interplay of weak hydrogen bond in four heterocyclic compounds: a combined X-ray powder diffraction and Hirshfeld surface analysis”. pp. 64-79, in “*The Importance of Intermolecular Interactions in Solid-State X-Ray Crystal Structures*”, Editor: S. Seth, New Academic Publishers, New Delhi. 2016.

PAPER /ORAL PRESENTED IN SYMPOSIA, CONFERENCE ETC.

[1] PAPER ENTITLED “STRUCTURAL AND MICROSTRUCTURAL CHARACTERIZATION OF HUMAN KIDNEY AND GALL-BLADDER STONES USING X-RAY POWDER DIFFRACTION” IN International Conference ICSTM2023.

[2] PAPER ENTITLED “CRYSTAL ENGINEERING: SMALL MOLECULE TO PHARMACEUTICAL COMPOUNDS” IN NATIONAL SEMINAR ORGANIZED BY DEPT. OF CHEMISTRY AND ZOLLOGY

[3] “Two days Hands-on-Training Programme on Powder Diffraction & Rietveld refinement” organized by Dept. of Physics in association with Coastal Environmental Studies Research Centre of Egra SSB College held on the 1⁵th & 1⁶th May, 2023.

[4] Participate in Two Day National Level Workshop on Advanced Nano Therapeutics organized by School of Life Sciences, Uluberia College, Howrah. 2017

[5] Participate in Two Day National Level Workshop on Advanced Nano Therapeutics organized by School of Life Sciences, Uluberia College, Howrah. 2017

[6] Attend the workshop on perfect pipetting techniques and cleaning procedures organized by School of Life Sciences, Uluberia College, Howrah. 2015

[7] Participate in UGC sponsored National Seminar on Recent Trends on Pure and Applied Mathematics, organized by Dept. of Mathematics, Uluberia College, Howrah. 2017

[8] Interplay of weak hydrogen bond in four heterocyclic compounds: a combined X-ray powder diffraction and Hirshfeld surface analysis.
UGC sponsored National Seminar, 7-8th September, 2015, Department of Physics of Mugberia Gangadhar Mahavidyalaya, Purba Medinipur.

[9] **Experimental charge density and topological analysis of 4-chloro-7-azaindole.**
(Poster)

Dipak K. Hazra, Monika Mukherjee

FOUNDATION DAY PROGRAMME, JULY 29, 2010, IACS, JADAVPUR, INDIA.

[10] **Crystal structure and DFT studies of 3, 4-bis-(2-chloro-phenyl)-2-oxa-bicyclo [2.2.1] heptan-6-one.** (Poster)

Dipak K. Hazra, Monika Mukherjee

38TH NATIONAL SEMINAR ON CRYSTALLOGRAPHY, FEBRUARY 11-13, 2009, DOS IN GEOLOGY, UNIVERSITY OF MYSORE, MYSORE, INDIA.

[11] **Crystal structures of merohedrally twinned pentaisothiocyanatoxrorhenium and hexaisothiocyanatorhenium complexes).**
(Poster)

Dipak K. Hazra, Monika Mukherjee.

37TH NATIONAL SEMINAR ON CRYSTALLOGRAPHY, FEBRUARY 6-8, 2008, DEPARTMENT OF PHYSICS, JADAVPUR UNIVERSITY, KOLKATA, INDIA.