

# **Dr. Sanjib Ganguly (Ph.D)**

**Associate Professor (Inorganic Chemistry)**

**Department of Chemistry**

**St. Xavier's College (Autonomous), Kolkata**

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## **Academic Background:**

**Graduation:** *Presidency College, Kolkata*

**Post-Graduation:** *Science College (Calcutta University)*

**Ph. D.:** *IACS, Kolkata* (under the supervision of *Prof. Animesh Chakravorty*)

## **Teaching Experience:**

Under-graduate: 23 years

Post-graduate: 14 years

Ph. D. Course-work: 2 years

## **Areas of Research Interest:**

Metal mediated chemical transformation

Spin-state interaction of redox sensitive coordination moieties.

Coordinated radicals: Stabilization & Electron Transfer Pathways

Transition metal complexes as anti-microbials

## **Research Group:**

**Current Ph. D student:** Gopal Kanrar, Aratrika Samajdar

**Current Project student:** Arup Sarkar, Alok Apan Swatiputra, Debarjun Mukherjee

**Past Ph. D. Student:** Dr. Shuvam Pramanik, Dr. Soumitra Dinda

## Research Projects Undertaken:

| Granting Agency with<br>Ref. No. & Date<br>(Ongoing/Completed)                                | Title of the Project   | Duration                   | Research<br>scholars<br>provided | Amount in<br>Rs. |
|---|--|----------------------------|----------------------------------|------------------|
| UGC Minor Research<br>Grant<br>(COMPLETED)  | Hetero-polymetallated<br>Radical Complexes:<br>Synthetic, Structural,<br>Spectral and Magnetic<br>Studies  | 2009-2011<br>(1.5 years)   | NIL                              | 1,17,000         |
| UGC Major Research<br>Grant<br>Reference No. & Date: F.<br>No. 42-248/2013(SR)<br>(COMPLETED) | Synthesis, Structure,<br>Spectral, Theoretical Study<br>and Exploration of<br>Reactivity of Transition<br>Metal Complexes with<br>ligands containing azo group<br>in conjunction with other<br>function. | 2013–<br>2015<br>(2 years) | NIL                              | 4, 48,000        |
| WBDST Grant No.<br>683(Sanc.)/ST/P/S&T/4G-<br>11/2014<br>(COMPLETED)                          | Mono and Polynuclear<br>Complexes with $\pi$ -acidic<br>Oximato Function:<br>Synthesis and Spectral,<br>Electrochemical, Theoretical<br>& Reactivity Study   | 2016–<br>2019<br>(3 years) | ONE (1)                          | 12.78,000        |
| Intramural Grant from St.<br>Xavier's College<br>(Autonomous), Kolkata<br>(ONGOING)           | Exploration of the role of<br>inexpensive catalyst using<br>3d-complexes of novel<br>redox non-innocent ligands<br>for synthesis of C–C bonds<br>and N-hetero-cycles.                                    | 2023-2025<br>(2 years)     | NIL                              | 3,00,000         |

## Presentations in Symposia, Conferences & Workshops

1. **Resource Person** in the International webinar on *“Impact of Covid-19 on education at institutions of higher education across the globe”* on 25<sup>th</sup> April, 2022 organized by Central Connecticut State University, USA.
2. Delivered an *online Lecture* in the *Faculty Development Programme (FDP)* on *“Bioinorganic Chemistry”* on 30<sup>th</sup> September, 2021 organized by the **DBT Star College Scheme**, St. Xavier’s College (Autonomous), Kolkata.
3. Delivered an *online Lecture* on *“Redox Principles in certain Chemical & Biochemical Reactions”* for under-graduate students of Chemistry on 3<sup>rd</sup> August, 2021, organized by the Department of Chemistry, Birati College (Mrinalini Dutta Mahavidyapith)
4. **Resource Person** in UGC CPE funded State Level Workshop on *“Analytical Techniques for Biological Research”* on February 16, 2020 at the **BRSN College**
5. **International Conference RACBC-2020** at St. Xavier’s College, Kolkata January 10, 2020. **(ORAL PRESENTATION)**
6. **Popular Lecture** on *“Intriguing Metal Mediated Organic Transformation”*, February 2020 at the **Surendranath College, Kolkata**
7. International Conference on **Modern Trends in Inorganic Chemistry (MTIC)-2019** at **IIT Guwahati, December 11, 2019. (ORAL PRESENTATIONS)**
8. **Popular Lecture** on *“Role of Periodic Table in Biological Research”* organized by the **Royal Society of Chemistry** at the Birla Science Museum on *November 30 2019*.
9. **Resource Person** in UGC CPE funded State Level Workshop on *“Refreshing Chemistry for Biologist”* on *December 14, 2017* at the **BRSN College**.
10. **Asian Meeting on Metal Oxide Assemblies (AMMOA 2017)**, *May 9-10, 2017* at **IISER, Kolkata. (ORAL PRESENTATIONS)**
11. National Seminar on Emerging Trends in Chemistry (**ETC- 2017**), *February 15, 2017. (POSTER PRESENTATION)*

12. *International Symposium on Advanced Biological Inorganic Chemistry, SABIC- 2017, January 7-11, 2017* organized jointly by IACS & NCL, Pune (**ORAL PRESENTATION**)
13. *International Symposium on Modern Trends in Inorganic Chemistry- XVI (MTIC- XVI), December 3-5, 2015* at the **Jadavpur University**, Kolkata. (**POSTER PRESENTATION**)
14. *International Conference on Structural Chemistry of Molecules and Materials, SCOMM-2014, November 30- December 2, 2014* at Centre for Research in Nanoscience and Nanotechnology (CRNN), University of Calcutta. (**POSTER PRESENTATION**)

### **Convener/ Coordinator in Symposia**

- Convener of the Professional Scientific Development Programme **PSPD 2022** organized by St. Xavier's College (Autonomous), Kolkata, *November 23<sup>rd</sup> - 30<sup>th</sup>, 2022*
- **Convener** of the "National Symposium on Modern Research Trends in Chemistry, **MRTC-2019**", *February 22-23, 2019* at the St. Xavier's College, Kolkata (jointly with the Royal Society of Chemistry, Eastern India Section)
- **Convener** of the "International Symposium on Chemistry in Modern day Cancer Research, **CMCR-2019**", *January 8<sup>th</sup>, 2019* at the St. Xavier's College, Kolkata
- **Convener** of the "International Symposium on Chemistry & its Role in Environmental Biology, **CREB-2018**", *June 20<sup>th</sup>, 2018* at the St. Xavier's College, Kolkata
- **Convener** of the "National Symposium on Facets of Chemistry in Materials & Biology, **FOCMB-2018**", *February 16- 17, 2018* at the St. Xavier's College, Kolkata
- **Convener** of the "International Symposium on Facets of Chemistry in Biology, **FOCB- 2017**", *January 12<sup>th</sup>, 2017* at the St. Xavier's College, Kolkata
- **Convener** of the "National Symposium on Facets of Chemistry in Biology, **FOCB-2016**", *February 22- 23, 2016* at the St. Xavier's College, Kolkata

### **Awards & Recognitions:**

1. **Bursary Grant** for attending 24<sup>th</sup> **IUCr Congress and General Assembly** in Hyderabad in 2017
2. **CSIR NET** fellowship in 1995 for pursuing Ph. D.
3. **GATE** conducted by IIT1995 (98.85 percentile, AIR: 21)

### **List of Research Publications in peer reviewed journals:**

1. Role of ligand disposition and oxime... oximate hydrogen bonding upon redox non-innocent character of rhodium (III) phenylazooximates: S. Naskar, S. Halder, G. Kanrar, D. Jana, S. Dinda, K. Pramanik\* and **Sanjib Ganguly\***  
*Polyhedron*, **2023**, 235, 116342. (**Impact Factor: 2.975**)
2. Electrocatalytic Nitrogen Reduction Reaction (NRR) A Probable Alternative to Haber-Bosch Process (HBP): J. Basu and **Sanjib Ganguly\***  
*Resonance*, **2023**, 28, 279-291. (**Impact Factor: 0.21**)
3. Molecular and Electronic Structures, Spectra, Electrochemistry and Anti-bacterial Efficacy of Novel Heterocyclic Hydrazones of Phenanthrenequinone and Their Nickel (II) Complexes: S. Dinda, D. Maitra, B. Roy, P. Khan, A. Samajdar, Arup Kumar Mitra, S. Roy, A. Mondal, K. Pramanik\* and **Sanjib Ganguly\***  
*ChemistrySelect*, **2022**, (34), e202202151 (**Impact Factor: 2.307**)
4. Azo-oximate metal-carbonyl to metalcarboxylic acid via the intermediate Ir(III) radical congener: quest for co-ligand driven stability of open- and closed-shell complexes:  
S. Dinda, S. Pramanik, J. Basu, S. C. Patra, K. Pramanik\* and **Sanjib Ganguly\***  
*Dalton Trans.*, **2022**, 51, 10121-10135. (**Impact Factor: 4.569**)
5. A perspective on exploration of synthetic reaction pathways of stable metalcarboxylic acids and structural features of MCOOH moiety: S. Pal, S. Dinda, **Sanjib Ganguly\***  
*J. Organomet. Chem.*, **2022**, 968-969, 122355 (**Impact Factor: 2.345**)
6. Diarylazooxime complex of cobalt(III): synthesis, structure, ligand redox, DFT calculations and spectral characteristics: Soumitra Dinda, Koushik Sarkar, Bikash Kumar Panda, K. Pramanik\* & **Sanjib Ganguly\***  
*Transition Metal Chemistry*, **2022**, 47, 31–38 (**Impact Factor: 2.266**)
7. An insight into the coordination specificity of polyaromatic hydrocarbons (PAHs) grafted hydrazones towards rhodium(III): S. Dinda, S. Naskar, S. Roy, K. Pramanik\* and **Sanjib Ganguly\***  
*Polyhedron* **2021**, 205, 115318 (**Impact Factor: 2.975**)
8. Coligand driven diverse organometallation in benzothiazolyl-hydrazone derivatized pyrene: ortho vs. peri C–H activation  
S. Dinda, S. C. Patra, S. Roy, S. Halder, T. Weyhermüller, K. Pramanik\*, **Sanjib Ganguly\***

- New J. Chem.* **2020**, 44, 1407-1417 (**Impact Factor: 3.925**)
9. Ruthenocycles of benzothiazolyl and pyridyl hydrazones with ancillary PAHs: Synthesis, structure, electrochemistry and antimicrobial activity  
S. Dinda, T. Sultana, S. Sultana, S. C. Patra, A. Mitra, S. Roy, K. Pramanik\*, **Sanjib Ganguly\***  
*New J. Chem.* **2020**, 44, 11022-11034 (**Impact Factor: 3.925**)
10. Rhodium assisted peri-C–H activation in benzothiazolyl-hydrazone derivatized pyrene  
S Dinda, SC Patra, T Samanta, A Basu, K Pramanik\*, **Sanjib Ganguly\***  
*Polyhedron* **2020**, 179, 114352 (**Impact Factor: 2.975**)
11. Polyaromatic hydrocarbon derivatized azo-oximes of cobalt (iii) for the ligand-redox controlled electrocatalytic oxygen reduction reaction  
S Dinda, S Roy, SC Patra, S Bhandary, K Pramanik\*, **Sanjib Ganguly\***  
*New J. Chem.* **2020**, 44, 3737-3744 (**Impact Factor: 3.925**)
12. Rhodium(III) complex with pyrene-pyridyl-hydrazone: synthesis, structure, ligand redox, spectral characterization and DFT calculation.  
*J. Chem. Sci.* **2019**, 131(3), 24 (doi.org/10.1007/s12039-019-1598-5) (**Impact Factor: 2.150**)  
Soumitra Dinda, Sarat Chandra Patra and **Sanjib Ganguly\***
13. Synthesis, X — ray crystal structure, DFT calculations, spectroscopic characterization and redox behaviour of a rhodium(III) complex of an anthracene–pyridylhydrazone ligand.  
*Transition Met. Chem.* **2019**, 44, 0000 (doi.org/10.1007/s11243-018-00300-4) (**Impact Factor: 2.266**)  
Soumitra Dinda, Sarat Chandra Patra, Bikash Kumar Panda and **Sanjib Ganguly\***
14. Ambient-Stable Bis-Azoaromatic-Centred Diradical [(L•)M(L•)] Complexes of Rhodium(III): Synthesis, Structure, Redox and Spin-Spin Interaction  
*Inorg. Chem.* **2017**, 56(21), 12764-12774. (**Impact Factor: 5.436**)  
Sima Roy, Shuvam Pramanik, Sarat Chandra Patra, Basab Adhikari, Abhishake Mondal, **Sanjib Ganguly** and Kausikisankar Pramanik\*
15. Luminescent Closed Shell Nickel(II) Pyridyl-azo-oximates and the Open Shell Anion Radical Congener: Molecular and Electronic Structure, Ligand Redox and Biological Activity  
*New. J. Chem.*, **2017**, 41, 4157-4164. (**Impact Factor: 3.925**)  
Shuvam Pramanik, Suhana Dutta, Sima Roy, Soumitra Dinda, Tapas Ghorui, Arup Kumar Mitra, Kausikisankar Pramanik and **Sanjib Ganguly\***
16. Iridium(III) Mediated Reductive Transformation of Closed-Shell Azo-oxime to Open-Shell Azo-

imine Radical Anion: Molecular and Electronic Structure, Electron Transfer and Optoelectronic Properties"

*Inorg. Chem.*, **2016**, 55(4), 1461-1468. (Impact Factor: 5.436)

Shuvam Pramanik, Sima Roy, Tapas Ghorui, Kausikisankar Pramanik and **Sanjib Ganguly\***

17. Molecular and electronic structure of nonradical homoleptic pyridyl-azo-oxime complexes of cobalt(III) and the azo-oxime anion radical congener: an experimental and theoretical investigation

*Dalton Trans.*, **2014**, 43, 5317. (Impact Factor: 4.569)

Shuvam Pramanik, Sima Roy, Tapas Ghorui, **Sanjib Ganguly\*** and Kausikisankar Pramanik

18. Oximate Bridged Hetero-binuclear  $Ru^{III}M^I$  Complexes (M = Cu, Ag)

*J. Ind. Chem. Soc.*, **2012**, 89, 107. (Impact Factor: 0.729)

**Sanjib Ganguly**

19. Trinuclear  $Ru^{III}-Mn^{II}-Ru^{III}$  Complexes incorporating azo-oxime function

*J. Ind. Chem. Soc.*, **2010**, 87, 1299. (Impact Factor: 0.729)

Indranil Bhattacharyya and **Sanjib Ganguly\***

20. Oximate bridged  $Rh^{III}M_2^{II}$  and  $Rh^{III}M^I$  species ( $M^{II} = Mn, Co, Ni$ ;  $M^I = Cu, Ag$ )

*J. Chem. Sci.*, **2008**, 120, 87. (Impact Factor: 2.150)

Indranil Bhattacharyya, **Sanjib Ganguly**, Bikash Kumar Panda and Animesh Chakravorty.

21. Planar four coordinate nickel(II) complexes of tridentate ligands incorporating azo,- oxime-carboxyl chelation: synthesis and structure.

*J. Ind. Chem. Soc.*, **2005**, 82, 898.

**Sanjib Ganguly** and Soma Karmakar

22. Azo-oxime-carboxylates of bivalent platinum

*J. Ind. Chem. Soc.*, **2004**, 81, 327.

**Sanjib Ganguly**

23. A very rare mononuclear nickel(II) species bonded via oxygen atom of oximate function using pyridyl-azo-oxime type of ligands

*J. Ind. Chem. Soc.*, **2002**, 79, 271.

Chandan Kumar Pal and **Sanjib Ganguly\***

24. Synthesis, structure and reactivity of palladated azo-oxime-carboxylates.

*Indian J. Chem.*, 2001, 40A, 90.

Chandan Kumar Pal, Soma Mukherjee (Karmakar) and **Sanjib Ganguly\***

25. Synthesis and Structure of Silver Azo-oximates. Hydrogen Bonding and Non-bonded Ag...Ag Interactions.

*Inorg. Chem.*, 2000, 39, 2954. (**Impact Factor: 5.436**)

**Sanjib Ganguly**, Surajit Chattopadhyay, Chittaranjan Sinha and Animesh Chakravorty

26. Regiospecific Oximato-O coordination at the oxygen site: Ligand Design and Low-spin Mn<sup>II</sup> and Fe<sup>II/III</sup> Species.

*Inorg. Chem.* 1999, 38, 5984. (**Impact Factor: 5.436**)

**Sanjib Ganguly**, Soma Karmakar, Chandan Kumar Pal and Animesh Chakravorty

27. A New Family of Acylrhodium Organometallics.

*Organometallics*, 1999, 18, 1486. (**Impact Factor: 3.837**)

Sujay Pattanayak, Swarup Chattopadhyay, Kaushik Ghosh, **Sanjib Ganguly**, Prasanta Ghosh and Animesh Chakravorty.

28. Synthesis and structural studies of cobalt complexes of tridentate ligands incorporating azo, oxime and carboxylate functions.

*Indian J. Chem.*, 1999, 38A, 335.

**Sanjib Ganguly** and Soma Karmakar

29. Synthesis and structure of bis azooximes of dichlororhodium(III): the oxime...oximato OH...O bridge and effect of its deprotonation.

*J. Chem. Soc., Dalton Trans.* 1998, 461. (**Impact Factor: 4.569**)

**Sanjib Ganguly**, Vadivelu Manivannan and Animesh Chakravorty.

30. Azo oximes of bi- and tri-valent Nickel

*J. Chem. Soc., Dalton Trans.* 1997, 585. (**Impact Factor: 4.569**)

Soma Karmakar, Suranjan Bhanja Chowdhury, **Sanjib Ganguly** and Animesh Chakravorty

31. First examples of carboxyl-bonded low-spin Mn(III) complexes

*Inorg. Chem.*, 1997, 36, 116. (**Impact Factor: 5.436**)

**Sanjib Ganguly**, Soma Karmakar and Animesh Chakravorty