

Dr. Partha Samanta, PhD

Postdoctoral Researcher

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Research Interests & Highlights:

- Synthesis and characterization of porous functional metal-organic frameworks (MOFs), covalent organic frameworks (COFs) and porous organic polymers (POPs) for a wide range of applications on demand.
- Design and fabrication of heterogeneous catalysts based on porous materials like porous organic polymers (POPs) and metal-organic frameworks (MOFs) for efficient and recyclable heterogeneous catalysis.
- Development of porous materials for clean energy and environment applications which includes CO₂ capture, proton conduction studies for fuel cell applications etc.
- Remediation of water pollution by scavenging hazardous and toxic pollutants with target specific porous materials.
- Selective sensing of toxic analytes with MOFs and POPs for therapeutic and environmental applications.
- Host-guest chemistry including molecular recognition, self-assembly and structure-function correlation.

Positions & Education:

Mar'2023- Current Institut Català de Nanociència i Nanotecnologia (ICN2) **Postdoctoral researcher**

Project Investigator: **Dr. Daniel MasPOCH (ICN2)**

Research topic: Clip-off chemistry in metal-organic frameworks (MOFs)

Nov'2019-Dec'2022 Institut de recherches sur la catalyse et l'environnement (IRCELYON) **Postdoctoral fellow**

Project Investigator: **Dr. Jerome Canivet (IRCELYON)**

Research topic: Design, syntheses and applications of heterogeneous catalysts based on MOFs and POPs

2013-2019 **Indian Institute of Science Education and Research (IISER) Pune** **PhD (Chemistry)**

Thesis Supervisor: **Prof. Sujit K. Ghosh (IISER Pune)**

Thesis Title: "Design, Syntheses and Functional Studies of Porous Materials for Remediation of Environmental Pollutants".

2011-2013 **Indian Institute of Technology (IIT) Kharagpur** **Master of Science (MS)**

CGPA: 8.6 (Organic Chemistry)

2008-2011 **University of Calcutta (C.U.)** **Bachelor of Science (BS)**

Marks obtained: 70.4% (Chemistry)

Early Research Experience

1. Summer Internship at IACS Kolkata (May'12-Jun'12)

Under the supervision of Dr. Sudip Malik at Indian Association for the Cultivation of Science (IACS) on 2012.

2. MS Thesis Project at IIT Kharagpur (Jul'12-Apr'13)

Carried out one year project entitled, "A Vinyl Sulfone Based Regioselective Synthesis of 1,5-disubstituted 1,2,3-Triazoles and Study on Their Reaction Pathways" under the supervision of Prof. Tanmaya Pathak at IIT Kharagpur (2012-2013).

List of Publications

Total published articles: 37

Citations: 2166

h-index: 19

1. **Partha Samanta**, Albert Solé-Daura, Remy Rajapaksha, Florian M. Wisser, Frederic Meunier, Yves Schuurman, Capucine Sassoie, Caroline Mellot-Draznieks, and Jérôme Canivet*. Heterogenized Molecular Rhodium Phosphine Catalysts within Metal–Organic Frameworks for Alkene Hydroformylation. *ACS Catal.* **2023**, *13*, (DOI: 10.1021/acscatal.3c00398).
2. **Partha Samanta**, Priyanshu Chandra, Subhajit Dutta, Aamod V. Desai and Sujit K. Ghosh*. Chemically Stable Ionic Viologen–Organic Network: An Efficient Scavenger of Toxic Oxo-anions from Water. *Chem. Sci.*, **2018**, *9*, 7874-7881.
3. **Partha Samanta**,[†] Aamod V. Desai,[†] Bihag Anothumakkool, Mandar M. Shirolkar, Avishek Karmakar, Sreekumar Kurungot and Sujit K. Ghosh*. Enhanced Proton Conduction by Post-Synthetic Covalent Modification in a Porous Covalent Framework. *J. Mater. Chem. A*, **2017**, *5*, 13659-13664.
4. Aamod V. Desai,[†] **Partha Samanta**,[†] Biplab Manna and Sujit K. Ghosh*. Aqueous phase nitric oxide detection by an amine-decorated metal–organic framework. *Chem. Commun.* **2015**, *51*, 6111-6114.
5. **Partha Samanta**, Aamod V. Desai, Shivani Sharma, Priyanshu Chandra and Sujit K. Ghosh*. Selective Recognition of Hg(II) ion in Water by a Functionalized Metal–Organic Framework (MOF) Based Chemodosimeter. *Inorg. Chem.* **2018**, *57*, 2360-2364.
6. **Partha Samanta**, Priyanshu Chandra, Aamod V. Desai and Sujit K. Ghosh*. Chemically Stable Microporous Hyper-cross-linked Polymer (HCP): An Efficient Selective Cationic Dye Scavenger from Aqueous Medium. *Mater. Chem. Front.* **2017**, *1*, 1384 - 1388.
7. **Partha Samanta**, Subhajit Dutta and Sujit K. Ghosh*. Metal-organic Frameworks (MOFs) for Detection and Desensitization of Environmentally Hazardous Nitro-explosives and Related High Energy Materials (HEMs). *Elsevier*, Book chapter, **2018**, Edited by: Dr. Sujit K. Ghosh, Book Title: *Metal-Organic Frameworks (MOFs) for Environmental Applications*.
8. **Partha Samanta**, Priyanshu Chandra and Sujit K. Ghosh*. Hydroxy-functionalized hyper-cross-linked ultra-microporous organic polymers for selective CO₂ capture at room temperature. *Beilstein J. Org. Chem.* **2016**, *12*, 1981-1986.
9. **Partha Samanta**[†], Aamod V. Desai[†], Sumanta Let and Sujit K. Ghosh*. Advanced Porous Materials for Sensing and Sequestration of Organic Pollutants. *ACS Sustainable Chem. Eng.* **2019**, *7*, 7456-7478.

10. **Partha Samanta**[†], Sumanta Let[†], Writakshi Mandal, Subhajit Dutta and Sujit K. Ghosh*. Metal-organic Frameworks (MOFs) Based Luminescent Sensory Probes for the Recognition of Cationic Water Pollutants. *Inorg. Chem. Front.* **2020**, *7*, 1801-1821.
11. Avishek Karmakar,[†] **Partha Samanta**[†] and Sujit K. Ghosh. Fluorescent “Turn-on” Sensing Based on Metal-organic Frameworks (MOFs). *Chem. Asian J.*, **2019**, *14*, 4506-4519.
12. **Partha Samanta**[†], Subhajit Dutta[†] and Sujit K. Ghosh*. Hydroxy Functionalized Porous Organic Material: A Cost Effective Scavenger of Iodine from Vapor and Water Medium. *ChemPlusChem*, **2022**, *87*, e202200212.

As co-author

13. Sumanta Let, Subhajit Dutta[†], **Partha Samanta**[†], Shivani Sharma and Sujit K. Ghosh*. Magnetic Nanoparticle-Embedded Ionic Microporous Polymer Composite as an Efficient Scavenger of Organic Micropollutants. *ACS Appl. Mater. Interfaces*, **2021**, *13*, 51474–51484.
14. Arunabha Sen[†], Subhajit Dutta[†], Gourab Dam, **Partha Samanta**, Sumanta Let, Shivani Sharma, Mandar Shirolkar and Sujit K. Ghosh*. Imidazolium Functionalized Chemically Robust Ionic Porous Organic Polymers (iPOPs) toward Toxic Oxo-pollutants Capture from Water. *Chem. Eur. J.*, **2021**, *27*, 13442–13449.
15. Debanjan Mahato, Sahel Fajal, **Partha Samanta**, Writakshi Mandal and Sujit K. Ghosh*. Selective and Sensitive Fluorescence Turn-on Detection of Cyanide Ions in Water by Post Metallization of a MOF. *ChemPlusChem*, **2021**, DOI: 10.1002/cplu.202100426.
16. Yorck Mohr, Marcelo Alves-Favaro, Rémy Rajapaksha, Gaëlle Hisler, Alisa Ranscht, **Partha Samanta**, Chantal Lorentz, Mathis Duguet, Caroline Mellot-Draznieks, Elsje Alessandra Quadrelli, Florian M. Wisser*, Jérôme Canivet*. Heterogenization of a Molecular Ni Catalyst within a Porous Macroligand for the Direct C–H Arylation of Heteroarenes. *ACS Catal.* **2021**, *11*, 3507–3515.
17. Subhajit Dutta, Sumanta Let, Mandar M Shirolkar, Aamod V. Desai, **Partha Samanta**, Sahel Fajal, Yogeshwar D. More and Sujit K. Ghosh*. A Luminescent Cationic MOF for Bimodal Recognition of Chromium and Arsenic based Oxo-anions in Water. *Dalton Trans.* **2021**, DOI: 10.1039/D1DT01097B.
18. Subhajit Dutta, **Partha Samanta**, Biplab Joarder, Sumanta Let, Debanjan Mahato, Ravichandar Babarao and Sujit K. Ghosh*. A Water Stable Cationic MOF with Hydrophobic Pore Surface as Efficient Scavenger of Oxo-anion Pollutants from Water. *ACS Appl. Mater. Interfaces* **2020**, *12*, 41810–41818.
19. Subhajit Dutta, Aamod V. Desai, **Partha Samanta** and Sujit K. Ghosh*. Syntheses and structural elucidation of neutral N-donor linker based bi-porous isostructural cationic metal-organic frameworks. *Inorg. Chimica Acta*, **2019**, *486*, 401-405.
20. Sahel Fajal, **Partha Samanta**, Subhajit Dutta and Sujit K. Ghosh*. Selective and sensitive recognition of Fe³⁺ ion by a Lewis basic functionalized chemically stable metal-organic framework (MOF). *Inorg. Chimica Acta*, **2019**, *502*, 119359.
21. Sumanta Let, **Partha Samanta**, Subhajit Dutta and Sujit K. Ghosh*. A Dye@MOF Composite as Luminescent Sensory Material for Selective and Sensitive Recognition of Fe(III) ions in Water. *Inorg. Chimica Acta*, **2019**, *500*, 119205.
22. Aamod V. Desai, Arkendu Roy, **Partha Samanta**, Biplab Manna and Sujit K. Ghosh*. Base Resistant Ionic Metal-Organic Framework as a Porous Ion-Exchange Sorbent. *iScience* **2018**, *3*, 21-30.

23. Soumya Mukherjee, Zhixin Zeng, Mandar M. Shirolkar, **Partha Samanta**, Abhijeet K. Chaudhari, Jin-Chong Tan and Sujit K. Ghosh*. Self-assembled, Fluorine-rich Porous Organic Polymers: A Class of Mechanically Stiff and Hydrophobic Materials.
Chem. Eur. J. **2018**, DOI: [10.1002/chem.201802200](https://doi.org/10.1002/chem.201802200).
24. Aamod V. Desai, Biplab Joarder, Arkendu Roy, **Partha Samanta**, Ravichandar Babarao and Sujit K. Ghosh*. Multifunctional Behavior of Sulfonate-Based Hydrolytically Stable Microporous Metal-Organic Frameworks.
ACS Appl. Mater. Interfaces, **2018**, DOI: [10.1021/acsami.8b14420](https://doi.org/10.1021/acsami.8b14420).
25. Arunabha Sen, **Partha Samanta** and Sujit K. Ghosh*. Advanced porous materials: A promising candidate for sequestration of industrial hazardous dye effluents.
Central West Publishing, Book chapter (Just accepted), **2018**, Edited by: Dr. Vikas Mittal, Book Title: *Porous Polymer Networks*.
26. Arunabha Sen, Aamod V. Desai, **Partha Samanta**, Subhajit Dutta, Sumanta Let and Sujit K. Ghosh*. Post-synthetically modified metal-organic framework as a scaffold for selective bisulphite recognition in water.
Polyhedron **2018**, (DOI: [10.1016/j.poly.2018.08.069](https://doi.org/10.1016/j.poly.2018.08.069)).
27. Avishek Karmakar, **Partha Samanta**, Aamod V. Desai and Sujit K. Ghosh*. Guest Responsive Metal-Organic Frameworks as Scaffolds for Separation and Sensing Applications.
Acc. of Chem. Res. **2017**, *50*, 2457-2469.
28. Avishek Karmakar, Biplab Joarder, Abhik Mallick, **Partha Samanta**, Aamod V. Desai, Sudipta Basu and Sujit K. Ghosh*. Aqueous Phase Sensing of Cyanide Ion Using a Hydrolytically Stable Metal-organic Framework.
Chem. Commun. **2017**, *53*, 1253-1256.
29. Avishek Karmakar, Rajith Illathvalappil, Bihag Anothumakkool, Arunabha Sen, **Partha Samanta**, Aamod V. Desai, Sreekumar Kurungot and Sujit K. Ghosh*. Hydrogen-Bonded Organic Frameworks: A New Class of Porous Crystalline Proton Conducting Materials.
Angew. Chem. Int. Ed. **2016**, *55*, 10667-10671.
30. Avishek Karmakar, Amrit Kumar, Abhijeet K. Chaudhari, **Partha Samanta**, Aamod V. Desai, Rajamani Krishna and Sujit K. Ghosh*. Bimodal functionality in a porous covalent triazine framework by rational integration of electron rich and deficient pore surface.
Chem. Eur. J. **2016**, *22*, 4931-493.
31. Avishek Karmakar, Naveen Kumar, **Partha Samanta**, Aamod V. Desai and Sujit K. Ghosh*. A Post-synthetically Modified MOF for Selective and Sensitive Aqueous Phase Detection of Highly Toxic Cyanide ion.
Chem. Eur. J. **2016**, *22*, 864-868.
32. Biplab Manna, Bihag Anothumakkool, Aamod V. Desai, **Partha Samanta**, Sreekumar Kurungot, and Sujit K. Ghosh*. Coherent Fusion of Water Array and Protonated Amine in a Metal-Sulphate Based Coordination Polymer for Proton Conduction.
Inorg. Chem., **2015**, *54*, 5366-5371.
33. Sanjog S. Nagarkar, Aamod V. Desai, **Partha Samanta** and Sujit K. Ghosh*. Aqueous phase selective detection of 2,4,6-trinitrophenol using a fluorescent metal-organic framework with a pendant recognition site.
Dalton Trans., **2015**, *44*, 15175-15180.
34. Biplab Joarder, Aamod V. Desai, **Partha Samanta**, Soumya Mukherjee and Sujit K. Ghosh*. Selective and Sensitive Aqueous-Phase Detection of 2,4,6-Trinitrophenol (TNP) by an Amine-Functionalized Metal-Organic Framework.
Chem. Eur. J., **2015**, *21*, 965-969.
35. Chanchal Chakraborty, Manas Kumar Bera, **Partha Samanta** and Sudip Malik*. Selective Detection of Cyanide by a Polyfluorene-based Organoboron Fluorescent Chemodosimeter.
New J. Chem., **2013**, *37*, 3222-3228.

36. Writakshi Mandal, Sahel Fajal, **Partha Samanta**, Subhajit Dutta, Mandar M. Shirolkar, Yogeshwar D. More and Sujit K. Ghosh*. Selective and Sensitive Recognition of Specific Types of Toxic Organic Pollutants with a Chemically Stable Highly Luminescent Porous Organic Polymer (POP).
ACS Appl. Polym. Mater., **2022**, *4*, 8633–8644.
37. Sumanta Let, Gourab K. Dam, **Partha Samanta**, Sahel Fajal, Subhajit Dutta and Sujit K. Ghosh*. Palladium anchored N-Heterocyclic Carbene in a Porous Organic Polymer (POP): A Heterogeneous Composite Catalyst for Eco-Friendly C-C Coupling.
J. Org. Chem., **2022**, *87*, 16655–16664.

(† indicates equal contribution)

Technical Skills

Characterization Technique Used: Gas chromatography (GC) • Single crystal diffraction data analysis (Bruker Apex II Duo and Bruker D8 Venture Duo) • Powder X-ray analysis (Bruker Nonius Smart Apex II) • SEM analysis • TEM analysis • BEL-MAX/BEL-Aqua (Bel Japan) for adsorption studies, BET analysis, Pore size analysis • XPS • UV-Visible spectrometers • Fluorescence (Photoluminescence) spectrometers • ¹H and ¹³C NMR on 400 and 500 MHz instruments • FT-IR spectrometer • Thermogravimetric analysis (TGA).

Synthetic Techniques: Crystallization techniques • Synthesis of MOFs, porous polymers (POPs) etc. • heterogeneous and homogeneous catalysis • synthesis of compounds related to Organic, Inorganic and Material chemistry • Protective atmosphere syntheses (Schlenk lines, Glove box).

Softwares: MS office • Adobe • Corel draw • ChemDraw • Spreadsheet analysis • Origin • Mercury • Discovery Studio • Apex-2 and Apex-3 • WingX • Shelx.

Languages known: English (Fluent) • Hindi (Fluent) • Bengali (Fluent)

Academic Awards & Honors

- Awarded prestigious INSPIRE fellowship by Department of Science and Technology (DST), Government of India (Batch 2008).
- Qualified all India CSIR-UGC NET examination to obtain research fellowship for doctoral studies (Rank-75 in 2012 and Rank-66 in 2013).

Teaching Experience

Inorganic Chemistry - 1 semester

Transition Metal Chemistry - 2 semesters