

Dr. Sagar Ganguli

Postdoctoral (Carl Tryggers) Fellow

Dept. of Chemistry- Ångström Laboratory, Uppsala University, Sweden

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Summary of Expertise:

- Adept in performing different **electrochemical measurements** and subsequent data analysis.
- Experienced in **plasmon assisted electrocatalysis** and **single-entity electrochemistry**.
- Synthesis of functional inorganic materials (**oxides, hydroxides, sulfides, fluorides, metallic nanoparticles, etc.**) through variety of synthesis methods (**solvothermal, thermal decomposition, chemical bath deposition, annealing, electrodeposition, microwave, etc.**).
- Measurement of **absorption and emission** spectra of materials under ambient as well as controlled conditions and subsequent data analysis.
- Analysis of **PXRD (Rietveld Refinement), FT-IR, XPS, BET, ICP-MS, SEM and TEM** data.
- Proficient with softwares such as **MS Word, MS PowerPoint, OriginLab, Image J, CASA XPS, X'Pert Highscore Plus**, etc.
- Experienced in **3D printing**
- Strong interpersonal skills. **Trained three PhD and two MS** students during doctoral studies.

Professional Experience

- **Postdoctoral Researcher at Uppsala University** (Sep 2020- Ongoing)
 - Mechanistic investigation of plasmon assisted electrocatalysis.
 - Single entity electrochemistry
- **Research Associate at IISER Kolkata** (Jan 2020- Jun 2020)
 - Synthesis of transition-based materials as **electrocatalysts** for water splitting and hydrazine oxidation.
 - **Training Junior PhD students** of the lab for smooth transition of responsibilities.
- **Doctoral Student at IISER Kolkata** (Aug 2014- Dec 2019)
 - Synthesis of nickel and cobalt based materials as **electrocatalysts** for water splitting.
 - Understanding factors that control the electrocatalytic activity of materials.
 - **Setting up the electrochemical division** in the lab from scratch.
 - Development of UV-vis-NIR active **photocatalysts**.
 - Synthesis of **lanthanide doped luminescent nanocrystals**.
 - Investigating the energy transfer processes between lanthanide ions doped in inorganic hosts.
- **Summer Internship at “State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Jilin University (Zhuhai Campus), P. R. China”** (Jun 2013- Jul 2013)
 - Development of porous aromatic framework.

Research Interests:

Electrochemical systems, Electrocatalyst synthesis, Electrocatalytic oxidation/reduction of organic molecules, Bioelectrocatalysis, Water Splitting, Batteries and Supercapacitors, Development of Photocatalysts, Design of Functional Materials with Tunable Properties, Lanthanide doped Upconverting Nanoparticles.

Publications (according to date of acceptance):

(Citations: 171; *h*-index: 7; *i10* index: 5) [Source: <https://scholar.google.co.in/citations?user=cgOSzp0AAAAJ&hl=en>]

1. Design Principle of Monoclinic NiCo₂Se₄ and Co₃Se₄ Nanoparticles with Opposing Intrinsic and Geometric Electrocatalytic Activity toward the OER. **Sagar Ganguli***, Sourav Ghosh, Gouri Tudu, Heramba V. S. R. M. Koppiseti, Venkataramanan Mahalingam*, *Inorg. Chem.*, 2021, 60, 9542-9551, DOI: 10.1021/acs.inorgchem.1c00649
2. Influence of Vanadate Structure on Electrochemical Surface Reconstruction and OER Performance of CoV₂O₆ and Co₃V₂O₈. Ayan Mondal, **Sagar Ganguli**, Harish Reddy Inta, Venkataramanan Mahalingam*, *ACS Appl. Energy Mater.*, 2021, 4, 5381-5387, DOI: 10.1021/acsaelm.1c00701
3. Nickel–cobalt oxalate as an efficient non-precious electrocatalyst for an improved alkaline oxygen evolution reaction. Sourav Ghosh, Rajkumar Jana, **Sagar Ganguli**, Harish Reddy Inta, Gouri Tudu, Heramba VSRM Koppiseti, Ayan Datta, Venkataramanan Mahalingam*, *Nanoscale Adv.*, 2021, 3, 3770-3779, DOI: 10.1039/D1NA00034A (Selected for *Popular Advances* Collection)
4. Ethylene glycol-mediated one-pot synthesis of Fe incorporated α -Ni(OH)₂ nanosheets with enhanced intrinsic electrocatalytic activity and long-term stability for alkaline water oxidation. Gouri Tudu, Sourav Ghosh‡, **Sagar Ganguli‡**, Heramba V. S. R. M. Koppiseti, Harish Reddy Inta, Venkataramanan Mahalingam*, *Dalton Trans.*, 2021, 50, 7305-7313, DOI: 10.1039/D1DT00226K (‡ Equal contribution)
5. Rejuvenating the geometric electrocatalytic OER performance of crystalline Co₃O₄ by microstructure engineering with sulphate. Heramba V. S. R. M. Koppiseti, **Sagar Ganguli**, Sourav Ghosh, Venkataramanan Mahalingam*, *Chem. Asian J.*, 2021, 16(8), 988-998. DOI: 10.1002/asia.202100175
6. Engineering of oxygen vacancy as defect sites in silicates for removal of diverse organic pollutants and enhanced aromatic alcohol oxidation. Debashrita Sarkar, Khushboo S. Paliwal, **Sagar Ganguli**, Athma E. Praveen, Dipannita Saha, Venkataramanan Mahalingam*, *J. Environ. Chem. Eng.*, 2021, 9(2), 105134, DOI: 10.1016/j.jece.2021.105134
7. Electrochemical reconstruction of Zn_{0.3}Co_{2.7}(PO₄)₂·4H₂O for enhanced water oxidation performance. Rahul Kumar, Harish Reddy Inta, Heramba V. S. R. M. Koppiseti, **Sagar Ganguli**, Sourav Ghosh, Venkataramanan Mahalingam*, *ACS Appl. Energy Mater.*, 2020, 3(12), 12088-12098, DOI: 10.1021/acsaelm.0c02200
8. Inception of Co₃O₄ as Microstructural Support to Promote Alkaline Oxygen Evolution Reaction for Co_{0.85}Se/Co₉Se₈ Network. Sourav Ghosh, Gouri Tudu, Ayan Mondal, **Sagar Ganguli**, Harish Reddy Inta, Venkataramanan Mahalingam*, *Inorg. Chem.*, 2020, 59, 17326-17339, DOI: 10.1021/acs.inorgchem.0c02618
9. Phosphorescent Trinuclear Pt–Ir–Pt Complexes: Insights into the Photophysical and Electrochemical Properties and Interaction with Guanine Nucleobase. Bishnu Das, Sakira Tabbasum Borah, **Sagar Ganguli**, Parna Gupta*, *Chem. Eur. J.*, 2020, 26(65), 994-1000, DOI: 10.1002/chem.202002941
10. MoO₂ as a propitious “pore-forming additive” for boosting the water oxidation activity of cobalt oxalate microrods. Sourav Ghosh, Harish Reddy Inta, **Sagar Ganguli**, Gouri Tudu, Heramba V. S. R. M. Koppiseti, Venkataramanan Mahalingam*, *J. Phys. Chem. C*, 2020, 124(37), 20010-20020, DOI: 10.1021/acs.jpcc.0c05787
11. Defect induced “super mop” like behaviour of Eu³⁺-doped hierarchical Bi₂SiO₅ nanoparticles for improved catalytic and adsorptive behavior. Debashrita Sarkar, **Sagar Ganguli**, Athma E. Praveen, Venkataramanan Mahalingam*, *Mater. Adv.*, 2020, 1(6), 2019-2032, DOI: 10.1039/D0MA00363H

12. Prudent electrochemical pretreatment to promote OER by catalytically inert “Iron incorporated metallic Ni nanowires” synthesized via “non–classical” growth mechanism. Athma E. Praveen, **Sagar Ganguli**, Venkataramanan Mahalingam*, *Nanoscale Adv.*, 2020, 2(5), 1927-1938, DOI: 10.1039/D0NA00073F (Selected in Nanoscale Advances *HOT Article* Collection)
13. Paradoxical observance of “intrinsic” and “geometric” oxygen evolution electrocatalysis in phase tuned cobalt oxide/hydroxide nanoparticles. **Sagar Ganguli**, H.V.S.R.M. Koppiseti, Sourav Ghosh, Tanmoy Biswas, Venkataramanan Mahalingam* *ACS Appl. Nano Mater.*, 2019, 2(12), 7957-7968, DOI: 10.1021/acsanm.9b01990
14. Inception of molybdate as a “pore forming additive” to enhance the bi-functional electrocatalytic activity of nickel and cobalt based mixed hydroxides for overall water splitting. **Sagar Ganguli**, Sourav Ghosh, Soumik Das, Venkataramanan Mahalingam* *Nanoscale*, 2019, 11(36), 16896-16906, DOI: 10.1039/c9nr05142b
15. Efficient Photodegradation of Organic Pollutants By Using a Bi₂CuO₄/BiPO₄ Heterojunction Photocatalyst. Athma E Praveen, Tuhin Samanta, **Sagar Ganguli**, Venkataramanan Mahalingam*, *ChemPhotoChem*, 2019, 3(4), 204-210, DOI: 10.1002/cptc.201800226
16. Design of lanthanide-doped colloidal nanocrystals: applications as phosphors, sensors and photocatalysts. Debasrita Sarkar, **Sagar Ganguli**, Tuhin Samanta, Venkataramanan Mahalingam*, *Langmuir*, 2019, 35(19), 6211-6230, DOI: 10.1021/acs.langmuir.8b01593
17. Effect of intrinsic property of anions on the electrocatalytic activity of NiCo₂O₄ and NiCo₂O_xS_{4-x} grown by chemical bath deposition. **Sagar Ganguli**, Soumik Das, Simran Kumari, Harish Reddy Inta, Ashwani Kumar Tiwari, Venkataramanan Mahalingam*, *ACS Omega*, 2018, 3(8), 9066-9074, DOI: 10.1021/acsomega.8b00952 [*This work later got selected for “best poster presentation” award at both national and international conferences organized by other institutes (vide infra)*]
18. Strong UV emission from Eu²⁺-doped BaSO₄ nanoparticles: A material for enhancing the photocatalytic activity of carbon dots. Chanchal Hazra, Tuhin Samanta, **Sagar Ganguli**, Venkataramanan Mahalingam*, *Chemistry Select*, 2017, 2(21), 5970-5977, DOI: 10.1002/slct.201700647
19. Tuning the energy transfer efficiency between Ce³⁺ to Ln³⁺ (Ln= Tb, Sm, Tm, Dy) by controlling the crystal phase of NaYF₄ nanocrystals. Venkata N.K.B. Adusumalli, Heramba, V.S.R.M. Koppiseti, **Sagar Ganguli**, Venkataramanan Mahalingam*, *Chem. Eur. J.*, 2017, 23(5), 994-1000, DOI: 10.1002/chem.201604316
20. Near-infrared light triggered superior photocatalytic activity from MoS₂-NaYF₄:Yb³⁺/Er³⁺ nanocomposites. Manjunath Chatti, Venkata N. K. B. Adusumalli, **Sagar Ganguli**, Venkataramanan Mahalingam*, *Dalton Trans.*, 2016, 45, 12384-12392, DOI: 10.1039/C6DT02548J
21. Synthesis of Hexagonal-Phase Eu³⁺-Doped GdF₃ Nanocrystals above Room Temperature by Controlling the Viscosity of the Solvents. Tuhin Samanta, Chanchal Hazra, Athma E Praveen, **Sagar Ganguli**, Venkataramanan Mahalingam*, *Eur. J. Inorg. Chem.*, 2016, 6, 802-807, DOI: 10.1002/ejic.201501146
22. A highly efficient UV-vis-NIR active Ln³⁺-doped BiPO₄/BiVO₄ nanocomposite for photocatalysis application. **Sagar Ganguli**, Chanchal Hazra, Manjunath Chatti, Tuhin Samanta, Venkataramanan Mahalingam*, *Langmuir*, 2016, 32 (1), 247–253, DOI: 10.1021/acs.langmuir.5b03289 [*This work was later selected for “best poster presentation” award at in-house DCS day conference (vide infra)*]
23. Photoluminescence and photocatalytic activity of monodispersed colloidal “ligand free Ln³⁺-doped PbMoO₄ nanocrystals”. **Sagar Ganguli**, Chanchal Hazra, Tuhin Samanta, Venkataramanan Mahalingam*, *RSC Adv.*, 2015, 5, 45611-45617, DOI: 10.1039/C5RA05242D

• Conferences:

- **ICCFM 2018, S. N. Bose National Centre for Basic Sciences:** Presented poster titled “Edge of sulfides over pure oxides as water oxidation electrocatalysts: A study through electrochemistry, microscopy and nanoindentation on mesoporous NiCo_2O_4 and $\text{NiCo}_2\text{O}_x\text{S}_{4-x}$.” (*Awarded best poster*)
- **Chemistry: Today or Tomorrow (DST-PURSE) 2018, University of Kalyani:** Presented poster titled “Understanding the edge of sulfide incorporated electrocatalysts over pure oxides for water oxidation: A tale of NiCo_2O_4 and $\text{NiCo}_2\text{O}_x\text{S}_{4-x}$.” (*Awarded best poster*)
- **Journal of Physical Chemistry workshop 2018, IISER Kolkata:** Presented poster titled “Understanding the edge of sulfide incorporated electrocatalysts over pure oxides for water oxidation: A tale of NiCo_2O_4 and $\text{NiCo}_2\text{O}_x\text{S}_{4-x}$.”
- **ICONSAT 2016, IISER Pune:** Presented poster titled “Highly efficient UV-Vis-NIR active Ln^{3+} -doped $\text{BiPO}_4/\text{BiVO}_4$ nanocomposite photocatalyst.”
- **DCS Day 2016, IISER Kolkata:** Presented poster titled “UV-vis-NIR” active Ln^{3+} -doped $\text{BiPO}_4/\text{BiVO}_4$ nanocomposite for photocatalysis application.” (*Awarded best poster*)

Additional Experiences:

- (i) Participated in setting up the entire wet lab as well as instrumental lab in the permanent campus of the institute, which was earlier operating from a transit campus.
- (ii) One of the members to start electrochemistry division during doctoral career in the laboratory from scratch.
- (iii) Trained three PhD and two MS students in the field of electrochemistry.
- (iv) **Assigned “Reviewer” for articles in JMC A.**

Education:

- **Master of Sciences (MS)** (Aug 2012- Jul 2014)
 - **Indian Institute of Science Education and Research (IISER) Kolkata**
 - One-year project on the development of photocatalysts and colloidal lanthanide doped luminescent nanomaterials.
 - Two years of coursework with chemistry as major subject.
 - **CGPA 8.48**
- **Bachelor of Sciences (BSc)** (Aug 2009- Jun 2012)
 - **University of Burdwan**
 - Three years of theoretical and laboratory coursework.
 - **1st class (69.88%)**

Academic Honours and Awards:

- (i) **Carl Tryggers Postdoctoral Fellowship** (*Utilized for postdoctoral stint at Uppsala University, Sweden*)
- (ii) **Government of Ireland Postdoctoral Fellowship (GOIPD) 2020:** (*Declined the offer*)
- (iii) **IISER- K fellowship:** Grant for both MS and PhD. (*Utilized for pursuing MS*)
- (iv) **CSIR-UGC National Eligibility Test (CSIR-70) in Chemical Sciences:** Grant for PhD as well as qualification for lectureship position at colleges and universities. (*Utilized for pursuing PhD*)

Teaching Experience:

Teaching assistant in “Chemistry Lab-I” course during Autumn semester, 2017 at IISER Kolkata.

Instrument Handling:

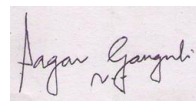
Adept in operating (i) Electrochemical Workstation, (ii) Spectrofluorometer, (iii) UV-vis-NIR spectrometer, (iv) FT-IR spectrometer, (v) Cryostat, (vi) Glovebox, (vii) P-XRD.

List of References:

Dr. Venkataramanan Mahalingam Professor Department of Chemical Sciences IISER Kolkata Mohanpur, Nadia, West Bengal, India Email: mvenkataramanan@yahoo.com Context: PhD supervisor	Dr. Alina Sekretareva Researcher Department of Chemistry – Ångström Laboratory, Uppsala University Email: alina.sekretareva@kemi.uu.se Context: Postdoctoral supervisor	Dr. Sayam Sengupta Associate Professor Department of Chemical Sciences IISER Kolkata Mohanpur, Nadia, West Bengal, India Email: sayam.sengupta@iiserkol.ac.in Context: Member of “Research Progress Committee”
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I hereby declare that above furnished information is true and complete to the best of my knowledge and I bear full responsibilities for the correctness of the mentioned particulars.

Place: Uppsala, Sweden
Date: 06.09.2021



(Sagar Ganguli)