Dr. SHAMEEL THURAKKAL

Assistant Professor, Department of Nanoscience and Technology
University of Calicut, Malappuram-673635, Kerala, India
shameelt88@gmail.com; +919747604949
https://scholar.google.co.in/citations?user=aO4MRucAAAAJ&hl=en

ACADEMIC CREDENTIALS

PhD Chemistry **2018**
CSIR-NIIST, India
Thesis title - Organic Donor – Acceptor Systems for Metal Ion Recognition and OLED Applications (*https://drive.google.com/file/d/1wMNqou8L8HuDQrdjRNusVQkhvQ4ukF2y/view*)
Supervisor - Prof. Danaboyina Ramaiah

MSc Chemistry **2010**
Bharathidasan University, India

BSc Chemistry **2008**
University of Calicut, India

RESEARCH EXPERIENCE

(*2019-2022*) Postdoctoral Fellow, Chalmers University of Technology, Sweden

Supervisor - Prof. Xiaoyan Zhang
Project title - "Chemical functionalization of 2D materials for ad hoc applications"

- **Design and synthesis of chemically modified 2D materials with enhanced ambient stability and improved physicochemical properties** – Synthesis of organic functional dye molecules (porphyrins). Liquid phase exfoliation of graphene, MXenes and black phosphorus nanosheets. Covalent/noncovalent functionalization of 2D materials. Characterization of 2D materials using IR (ATR), Raman, XPS, TGA, TEM and SEM analyses. Investigation of the effect of functionalization on the ambient stability of 2D materials by analysing degree of oxidation using UV vis absorption and XPS techniques.
- **Graphene - polyquinoxalines composites for electrode materials in supercapacitor devices** – Synthesis of redox active organic small molecules (Anthracene and Pyrene tetraones) and aza-fused aromatic conjugated polymers. Preparation and characterization of rGO and graphene-polymer nanocomposites. Fabrication and characterization of supercapacitor devices.

(*2018-2019*) Project Assistant III, CSIR - NIIST, India

Supervisor – Dr. Joshy Joseph
Project title - Nano-biosensors and microfluidics for health care

- Covalent functionalization of carbon nanotubes with antibodies for biosensor applications
- Synthesis and characterization of organic functional molecules

(*2012-2018*) PhD student, CSIR – NIIST, India

Supervisor – Prof. Danaboyina Ramaiah

Project title - Synthesis of organic donor – acceptor systems for lighting and sensing applications

- Synthesis of blue (carbazole-oxadiazole) and green (phenoxazine-oxadiazole) light emitting materials
- Synthesis of quinoline – carbaldehyde systems for sensing applications
- Purification (TLC, column chromatography, distillation and recrystallization methods) and characterization (NMR, ESI-MS, HRMS, IR and CV) of organic molecules
- Photophysical characterization of organic molecules using UV-Vis spectrophotometer, Spectrofluorimeter, Time Correlated Single Photon Counting spectrometer system and nanosecond laser flash photolysis system

TEACHING EXPERIENCE

(*10/2023- present*)- Assistant Professor, Department of Nanoscience and Technology, University of Calicut, Kerala, India

Subject area: Organic chemistry, Organometallic compounds, Nanomaterials for supercapacitor applications

(*08/2023- 09/2023*) Lecturer, Department of Chemistry, PTM Government College (affiliated to University of Calicut), Perinthalmanna, India

Subject area: Organic chemistry

(*09/2022- 08/2023*) Lecturer, PG & Research Department of Chemistry, MES KeVeeYam College (affiliated to University of Calicut), Valanchery, India

Subject area: Organic chemistry, Coordination chemistry

(*07/2010- 03/2011*) Lecturer, Seethi Sahib Memorial Polytechnic College, Tirur, India

PUBLICATIONS

1. Noncovalent functionalization of $Ti_3C_2T_X$ using cationic porphyrins with enhanced stability against oxidation, **S. Thurakkal** and X. Zhang, *Mat. Chem. Front.*, **2022**, *6*, 561.

2. Spin-Coated Heterogenous Stacked Electrodes for Performance Enhancement in CMOS-Compatible On-Chip Microsupercapacitors, A. Vyas, S. Z. Hajibagher, U. Méndez-Romero, **S. Thurakkal**, Q. Li, M. Haque, R. K. Azega, E. Wang, X. Zhang, P. Lundgren, P. Enoksson and A. Smith, *ACS Appl. Energy Mater.*, **2022**, *4*, 4221.

3. Covalent Functionalization of Two-Dimensional Black Phosphorus Nanosheets with Porphyrins and Its Photophysical Characterizations, **S. Thurakkal** and X. Zhang, *Mat. Chem. Front.*, **2021**, *5*, 2824.

4. Efficient Visible-to-UV Photon Up Conversion Systems Based on CdS Nanocrystals Modified with Triplet Energy Mediators, L. Hou, A. Olesund, **S. Thurakkal**, X. Zhang and B. Albinsson, *Adv. Funct. Mater.*, **2021**, 2106198.

5. The Art of Constructing Black Phosphorus Nanosheet Based Heterostructures: From 2D to 3D, **S. Thurakkal**, D. Feldstein, R. Perea-Causín, E. Malic and X. Zhang, *Adv. Mater.*, **2021**, *33*, 2005254.

6. Recent advances in chemical functionalization of two-dimensional black phosphorous nanosheets, **S. Thurakkal** and X. Zhang, *Adv. Sci.*, **2020**, *7*, 1902359.

7. Carbon-based electrode materials for microsupercapacitors in self-powering sensor networks: present and future development, A. D. Smith, Q. Li, A. Vyas, M. M. Haque, K. Wang, A. Velasco, X. Zhang, **S. Thurakkal**, A. Quellmalz, F. Niklaus, K. Gylfason, P. Lundgren and P. Enoksson, *Sensors*, **2019**, *19*, 4231.

8. A three-component supramolecular nanocomposite as a heavy atom free photosensitizer, P. P. P. Kumar, P. Yadav, A. Shanavas, **S. Thurakkal**, J. Joseph and P. P. Neelakandan, *Chem. Commun.*, **2019**, *55*, 5623–5626.

9. Synthesis and *in vitro* photobiological studies of porphyrin capped gold nanoparticles, A. K. Paul, D. T. Jayaram, P. S. Saneesh Babu, N. Adarsh, **S. Thurakkal**, A. S. Nair and D. Ramaiah, *J. Chem. Sci.*, **2018**, *130*, 133.

10. Design and synthesis of solution processable green fluorescent D-π-A dyads for OLED applications, **S. Thurakkal,** K. S. Sanju, A. Soman, K. N. N. Unni, J. Joseph, and D. Ramaiah, *New J. Chem.*, **2018**, *42*, 5456–5464.

11. Simple solution processable carbazole-oxadiazole hybrids for un-doped deep-blue OLEDs, **S. Thurakkal**, A. Soman, K. N. N. Unni, J. Joseph, and D. Ramaiah, *J. Photochem. Photobiol. A Chem.*, **2018**, *358*, 192–200.

12. Simultaneous binding of a cyclophane and classical intercalators to DNA: observation of FRET-mediated white light emission, K. S. Sanju, **S. Thurakkal**, P. P. Neelakandan, J. Joseph and D. Ramaiah, *Phys. Chem. Chem. Phys.*, **2015**, *17*, 13495–13500.

13. Selective and dual naked eye detection of Cu^{2+} and Hg^{2+} ions using a simple quinoline-carbaldehyde chemosensor, C. L. Devi, **S. Thurakkal**, B. H. Shankar and D. Ramaiah, *Sensors and Actuators B*, **2014,** *204*, 480–488.

AWARDS/GRANTS

2012 **CSIR–UGC Junior Research Fellowship in Chemical Sciences**
Council of Scientific & Industrial Research, **Govt. of India**

2012 **Graduate Aptitude Test in Engineering (GATE) in Chemistry**
The Department of Higher Education, **Govt. of India**

2014 **CSIR–UGC Senior Research Fellowship in Chemical Sciences**
Council of Scientific & Industrial Research, **Govt. of India**

CONFERENCES/PRESENTATIONS

- Invited talk on "Chemistry of 2D Materials Beyond Graphene" by **S. Thurakkal** during

scholars talk series organized by Farook College, University of Calicut, India, **November 2022**

- Oral presentation titled “solution processable carbazole-oxadiazole luminescent systems for non-doped deep-blue OLEDs” by **S. Thurakkal**, A. Soman, K.N.N. Unni, J. Joseph and D. Ramaiah during National Conference on Luminescence and its Applications (NCLA-2018) organized by CSIR-NIIST, India, **February 2018**

- Poster presentation titled “solution processable green fluorescent emitters with low singlet-triplet energy gap for OLED applications” by **S. Thurakkal**, K. S. Sanju, A. Soman, K. N. N. Unni, J. Joseph and D. Ramaiah during 8th East Asia Symposium (EAS8) 'Functional Dyes and Advanced Materials’ organized by CSIR-NIIST, India, **September 2017**

- Poster presentation titled “selective and dual naked eye detection of Cu^{2+} and Hg^{2+} ions using a simple Quinoline – Carbaldehyde system” by **S. Thurakkal**, C. Lavanya, B. H. Shankar and D. Ramaiah during Materials Research Society of India (MRSI) Symposium ‘Advanced Materials for Sustainable Applications’, CSIR – NEIST, Jorhat, India, **February 2016**

WORKSHOPS/CERTIFICATES

Credential name: 3D Illustration for Science Communication using Blender
Issued by: Scidart Academy (2023)