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Notice for the PhD Viva Voce Examination

Ms Samika Sanjay Anand, Registration Number: 2270128, PhD Scholar at the Department of Chemistry, School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Thursday, 25 September 2025 at 9.00 am in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru – 560029, Karnataka, India.

Title of the Thesis	:	**Multifunctional Coordination Polymers for Energy and Sensing Applications**
Discipline	:	**Chemistry**
External Examiner - I	:	**Dr Santanu Kumar Pal** Professor Indian Institute of Science Education and Research Mohali, Knowledge City, Sector 81, SAS Nagar Manauli Post Punjab - 140306
External Examiner - II	:	**Dr Sebastian C Peter** Professor School of Advanced Material (SAMat) Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bengaluru - 560064 Karnataka
Supervisor	:	**Dr Sunaja Devi K R** Professor Department of Chemistry School of Sciences CHRIST (Deemed to be University) Bengaluru-560029 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar (Academics)

Place: Bengaluru
Date: 18 September 2025

ABSTRACT

Coordination polymers (COPs) have emerged as versatile materials with tunable properties, making them promising candidates for energy storage, electrocatalysis, sensing, and environmental remediation. This thesis presents the design, synthesis, and application of novel COPs derived from d^{10} metals (Zn^{2+}, Cd^{2+}), lanthanides (Ho^{3+}, Tb^{3+}), and transition metals (Cu^{2+}, Co^{2+}, Ni^{2+}), utilizing strategically selected organic ligands, specifically 3,3'-diaminobenzidine (DAB) and perylene-3,4,9,10-tetracarboxylic acid (PTC) to tailor their structural and functional properties. A scalable, high-yield synthetic approach was employed to obtain well-defined crystalline COPs, which were comprehensively characterized using spectroscopic and microscopic techniques. Based on the properties of the synthesized COPs, their electrochemical behavior, including energy storage performance and electrocatalytic activity, as well as their fluorometric and colorimetric sensing abilities, have been systematically evaluated. This study advances research in COPs by tackling major challenges in scalability, stability, and multifunctional performance.

Keywords: *Coordination polymers; energy storage; supercapacitors; electrocatalytic water splitting; hydrogen evolution; fluorometric sensing.*

Publications:

1. **Samika Anand** and Kalathiparambil Rajendra Pai Sunajadevi, CuNi–PTC metal–organic framework: unveiling pseudocapacitive energy storage and water splitting capabilities, Nanoscale Advances; 2025. https://doi.org/10.1039/D5NA00300H.
2. **Samika Anand**, Sunaja Devi K. R.; Optimizing malachite green adsorption with Co-PTC metal organic framework: Insights into mechanisms and performance, Journal of Molecular Structure; 2024; 1318: 139256. https://doi.org/10.1016/j.molstruc.2024.139256.
3. **Samika Anand**, Abhishek Kumar, Kalathiparambil Rajendra Pai Sunajadevi, Channabasaveshwar V Yelamaggad, and Kaustava Bhattacharyya; High-performance Zn(II)-based coordination polymer as an electrode material for pseudocapacitive energy storage and hydrogen evolution; 2025. https://doi.org/10.1039/D5CY00282F
4. **Samika Anand**, Sunaja Devi K. R., Abhishek Kumar, Channabasaveshwar V Yelamaggad; Affordable Two-Dimensional Layered Cd(II) Coordination Polymer: High-Performance Pseudocapacitor Electrode Behavior, ACS Omega; 2024; 9 (40): 41807–41818. https://doi.org/10.1021/acsomega.4c06108.
5. **Samika Anand**, Abhishek Kumar, Kalathiparambil Rajendra Pai Sunajadevi, Channabasaveshwar V Yelamaggad; Green Approach for the Large-Scale Synthesis of a Metal–Organic Framework Derived From Perylene and Copper: A Fluorometric Sensor for Sm (III), Applied Organometallic Chemistry; 2025; 39 (3): e70084. http://dx.doi.org/10.1002/aoc.70084.
6. **Samika Anand**, Kalathiparambil Rajendra Pai Sunajadevi, Channabasaveshwar V. Yelamaggad; Advanced functional materials as high-performance fluorometric sensors for explosives detection, Materials Today Chemistry; 2025; 46: 102733. https://doi.org/10.1016/j.mtchem.2025.102733.