CHRIST
(DEEMED TO BE UNIVERSITY)
BANGALORE · INDIA

Notice for the PhD Viva Voce Examination

Ms Anila Rose Cherian (Registration Number: 1940077), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Friday, 5 May 2023 at 3.00 pm in the Council Room, Ground Floor, Central Block, CHRIST (Deemed to be University), Bangalore Central Campus, Bengaluru - 560029.

Title of the Thesis	:	**Modification of Carbon Based Electrodes as Robust Scaffolds for Electrochemical Sensing of Vitamins and Hormones**
Discipline	:	**Chemistry**
External Examiner (Outside Karnataka)	:	**Dr A S Achalkumar** Professor Department of Chemistry IIT Guwahati Guwahati - 781039 Assam
External Examiner (Within Karnataka)	:	**Dr Suvardhan Kanchi** Associate Professor Department of Chemistry Sambhram Institute of Technology Jalahalli East Bengaluru - 560097 Karnataka
Supervisor	:	**Dr Anitha Varghese** 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

Place: Bengaluru
Date: 21 April 2023

ABSTRACT

Electrochemical sensors are for vitamins and hormones are constructed on employing various modifications (molecular imprinting technology, coating of 2D sheet like materials and also modifying using supramolecular complexing material) on the transducer host, carbon fiber paper electrode (CFP). From our observation, the electrochemical oxidation/reduction current of the analytes studied, intensified significantly on the surface modifications employed over the CFP substrate. Surface morphology was characterized using Field Emission Scanning Electron Microscopy (FESEM), Electron Diffraction X-ray (EDX), X-Ray Photoelectron spectroscopy (XPS), Optical Profilometry and Fourier Transform Infrared Spectroscopy (FTIR). Nyquist plots revealed the least charge transfer resistance at the finally modified working electrodes compared to other control electrodes.

Optimization of experimental conditions such as effect of pH, investigating the reaction mechanism via effect of scan rate, number of cycles for the electrodeposition of the film in order to achieve maximum current response and potential window were studied in detail by using cyclic voltammetry (CV). Quantification of the analytes was performed using Differential Pulse Voltammetry (DPV). Analytical corroboration for real samples were carried out using the finally modified electrode. Therefore, all the works carried out have established simplicity and selectivity in the principle of the novel approach in the development of an ultrasensitive voltammetric sensor for vitamins and hormones studied.

Keywords: *Carbon fiber paper electrode, Vitamins, Hormones, Electrochemical sensors*

Publications:

1. **Cherian, Anila Rose**, Libina Benny, Anitha Varghese, Neena S. John, and Gurumurthy Hegde. "Molecularly Imprinted Scaffold Based on poly (3- aminobenzoic acid) for Electrochemical Sensing of Vitamin B6." *Journal of The Electrochemical Society* 168, no. 7 (2021): 077512.
2. **Cherian, Anila Rose**, Libina Benny, Ashlay George, Uraiwan Sirimahachai, Anitha Varghese, and Gurumurthy Hegde. "Electro fabrication of molecularly imprinted sensor based on Pd nanoparticles decorated poly-(3 thiophene acetic acid) for progesterone detection." *Electrochimica Acta* 408 (2022): 139963.
3. **Cherian, Anila Rose**; Keerthana, P; Bhat, Vinay S; Sirimahachai, Uraiwan; Varghese, Anitha; Hegde, Gurumurthy, "Cherian, Anila Rose; Keerthana, P; Bhat, Vinay S; Sirimahachai, Uraiwan; Varghese, Anitha; Hegde, Gurumurthy" *New Journal of Chemistry* 46 (2022): 19975-19983.
4. **Cherian, Anila Rose**, Libina Benny, Ashlay George, Anitha Varghese, and Gurumurthy Hegde. "Recent advances in functionalization of carbon nanosurface structures for electrochemical sensing applications: tuning and turning." *Journal of Nanostructure in Chemistry* (2021): 1-26.