VIRTUAL SEMINAR
Friday, 17.9.2021 at 10:00
MPŠ Seminar 2

Electrochemical detection of Benzenediols

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The electrochemical detection of benzenediols, Catechol (CC) -1,2 (ortho) dihydroxy benzene, Resorcinol (RS) -1,3 (meta) dihydroxy benzene and Hydroquinone (HQ) -1,4 (para) dihydroxy benzene has been investigated.

Volatile Toxic Organic compounds (VTOC) pose a risk to human health since exposure to these chemicals ranging from mildly intoxicating such as ethanol to extremely toxic and carcinogenic such as formaldehyde is inevitable in everyday scenarios. Some of these compounds are capable of causing severely detrimental effects in very low concentrations and thereby timely and accurate detection of VTOC's is a critical issue that needs to be tackled. In particular, all aromatic compounds are classified as possibly carcinogenic by the Environmental Protection Agency (USA) and other regulatory bodies across the planet.

Electrochemical sensors satisfy the key requirements of a good sensing setup: good accuracy, fast response, repeatability, sensitivity, selectivity, scalability and low cost. The use of Screen-Printed Electrodes (SPE) with certain modifications allows for the electrochemical detection of some VTOC's with all of the above criteria being met.

Our focus will be on the detection of benzenediols using SPE's modified with carbon-supported precious metal catalysts, such as platinum and gold on a suitable carbon support. The catalysts show good organic redox activity and were able to selectively detect all benzenediols using an array of electrochemical techniques such as cyclic voltammetry (CV), chronoamperometry (CA) and simultaneous selective detection was also observed using differential pulse voltammetry (DPV). The result showed both qualitative and quantitative detection of one of the target chemicals with relatively low interference observed due to the presence of the other two chemicals in the same analyte solution.

Kindly invited.