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COMPARISON OF ELECTROCHEMICAL SYSTEMS FOR SENSING REDOX ACTIVE MOLECULES

Abnormal amounts of ascorbic acid (AA), uric acid (UA), and dopamine (DA) can cause and be symptoms of various disorders. DA could be monitored as a potential biomarker for SARS-CoV-2 infection because it reduces the immune response during infection. Additionally, AA and UA levels also aid in infection prevention. Therefore, monitoring these analytes is in a high demand for diagnosing physical conditions [1-4].
As a result, a simple and cost-effective method for producing self-standing reduced graphite oxide (SRGO) was developed. Scanning electron microscopy (SEM), Energy Dispersive X-Ray Analysis (EDX), and X-Ray Spectra Electron spectroscopy were used to investigate the electrochemical transducer (XPS).
Using voltammetry, the SRGO was used to detect DA, UA, and AA, as well as mixtures of these compounds. The voltammogram curve has three well-defined fully resolved anodic peaks, indicating that SRGO has significantly higher electrocatalytic activity toward the oxidation of analytes than bare carbon materials. It was found that SRGO modified with varying levels of functional groups present on the surface clearly influences analyte determination. The linear response ranges for DA, UA, and AA determination were obtained with a physiological limit of detection (LOD). Furthermore, in comparison to other electrode materials that will be presented, SRGO has high reproducibility and selectivity for determining DA, UA, and AA. The demonstrated capabilities can help diagnose metabolic abnormalities and detect infectious diseases in biological samples.

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Primary author: Mrs REINIKOVAITE, Viktorija (State research institute Center for Physical Sciences and Technology)

Co-authors: Mr JARUSAITIS, Ainis (Vilnius University); Mrs ELSAKOVA, Alexandra (University of Tartu); Mr JAFAROV, Ali (University of Tartu); Mrs KERSULYTE, Giedre (Vilnius University); Mrs GALDIKAITE, Ieva (Vilnius University); BARADOKE (BARADOKELAB), PI Ausra; Mr SASO, Shotaro (The International College of Liberal Arts)

Presenter: BARADOKE (BARADOKELAB), PI Ausra