

Preparation of Co₃O₄-ERGO nanocomposite film modified SPE for sensing application

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Uric acid is the final oxidation product of purine metabolism, and in most other mammals the enzyme uricase oxidizes uric acid to allantoin. Higher UA levels may lead to an inflammatory response that contributes to gout or neuroprotective effects. Also, lower levels are detrimental to neurons. Therefore, the determination of uric acid level is required in blood and tissue samples for the diagnosis and treatment of various diseases.

In this study, we report the fabrication of a new nanocomposite consisting of electrochemically reduced graphene oxide (ERGO)-Co₃O₄ nanoparticles (Co₃O₄ NPs) for surface modification of the screen-printed electrode (SPE) and its sensing performance for electrochemical analysis of uric acid. For the purpose of sensing application, Co₃O₄-ERGO composite film was examined the electrochemical signals obtained using various electrochemical techniques. Co₃O₄-ERGO exhibited remarkable electrocatalytic activity towards the oxidation reaction of uric acid, resulting in a wide linear concentration range of 5 – 500 μM. After revealing its other performance characteristics, the presented sensor was successfully applied to the analysis of UA in an artificial saliva sample.