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07 PROJECT

COBALT NANOPARTICLE BASED CARBON ELECTRODE



This project is about the development of non-enzymatic carbon-based electrode, for detection and quantification of nitrite. Green synthesis method is used for synthesis of Cobalt oxide nanoparticles. Sugarcane juice acts as the green solvent (capping agent). Cobalt oxide nanoparticle is used with Graphite powder (as carbon source) to prepare the modified electrode.

Nanoparticles are characterized using XRD, SEM with EDAX, FTIR, TEM with SAED to study the morphological and chemical properties. Electrocatalytic activities of developed electrode were studied using cyclic voltammetry on Electrochemical Workstation (CH-Instrument). The linear dynamic range (LDR) is 0.5 - 1000 μM , and limit of detection (LOD) is 0.3 μM

Features:

- Use of green synthesis method to prepare Cobalt oxide nanoparticles, with sugarcane juice as green solvent and reducing agent.
- A simple process with relatively less chemicals usage; easy to fabricate and cost-effective.
- Detection efficiency on-par with conventional methods.
- There is rapid detection results for nitrite in soil sample, and can be used for on-site analysis.