

Graphene/NiO modified carbon paste electrode for the detection of Dopamine in presence of ascorbic acid and uric acid

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Abstract

Nanoplatelets of graphene (Gr) were obtained by the thermal exfoliation of graphite oxide prepared by modified Hummers and Offeman method. Nickel Oxide (NiO) nanoparticles of crystallite size 6.1 nm with a porous structure was synthesised by solution combustion method (SCS). Carbon paste electrode (CPE) is a homogeneous mixture of graphite powder and silicone oil. CPE was bulk modified with Graphene and NiO nanoparticles (MCPE/Gr/NiO) for the selective detection of dopamine (DA) in presence of interfering molecules such as ascorbic acid (AA) and uric acid (UA). MCPE/Gr/NiO electrode is 100% insensitive to AA signals below 1.0×10^{-3} M which enabled to carry out the quantification of DA accurately in presence of 1000 fold excess of AA. The fabricated electrode shows good reproducibility, stability and linear dynamic range of 0.2 – 300 μ M. Detection limit of DA at MCPE/Gr/NiO is 1.6×10^{-7} M.

Biography

Tony Thomas has completed his PhD at the age of 27 years from Manipal University, Manipal. He is an assistant professor of chemistry, at Deva Matha College, Kuravilangad, Kerala, India 686633. He has published 12 papers in reputed journals and has a teaching experience of five years at undergraduate level.