

Eco-friendly Synthesis of Gold Nanoparticles by Using *B. javanica Blume* Leaves Extract Encapsulated with Graphene Oxide for Selective Electrochemical Detection of Dopamine

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A simple, facile, eco-friendly and rapid synthesis of gold nanoparticles (GNPs) derived from *B. javanica Blume* leaves extract (BJBLE) was successfully developed. The GNPs were formed within 40 sec and it was confirmed by UV-visible spectroscopy. The BJBLE acts as a (strong) reducing and (as well as) stabilizing agent. The Chemical constituents of BJBLE were studied by GC-MS. The prepared GNPs are spherical in shape and the particles size around 25 nm, which was confirmed by HR-TEM. The formation of GNPs and interaction between the plant extract was characterized by XRD and FT-IR. One step preparation of graphene oxide encapsulated GNPs (GO/GNPs) was confirmed by SEM and EDX spectrum. The electrochemical activities of the GO/GNPs modified electrode were characterized by CVs and DPV. The electrochemical results demonstrate notable electrocatalytic activity of the GO/GNPs modified glassy carbon electrode (GCE) towards dopamine detection. The GO/GNPs modified GCE displayed a wide linear range with a low detection limit of 0.03 μM and good selectivity towards dopamine even in the presence of biologically co-interfering substances. The above results suggested that the GO/GNPs modified GCE is very promising and active electrode material for the detection of dopamine for pharmaceutical and clinical applications.

Keywords: Gold nanoparticles, Graphene oxide, *B. javanica Blume*, Dopamine.

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