

Preparation and characterization of tin oxide, SnO₂ nanoparticles decorated graphene.

ABSTRACT

SnO₂ nanoparticles/graphene (SnO₂/GP) nanocomposite was synthesized by a facile microwave method. The X-ray diffraction (XRD) pattern of the nanocomposite corresponded to the diffraction peak typical of graphene and the rutile phase of SnO₂ with tetragonal structure. The field emission scanning electron microscope (FESEM) images revealed that the graphene sheets were dotted with SnO₂ nanoparticles with an average size of 10 nm. The X-ray photoelectron spectroscopy (XPS) analysis indicated that the development of SnO₂/GP resulted from the removal of the oxygenous groups on graphene oxide (GO) by Sn²⁺ ions. The nanocomposite modified glassy carbon electrode (GCE) showed excellent enhancement of electrochemical performance when interacting with mercury(II) ions in potassium chloride supporting electrolyte. The current was increased by more than tenfold, suggesting its potential to be used as a mercury(II) sensor.

Keyword: Nanocomposite; Graphene; Microscopy; Microwave; Tin oxide; Voltammetry.