

Electrochemical oxidation of ascorbic acid using MgB₂-MWCNT modified glassy carbon electrode

ABSTRACT

The electrochemical properties of ascorbic acid (AA) have been studied using cyclic voltammetry technique at the surface of MgB₂-MWCNT mixture modified glassy carbon electrode (MgB₂-MWCNT/GCE) via mechanical attachment method. An enhancement factor of the ascorbic acid oxidation current by about 2 fold compared to the bare electrode was observed. The current was due to diffusion-adsorption process with diffusion activation energy of 2.7kJmol⁻¹. The MgB₂-MWCNT/GCE has a limit of detection of 1.3μM AA with a sensitivity of 76.6 mA M⁻¹AA. Good reproducibility and recovery rate was obtained when determining the presence of AA in real life samples.

Keyword: Ascorbic Acid; Cyclic Voltammetry; Glassy carbon electrode; Magnesium boride; Multiwalled carbon nanotube.