Electrochemical oxidation of L-cysteine mediated by a fullerene-C 60-modified carbon electrode

ABSTRACT

Use of a glassy carbon electrode modified by adhered microcrystals of fullerene-C60 mediates the oxidation of cysteine in the presence of aqueous potassium-containing electrolytes. Under conditions of cyclic voltammetry, the potential for the oxidation of cysteine is lowered by approximately 100 mV and current is enhanced significantly relative to the situation prevailing when a bare glassy carbon electrode is used. Additional mediation occurs when the potential range covered includes that of C60/C60nī redox couples. The sensitivity under condition of cyclic voltammetry is significantly dependent on pH, temperature and C60 dosage. Excellent analytical and/or recovery data are obtained with vitamin pill, cassamino acid (hydrolyzed casein) and for a range of beverages.

Keyword: Electrocatalysis; L-Cysteine; C60; Modified electrode; K+ aqueous electrolyte