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ABSTRACT

A new electrochemical sensor made from nanocomposite of manganese dioxide (MnO_2)-antimony trioxide (Sb_2O_3) was fabricated on polyaniline (PANI) - patterned fluorine doped tin oxide (FTO) electrode (PANI/MnO_2-Sb_2O_3 nanocomposite/FTO) through a simple potentiostatic deposition method. The properties of the nanocomposite were characterized by field emission scanning electron microscopy, X-ray diffraction, electrochemical impedance spectroscopy and other electrochemical techniques. Such nanostructure combines the advantages of PANI (high conductivity and stability) with that of electrocatalytic species (good electrochemical activity). The sensor was applied for simultaneous determination of ascorbic acid (AA) and acetylsalicylic acid (ASA). The linear relationships between their current intensity and concentration were in the range of 6-265.42 nmol L^{-1} and 1.2-228.68 nmol L^{-1} with detection limit (S/N=3) of 1.05 nmol L^{-1} and 0.20 nmol L^{-1}, respectively. Experimental results demonstrated that the sensor possesses high selectivity and suffers no interference from competing species. Moreover, it successfully detected AA and ASA in human urine samples with highly satisfactory results.