

# Maize tassel-modified carbon paste electrode for voltammetric determination of Cu(II)

Mambo Moyo & Jonathan O. Okonkwo & Nana M. Agyei

## Abstract

The preparation and application of a practical electrochemical sensor for environmental monitoring and assessment of heavy metal ions in samples is a subject of considerable interest. In this paper, a carbon paste electrode modified with maize tassel for the determination of Cu(II) has been proposed. Scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR) were used to study morphology and identify the functional groups on the modified electrode, respectively. First, Cu(II) was adsorbed on the carbon paste electrode surface at open circuit and voltammetric techniques were used to investigate the electrochemical performances of the sensor. The electrochemical sensor showed an excellent electrocatalytic activity towards Cu(II) at pH 5.0 and by increasing the amount of maize tassel biomass, a maximum response at 1:2.5 (maize tassel:carbon paste; w/w) was obtained. The electrocatalytic redox current of Cu(II) showed a linear response in the range (1.23 M to 0.4 mM) with the correlation coefficient of 0.9980. The limit of detection and currentconcentration sensitivity were calculated to be 0.13 (0.01) M and 0.012 (0.001) A/M, respectively. The sensor gave good recovery of Cu(II) in the range from 96.0 to 98.0 % when applied to water samples.

Keywords Maize tassel. Carbon paste. Cu(II) . Voltammetry. Electrochemical sensor