

## ABSTRACT

In this paper, we report on the use of ethylene amine (EA) side-wall functionalized single-walled carbon nanotubes (SWCNT) in the synthesis of covalently linked cobalt (II) tetracarboxylphthalocyanine complex (CoTCPC-EA-SWCNT(linked)), the characterization of the linked complex and the application of this complex in the electrocatalytic oxidation of amitrole. UV-vis, FTIR, TEM, Raman and XRD spectroscopies were used in characterization of CoTCPC-EA-SWCNT complex, while cyclic voltammetry, rotating disc electrode (RDE) voltammetry, chronoamperometry and electrochemical impedance spectroscopy were used during the characterization of amitrole on the modified glassy carbon electrode. Thermogravimetric analysis (TGA) was used to confirm the extend of functionalisation of SWCNTs. The catalytic rate constant was  $1.2 \times 10^3 \text{ M}^{-1} \text{ s}^{-1}$  and the apparent electron rate transfer constant was  $3.0 \times 10^{-5} \text{ cm s}^{-1}$ . The linear dynamic range was  $1.0 \times 10^{-5}$ – $1.6 \times 10^{-4} \text{ M}$ , with a sensitivity of  $\sim 0.76 \text{ A mol}^{-1} \text{ L cm}^{-2}$  and a limit of detection of  $0.1 \text{ M}$  using the 3 notation.