

ABSTRACT

Voltammetry, chronoamperometry, scanning electrochemical microscopy and electrochemical impedance spectroscopy methods are used for characterization of a glassy carbon electrode modified with multi-walled carbon nanotubes (MWCNTs)–cobalt tetraaminophthalocyanine (CoTAPc) mixture or sequential drop dry modification technique whereby the MWCNTs are first placed on to the electrode followed by CoTAPc. The sequential drop dry CoTAPc–MWCNTs modified surface gave better catalytic responses with a catalytic rate constant of $2.2 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$, apparent electron transfer rate constant of 0.073 cm s^{-1} , and a limit of detection of $2.8 \times 10^{-7} \text{ M}$. Scanning electrochemical microscopy (SECM) surface characterization (topography and reactivity) further gave proof the better catalytic performance of the sequential drop dry CoTAPc–MWCNTs modified surface.