Determination of tert-Butylhydroquinone Using a Nanostructured Sensor Based on CdO/SWCNTs and ionic liquid

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Tert-Butylhydroquinone (TBHQ) is common antioxidant in food and cosmetics industries, yet it has side-effects and can lead to disadvantages to humans. Hence the determination of different concentrations of this material in various samples is of importance and in this light the present work was focused on the voltammetric analysis of the electro-oxidation behavior of TBHQ. Accordingly a composite of CdO and single wall carbon nanotubes (SWCNTs) was prepared and used to modify an ionic liquid carbon paste electrode (ILCPE) and the resulting electrode was used for the determination of TBHQ. Structure and morphology of the composite was also evaluated through XRD method. Assessments of the electro-oxidation properties of unmodified electrodes and those modified with CdO/SWCNTs and 1,3-dipropylimidazolium bromide (CdO/SWCNTs-1,3-DPIBr-ILCPEs) proved the modification to lead to enhanced sensitivity and selectivity. The CdO/SWCNTs-1,3-DPIBr-ILCPEs had a linear response range and detection limit of 0.1–750 $\mu\text{mol L}^{-1}$ and 0.05 $\mu\text{mol L}^{-1}$ and were applied to the determination of tert-Butylhydroquinone in oil samples.

Keywords: 1,3-dipropylimidazolium bromide, CdO/SWCNTs nanocomposite, tert-Butylhydroquinone analysis, Antioxidant

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