Determination of Bisphenol in Food Samples Using an Electrochemical Method Based on Modification of a Carbon Paste Electrode with CdO Nanoparticle/Ionic Liquid

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An electroanalytical sensor for bisphenol A has been constructed through modification of a carbon paste electrode with a cadmium oxide nanoparticle (CdO/NPs) and 1-methyl-3-octylimidazolium tetrafluoroborate as an ionic liquid (MOITFB). The CdO/NPs were prepared and characterized using FESEM and XRD techniques, and were also indicated to have particle diameters less than 45 nm. The resulting sensor (CdO/NPs-MOITFB-CPE) was used for analyzing the trace level of bisphenol A in the concentration ranged from 0.01 μM to 280.0 μM , and a detection limit of 0.001 μM was determined for that. The signal recorded for bisphenol A using the modified CPE, was found to be improved 3.64 times as compared to unmodified CPEs, and the oxidation potential of bisphenol A was also decreased to 170 mV. Furthermore, the selectivity of the CdO/NPs-MOITFB-CPE to common interfering substances was found to be at a good level. The CdO/NPs-MOITFB-CPE showed a good performance in the determination of bisphenol A in food samples such as tuna fish, tomato paste, and stew with acceptable recovery data.

Keywords: Bisphenol A, CdO nanoparticle, 1-methyl-3-octylimidazolium tetrafluoroborate, Electrochemical food sensor

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