

Title : Development of a Simple Electrochemical Sensor for Determination of Trace Cadmium in Durian

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## ABSTRACT

This research presents the development of a simple electrochemical sensor for determination of cadmium contamination in durian. The sensor was constructed by modifying the surface of a screen-printed carbon electrode with carbon black. Differential Pulse Anodic Stripping Voltammetry (DPASV) was employed as the analytical technique. This study conducted systematic investigations to optimize the electrode surface modification and experimental conditions to improve analytical performance. The parameters examined included the type of modifier used for electrode surface modification volume of the deposited modifier, concentration of bismuth solution, pH of the supporting electrolyte, deposition potential, deposition time and rotation speed of the stirrer. The optimized sensor demonstrated a linear range of 5-100 ppb. The limit of detection (LOD) was 1.3 ppb, and the limit of quantification (LOQ) was 4.3 ppb. The precision of the method, expressed as the relative standard deviation (%RSD) was in the range of 4.51 to 9.38. Application of the development developed method to the determination of durian samples, percentage recoveries of cadmium ranging from 85.30 to 96.56 were obtained. Furthermore, when compared with the standard method based on Graphite Furnace Atomic Absorption Spectroscopy (GFAAS), percentage recoveries of cadmium ranging from 99.45 to 99.60 were found. The results of the analysis showed that there was no statistically significant difference between the two methods at the 99% confidence level, indicating the reliability of the method.

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