Preparation of an Electrochemical Sensor for Rapid Detection of Lead(II) in Blueberries

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Blueberries tend to accumulate lead ions in the plant tissue for the reason that they are grown in acidic soil. The detection of lead ions in blueberries is a very important research objective in the field of food safety. In this work, a highly fast technique for electrochemical analysis was proposed. Nitrogen-doped carbon nanospheres were synthesized for the surface modification of glassy carbon electrodes, and the modified electrodes exhibited a sensitive response to lead ions. By optimizing the potential increments, pulse amplitude, pulse width, accumulation potential and accumulation time, this method can detect lead ions in the range of 10 nM-4 μ M with the detection limit calculated to be 1.05 nM. In addition, the proposed electrochemical analysis has been successfully adopted to detect lead ions in blueberry samples.

Keywords: Lead ions; Electrochemical sensor; Analytical method; Blueberry; Nitrogen-doped carbon sphere

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