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Voltammetric determination of acetaminophen using carbon paste electrode modified by sulfonate carbon nanopartilce

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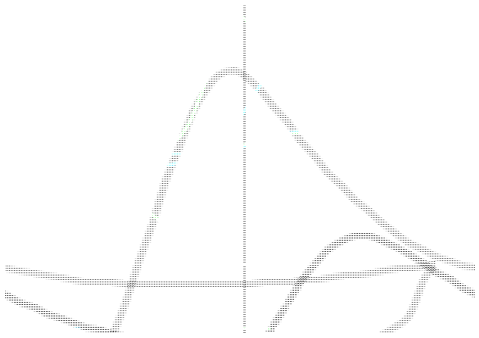
Abstract

Today, the carbon nano-materials have found a great attention. Carbon nanostructures are very interesting for applications such as sensing and energy storage. In this research, the carbon paste electrode was modified with sulfonate carbon nanoparticles (CNPs) for determination of acetaminophen (AC). AC is a popular, antipyretic and non-steroidal anti-inflammatory drug.

The modified electrode has been shown an excellent performance in electrocatalytic activity, sensitivity toward acetaminophen. The CNPs have large surface area and ability to increase the rate of electron transfer. The effect of some parameters such as pH and scan rate was studied in voltammetric response. Differential pulse voltammetry (DPV) was used for quantitative determiation of acetaminophen. A dynamic linear range was obtained in the range of 1.0×10^{-7}-1.0×10^{-3}mol L^{-1}.The modified electrode shows several advantages such as decreasing over voltage, simple preparation method, long-time stability, ease of preparation and regeneration of the electrode surface by simple polishing and excellent reproducibility. The carbon paste modified by sulfonate carbon nanoparticles has been applied for determination of acetaminophen in commercial samples successfully.



Keywords: carbon nanoparticles; carbon paste; acetaminophen; voltammetric sensor