Electrochemical Determination of Vitamin A Based on a Novel Nanoalloy Modified Carbon Paste Electrode

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Preeclampsia has been proposed to occur after a partial breakdown in tolerance during fetal development due to maternal immune maladaptation. A few of the immunomodulatory features of the hormonal vitamin A system have the potential for enhancing immunity during pregnancy. This study proposed a new carbon paste electrode (CPE) that was modified using a nanoalloy (Pt:Co) room-temperature ionic liquid (RTIL) as an extremely sensitive sensor for the voltammetric detection of vitamin A in food specimens. The proposed sensor was found to be effective for vitamin A electro-oxidation in aqueous solutions. As an extremely sensitive electrochemical technique, square-wave voltammetry (SWV) was used for the detection of vitamin A (in submicromolar amounts). The linear response range and detection limit were found to be 0.1 μM to 100 μM and 0.04 μM , respectively. The developed sensor can be used for the detection of vitamin A in tablet and food specimens.

Keywords: Vitamin A; Ionic liquid; Nanoalloy; Electrochemical determination; Square wave voltammetry

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