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Determination of Selenium in infant formula by differential pulse cathodic stripping voltammetry

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Abstract:

Selenium as a nonmetallic chemical element has received high attention of biologists because of its dual role as an essential trace nutrient and a toxic element. This interest has created a need for reliable analytical methods for determination of selenium. In this investigation determination of selenium by differential pulse cathodic stripping voltammetry and the influence of various parameters such as deposition potentials, deposition time. Cu concentration pH, etc. on selenium peak in voltammogram are described. Determination of selenium was accomplished in mixture of acetic acid, hydrochloric acid and sodium chloride buffer (pH=1) with a scan rate of 60 mv/s and a pulse height of 100 my by hanging mercury drop electrode (HMDE) as working electrode. The solution was stirred during pre-electrolysis at -350 mv (vs SCE) for 30 s and the potential was scanned between - 350 mv and - 800 mv. The determination limit of the method was 0.005 mg/kg for the sample. The calibration curves were linear in the range of 0-30 µg/L (R2=0.996, p<0.001). Repeatability of the method at concentrations of 30 and 0.5 µg/L were 2.5 and 10.5% respectively.

Keywords:

Selenium ، Infant formula ، Differential pulse cathodic stripping voltammetry

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