

Selective determination of Cr (VI) in infant formulas and evaporated milk by adsorptive cathodic stripping voltammetry

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Abstract A sensitive adsorptive cathodic linear sweep stripping voltammetric (A_d CLSSV) method is developed for the selective determination of ultra trace hexavalent chromium in infant formulas. Five different commercial brands: chicken with vegetables, beef, vegetables with meat, two fruit-based and other five milk-based samples were dry ashes before analysis. This method is based on controlled adsorptive preconcentration of chromium species onto a hanging mercury drop electrode (HMDE) surface. A mixture of monosodium dihydrogen phosphate and disodium monohydrogen phosphate in presence of sodium nitrate at pH ~ 7 was used as supporting electrolyte for the determination of Cr(VI). To establish the optimal conditions for the detection of Cr(VI) in all samples under consideration, various parameters such as accumulation potential and preconcentration time have been examined. The concentration of the analyte was estimated by the standard addition method. The values of confidence intervals and the standard deviations ($n=5$) indicate the good precision and reproducibility of the selected procedure. Concentrations of Cr(VI) found were: 8.83 – 25.27 ng/g in the samples under investigation. By the standard addition method, the recoveries were 96.1–102.4% with SD of 0.48–1.76%. Because hexavalent chromium has an established toxicity and extensive bioavailability; therefore, it is very important to evaluate its content in infant formulas.

Keywords: Adsorptive stripping voltammetry, hexavalent chromium, infant formulas, evaporated milk.
