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Soleyman Moinfar, Gholamreza Khayatian

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Continuous sample drop flow-based microextraction combined with graphite furnace atomic absorption spectrometry for determination of cadmium

Soleyman Moinfar^a, Gholamreza Khayatian^{a*}

^aDepartment of Chemistry, Faculty of Science, University of Kurdistan, Sanandaj, Iran

*Corresponding author:

Tel: +98- 871 660075

Fax: +98- 8716624133

E-Mail: gkhatian@uok.ac.ir and gkhatian@yahoo.com

Abstract

Continuous sample drop flow-based microextraction (CSDF-ME) technique was successfully used as a sample preparation method for graphite furnace atomic absorption spectrometry (GF AAS). In this technique, a few μL of organic solvent is transferred to the bottom of a conical bottom small tube. Then a few mL of aqueous solution transforms in form fine droplets while passing through the organic solvent. At this stage, cadmium - ligand hydrophobic complex is extracted into the organic solvent. After extraction, the small conical bottom tube is transferred to the GFAAS and 15 μL of extraction solvent was injected into the graphite tube by the aim of autosampler arm. Under optimum conditions, an enrichment factor of 123 was obtained for 5.0 mL of water sample. The linear range and limit of detection for cadmium were 0.02–0.5 and 0.0075 $\mu\text{g L}^{-1}$, respectively. The relative standard deviation for 0.05 $\mu\text{g L}^{-1}$ of cadmium in water was 2.8 % ($n = 5$). The relative recoveries of cadmium in tap water, mineral water and Standard Reference Material for leave apple (1515) are 91, 97 and 86%,

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