SEPARATION, PRECONCENTRATION AND SPECIATION OF SELENIUM BY IONIC LIQUID DISPERSIVE MICROEXTRACTION AND ITS DETERMINATION IN WATER AND FOOD SAMPLES USING GFAAS

Mustafa Tuzen, Ozlem Zeynep Pekiner

Gaziosmanpaşa University, Faculty of Science and Arts, Chemistry Department, 60250 Tokat, Turkey
E-mail: mustafa.tuzen@gop.edu.tr

Total concentration does not give enough information about toxicity and biological availability of trace elements. Selenium is known as an essential trace element. Selenium present in different oxidation states in aqueous solution but it mostly exist in Se(IV) and Se(VI). The toxicity of Se(IV) is more than Se(VI) (1, 2). Ionic liquids have used in green extraction methods in recent years.

In this study a new selenium speciation procedure have been optimized. Ashing and atomization temperatures for graphite furnace atomic absorption spectrometry (GFAAS) were optimized. Various analytical parameters such as pH, amount of ligand, volume of ionic liquid, etc. were studied. Matrix effects of alkali, alkaline earth, some cations and anions were investigated. Limit of detection (LOD) was found 12 ng L\(^{-1}\). Enrichment factor was 150. Relative standard deviation (RSD) of the method was 7%. The accuracy of the method was confirmed with certified reference materials. Optimized method was applied to water samples for Se(IV) and Se(VI) speciation. Total selenium was determined in microwave digested food samples. The advantages of this method are low cost, sensitive, selective, green extraction and environmentally friendly.

KEYWORDS: Selenium, speciation, ionic liquid, microextraction, water, GFAAS

REFERENCES: