

Abstract

The aim of this bachelor thesis was comparison of selenium extraction efficiency from food supplements which contain various declared forms of selenium. The method of atomic absorption spectrometry with flame atomization was used to determine the efficiency of the extraction.

The first step for the determination of selenium in four real samples was the experimental finding of optimal conditions for selenium determination by flame AAS technique. Optimized parameters included the flame composition, the fuel flow rate, the angle of burner rotation, the horizontal burner position and the spectral range. During the testing the flame composition, higher responses were measured by using air as an oxidant, and therefore acetylene-air flame was used to other optimize and measure real samples.

After optimization of the conditions, the calibration dependence was determined and the basic characteristics of the measurements were calculated. The detection limit and determination repeatability, sensitivity and operating range were determined for selenium determination. The detection limit was 0.12 mg dm^{-3} .

The real samples of the food supplement tablets were mechanically homogenized and transferred to aqueous solutions, which were subsequently analyzed by the optimal conditions. The highest extraction efficiency 52.3% of the organic selenium was achieved in a 0.10 mol dm^{-3} solution of Trizma hydrochloride at pH 9. The highest extraction efficiency of the inorganic selenium 37.3% was measured in sodium hydroxide solution - concentration of 0.01 mol dm^{-3} at pH 12.

Key words

Atomic absorption spectrometry, flame atomization, selenium, optimization