Abstract

The aim of this bachelor thesis was to determine selected elements, specifically iron, manganese, sodium, potassium, calcium, magnesium, barium, copper, zinc, strontium and aluminium in the sample of a spruce wood, taken from a dry tree from an area of South Bohemia. As a suitable and sufficiently sensitive method an atomic absorption spectrometry with flame atomization was used in this bachelor thesis.

Before the analysis optimal conditions for the determination of these elements were experimentally found. The beam height above the burner edge and the acetylene flow rate were optimized depending on the type of oxidant used. Under the optimal conditions, the basic characteristics of the determination of individual elements were determined. These characteristics include mainly the limit of detection and quantification, sensitivity and repeatability.

Optimized methods for determination of the selected elements were further applied for the analysis of real spruce wood samples. These samples were prepared by decomposition of the wood in a microwave device in the presence of nitric acid. In order to suppress interference, the suitable reagents were added to the analyzed samples to determine the selected elements (sodium, potassium, magnesium, calcium, barium). In total, 22 samples of wood of different age obtained from a one-time sample of the spruce trunk were analyzed.

Keywords

Atomic absorption spectrometry, flame atomization, element determination, optimization, characterization, spruce wood