Abstract

The aim of this bachelor thesis was to determine selected elements (Na, Mg, K, Ca, Zn, Se) in plant extracts and juices by atomic absorption spectrometry using different types of atomization.

Each method has been optimized for determination of the mentioned elements. For flame atomization it has been used optimization of height of the primary radiation from the hollow cathode lamp over the edge of the burner. The height was generally between 6.0 and 8.0 mm. Then there have been optimized flow of each component of the flame (acetylene, air, nitrous oxide) and it has been set location of the hollow cathode lamp and the flame. Under the optimized conditions basic characteristics describing the method of the determination of mentioned elements have been measured (LOD for sodium 2.13 μg L^{-1}, for magnesium 2.44 μg L^{-1}, for potassium 11.3 μg L^{-1}, for calcium 15.6 μg L^{-1}, for zinc 6.04 μg L^{-1}, for selenium 0.34 μg L^{-1}).

In the next part of the thesis the optimized methods have been used for measuring concentration of all elements in real samples. After the preparation of the samples including dilution, addition of various reagents etc., they have been atomized by flame in an atomic absorption spectrometer (Na, Mg, K, Ca, Zn) and determined, or converted to a volatile compound (Se) and determined by chemical hydride generation using sodium borohydride. Acquired results have been given in μg L^{-1} and mg L^{-1}. Then the influence of extraction with water and methanol solution on exclusion of elements from each plant has been compared. In case of some elements, resp. plants (determination of potassium in white nettle) it has been approved the original assumption, that the efficiency extraction is achieved by methanol solution. In case of other elements, resp. plants (determination of magnesium in horehound) it has been the opposite case and in other cases the concentration of the element using both types of extraction have been almost the same (determination of sodium in ribwort plantain). Then it has been determined in which plants is the largest representation of observed elements, which is useful especially for nutrition.