Abstract

In this thesis the concentrations of sodium, magnesium, potassium, calcium, manganese, copper, iron, zinc, arsenic, cadmium and lead were determined in medicinal herbs for the preparation of herbal tea infusions. Samples from two competing manufacturers on the Czech pharmaceutical market and samples from an important Czech manufacturer available in regular stores were selected for the analysis. The aim of this work was a mutual comparison of selected products of the given manufacturers in terms of their elemental composition. Experiments involving sampling optimization were performed. Further, the infusion bags were decomposed for selected samples and their elemental analysis was carried out. The applies method included decomposition in a microwave device in the presence of a mixture of nitric acid and hydrochloric acid and analysis of the composition of the prepared solutions using the inductively coupled plasma mass spectrometry technique. The results showed that the concentrations of the elements are of comparable order both according to the type of plant and also according to the manufacturer. The content of heavy metals was also found in tea bags. It was found that the measurement results are more accurate when preparing a mixed sample of ten or more infusion bags. In this work, it was verified that the mass spectrometry method used was suitable for determining the concentrations of all selected metals due to the low detection limits.

Key words

Herbal tea, inductively coupled plasma mass spectrometry, ICP-MS, medicinal herb, metals, microwave decomposition