# Abstract

This bachelor thesis is dealing with determination of antimony in materials modern pyramid-shape tea bags. Possible presence of antimony in these materials, e.g. polyethylene terephthalate (PET) or mixed materials, is caused by using it like catalyst in production of polyethylene terphthalete. The goal of this bachelor thesis is the verification of hypothesis, that antimony is present in materials of pyramide tea bags and that it is released to consumed drink, if higher concentration of antimony is present, and that it could pose a health risk to the consumer.

At the same time, I studied if tea leaves are contaminated by other toxic elements, from which some can result from intesive agricultural production. They can be used as pesticides or be presnet in industrial fertilizers.

In this thesis I examined the content of As, Cd, Cu, Sb and Zn in tea leaves sold in pyramide bags. These pyramide bags were purchased in local supermarkets and shops. The content of Sb in bags was determined too. The applied method included the decomposition of samples in a microwave decomposition device and analysis of the composition of the resulting solution by the ICP-MS method. Determined contents of the investigated elements were expressed like content of element in the sample in dry mass and the results were compared with the available literature.

High concentrations of Sb were found in two out of nine tested teabags specifically of Lord Nelson brand. I tested, whether the Sb is released from teabags into tea extracts. Results of this analysis were negative. The concentration values of Sb were found under the detection level. The content of Cu in tea samples was measured next. The highest concentration of Cu was determined in green and black teas. In contrast, the content of Cu in herbal and fruit teas was low. The content of Zn was not as variable as the content of copper. It seems that the teas with lower content of Cu have also higher amount of Zn. Arsenic was not found in any sample. Values of concentration of Cd were found around hundredths of microgram per one gram of sample or were under the detection level.

# Key words

Heavy metals, antimony, arsenic, zinc, cadmium, copper, *Camellia sinensis*, inductively coupled plasma mass spectrometry, microwave decomposition