

## Abstract

Today, the information about total mercury content in a sample is not enough to know because of different toxicity of various species like inorganic forms such as  $\text{Hg}^+$ ,  $\text{Hg}^{+II}$  and organic bonded mercury in Methyl-mercury, Ethyl-mercury or Phenyl-mercury. Therefore a speciation analysis is needed to do.

The aim of this diploma thesis was to develop and validate a new method for speciation determination of selected mercury compounds. This method comprises a connection of high performance liquid chromatography, electrochemical mercury cold vapor generation as a postcolumn derivatization technique and atomic absorption spectrometer. Using this on-line connection of mentioned techniques, an efficient separation of  $\text{Hg}^{+II}$  and methylmercury was achieved. Reached limits of detection were  $0.3 \mu\text{g}\cdot\text{ml}^{-1}$  and  $0.5 \mu\text{g}\cdot\text{ml}^{-1}$  for  $\text{Hg}^{+II}$  and methylmercury, respectively.

At the end of experimental work, proposed hyphenated technique HPLC-EcMCVG-QFAAS was used for determination of these two mercury compounds in six real tap water samples (Bílý potok, Bílina, Labe, Vltava, Botič, pond Kovošrot). In Bílý potok, inorganic mercury ( $\text{Hg}^{+II}$ ) was identified on the base of identical of retention time compared to standard. Standard addition method was used in both FIA and HPLC arrangements and determined content of  $\text{Hg}^{+II}$  was  $(0.4 \pm 0.1) \mu\text{g}\cdot\text{l}^{-1}$ . The trueness of this result was verified using AMA 254 analyzer by the total mercury content determination. Mercury content in other real samples was under detection limit of proposed method. Therefore, these samples were used just for determination of recovery when they were spiked.