Abstract

This thesis deals with the interference study of the UV-photochemical generation of arsenic volatile species with AAS detection and it searches for a suitable reaction modifier, which would improve sensitivity of the As determination. Interferences were classified into 3 groups according to their influence on the As UV-photochemical volatile species generation. Ni^{2+}, Cu^{2+}, Cl^{-} and merkaptoethanol belong among the negative interferents. HNO_3, Fe^{3+}, ethanol, SO_4^{2-}, TiO_2 and L-cysteine belong among the low-level interferents. Co^{2+}, acetonitrile, triethanolamine, selenite and Bi^{3+} belong to a group, which increases the absorbance of arsenic and could, therefore, be called positive interferents. Concentration of 10 mg l^{-1} of Bi^{3+} significantly increases the level of absorbance of arsenic. This effect was utilized during measurement of calibration dependence and Bi^{3+} ions were used as the reaction modifier. The figures of merit of this method with reaction modifier were obtained. Limit of detection was 18 μg l^{-1}, limit of quantification was 60 μg l^{-1}, sensitivity was $1.144 \cdot 10^{-3}$ l μg^{-1}, repeatability was 4.5 % (relative standard deviation) a linear range was 60 – 500 μg l^{-1}. We achieved eleven times better absorbance by using this reaction modifier compared to UV-photochemical volatile species generation of As without using any reaction modifier.