

ABSTRACT

This thesis describes the optimization of the method for determination of arsenic by the chemical hydride generation coupled with AAS detection in beer samples and raw materials for its preparation. The beer usually contain arsenic at ultratrace level, however, it is necessary to monitor the concentration of this element in the beer. The routinely used method for determination of arsenic is determination by electrothermal atomization. This approach is time consuming, expensive and less sensitive. It has been developer suitable determination of arsenic as a faster and less expensive method.

For this method there was optimized the flow rate of argon to $75 \text{ ml}\cdot\text{min}^{-1}$, the optimum flow rate for the reagents was $4.0 \text{ ml}\cdot\text{min}^{-1}$ and for the sample $5.0 \text{ ml}\cdot\text{min}^{-1}$. 3 % NaBH_4 in 0.5 % NaOH was used as the reducing agent for the determination of arsenic, and HCl diluted 1:1 with distilled water was used to acidify the sample. With this parameter LOD was $0.32 \mu\text{g}\cdot\text{l}^{-1}$ and LOQ $1.05 \mu\text{g}\cdot\text{l}^{-1}$. It has been tested the arsenic determination in samples of barley, malt and potable water as beer raw materials. It has been found that the beer matrix is unsuitable for the hydride generation technique due to a stormy reaction in the gas/liquid phase separator. The effect of pretreatment, which is likely to enhance the effect of some of the interfering substances for arsenic determination, has been examined. Another part of this work was focused on the study of interferences and several elements were described which suppress the value of the measured signal for arsenic. The interference effect was confirmed for selenium, antimony, tin, iron and lead.

Keywords

Atomic absorption spectrometry, chemical hydride generation, interferences, arsenic, beer, malt, barley