ON-LINE SILICA TRAPS AND ATOMIZERS AS ALTERNATIVES TO ET AAS

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Silica tubes play an important role in atomic spectrometry. Their common use as heated silica tube atomizer for HGAAS is a well-known robust and yet economical analytical application. Silica tubes have also been used to enhance sensitivity for flame spectrometry for some volatile elements such as Cd, Zn, Pb, etc.

Our group has been working on several types of silica tubes for sensitivity enhancement. One stream involves the use of slotted silica tubes employed in conjunction with flame spectrometry. This device is not only functional for simultaneous enhancement in flame AAS signals, but can also be used in preconcentration mode. Analyte species trapped on the inner surface of the silica tube can be reatomized by altering the flame composition momentarily. Sharp signals obtained have a character very similar to those observed in HGAAS as pre-peaks. Another attempt has been made in order to tame the well-known pre-peaks in HGAAS. By controlling the surface temperature of on-line silica tubing placed prior to atomizer can be used to trap the species volatilized by a conventional hydride generation system. The revolatilization of analyte species can be realized by using a properly adjusted temperature and a well-designed carrier gas mixture. In this paper, the analytical behaviour of such an on-line trap used for Pb determination will be described. The device is simple, economical and can be operated at concentration level of ng/L. In addition the possibilities of employing such a device as a ETV prior to ICP-AES or ICP-MS will be discussed.

PROVIDING THE ACCURACY OF SMALL CONTENTS COMPONENTS DETERMINATIONS

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Keywords: accuracy, standard reference materials

The problem in obtaining of the accurate results in the quantitative determination of the low contents of components, especially in analytically complicated objects, is well known. The efficiency of such well-known ways of the systematic errors elimination as the method of additions, the blank experiment and the inter-laboratory experiment is not sufficient. The difficulties in obtaining sufficiently precise results of quantitative chemical analysis make it difficult to create the standard reference materials (SMR), necessary to ensure and check the serial analysis accuracy.