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References:

DOUBLE VAPORIZATION IN TWO-STEP ELECTROTHERMAL ATOMIZER FOR ATOMIC ABSORPTION ANALYSIS OF LIQUID AND SOLID SAMPLES


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Key words: two-step atomizer, double vaporization, atomic absorption analysis.

Two-step atomizer with vaporizer purging (TSAVP) [1] makes possible to realize the idea of double vaporization of a sample. The sample is first vaporized in the vaporizer, the vapors transported to cold atomizer-cuvette and trapped inside, and the sample is then re-vaporized into analytical zone [2]. Additional sample transformation occurs during sample vaporization. Gaseous and volatile decomposition products will not, or at least will not be fully trapped in the atomizer-cuvette. In addition, trapping of non-decomposed matrix on the atomizer surface may be in a different way than for the analyte. This way the actual quantity of matrix vaporized into the analytical zone simultaneously with the analyte is reduced before the final atomization and, as a result, interferences will be reduced.

Efficiency of transporting and trapping of analyte and matrix thermal destruction products during double vaporization procedure has been experimentally studied.

The double vaporization technique in the TSAVP has been used for direct determination of Cd and Pb in liquid (biological liquids, high concentrated solutions of different salts) and solid (plant, food, geological, plastic materials) samples. No sample pretreatment or matrix modification has been used during the analysis. Recovery values were closed to 100% and background values were significantly decreased for majority of investigated samples when double vaporization procedure using.

Additionally a possibility of initial solid sample to a number of secondary samples with the same summary metal content and the same metal concentration ratio was studied using TSAVP. A number of solid and liquid samples were successfully vaporized, transferred, trapped and distributed between 8-10 secondary graphite platforms using modified TSAVP with rotating platformed barrel installed in place of the atomizer-cuvette. Cd, Bi, In, Ti, Co, Mn, and Sb were simultaneously vaporized, transferred, trapped, distributed and determined for all the samples. The efficiency of transferring and trapping was 85±5 % for all the metals and samples. RSD values for distribution between 10 secondary platforms varied from 5 to 15 %. These values were decreased to 5-10 % when using internal standard technique. By this way one single solid
or liquid sample may be used for multiple measurements both with single and multielements techniques as well as for repeated measurements for the control of instrumental precision.

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**OBTAİNİNG OF ZEOLİTE TYPE 3A BY MEANS OF İONİC EXCHANGE OF ZEOLİTE 4A**

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Rapid technological development imposes even greater necessity for researching new technologies that intend to substitute the old ones (traditional). One of these technologies is the technology of zeolite, which can be freely characterized as high technology, because the zeolites, according to their chemical composition and structure, enable to solve many technological processes.

The synthetic zeolites has a variety of uses such as in the process of separation and diffusion, adsorption, catalysis, chromatography, membrane process etc. depending on which type of zeolite is examined.

This research applies to the ionic exchange of the zeolite, type 4A, with aqueous solution of KCl in order to produce zeolite type 3A, which is commonly used for separation of water molecules from larger molecule, as heat-isolator, etc.

Operating parameters for ionic exchange are:
- Initial concentration of the KCl is 0,1; 0,2 and 0,3 moldm$^{-3}$
- Time of ionic exchange of 5; 10; 20 and 30 min.
- Temperature of 303 K, 328 K and 353 K.

Considering the amount of K$^+$ exchanged (calculated as K$_2$O), the ionic capacity of zeolite is calculated.

The results obtained clearly indicate that the ionic exchange depends on the initial concentration. It does not depend on the temperature and the time.

**DETERMINATION OF Cr, Ca AND Fe GARNET INCLUSIONS IN DIAMONDS BY OPTICAL ABSORPTION**

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