SOLID SORBENTS FOR ON-LINE PRECONCENTRATION AND FLAME ATOMIC ABSORPTION SPECTROMETRIC DETERMINATION OF ALUMINUM IN ENVIRONMENTAL SAMPLES

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During the last decades aluminum has deserved a considerable attention because of its toxicity to human and animal organisms. Since toxicity of aluminum has been well recognized, various methods of its determination have been developed. Atomic absorption spectrometry with flame atomization (FAAS) has become well established for metals determination in mg/l level. For the environmental samples with aluminum content below μg/l there is a need to apply the preconcentration step in order to achieve the appropriate concentration for the FAAS detection.

In this presentation a simple and fast method based on flame atomic absorption spectrometry detection following on-line preconcentration a micro-column packed with solid sorbents will be described. For the preconcentration of trace amount of aluminum, anion exchange resin or nonionic sorbents modified with ligands were tested in respect to efficiency of sorption as well as elution for different sample compositions. The results were achieved successfully by using XAD-2 and AG MP-1 sorbents modified with Pyrocatechol Violet (PV) and 8-hydroxyquinoline (8-HQ). The main advantage of the sorbents modified with chelating ligands is the possibility to control their capacity and selectivity of sorption by the appropriate choice of loading ligand. Moreover, they do not undergo such large changes in volume of the beads with changes of pH of the samples as it was observed for Chelex-100, for instance.

The influence of various experimental parameters (type and amount of sorbent, micro-column diameter, sample and eluent flow rate) as well as figures of merit will be discussed in respect to evaluate best analytical procedure for the determination of aluminium in ng/l level in environmental samples.