

Development and characterisation of a *drop-on-demand*-generator for sample introduction of very small volumes for plasma-spectrometry

J. Massmann, J.H. Petersen, J.N. Schaper, N.H. Bings

Johannes Gutenberg-Universität Mainz, Inst. für Analytische Chemie, Duesbergweg 10-14,
55128 Mainz, email: bings@uni-mainz.de

Sample introduction in plasma spectrometry is a major bottleneck due to high losses in this step. Conventional pneumatic nebulization is the most common way of introducing liquid samples into excitation sources in inorganic analysis.

In elemental speciation hyphenated techniques, especially those based on the combination of capillary electrophoresis (CE) and plasma mass spectrometry requires additional make-up solvent flows to meet the specifications of conventional systems used for sample introduction into the plasma source. To minimize the risk of contamination and degradation of chromatographic resolution a new strategy for direct and flexible introduction of liquid samples in case of speciation analysis is desired.

Prior investigations have shown that commercially available thermal-inkjet printers can be successfully used for precise handling of small sample volumes. However, such available systems are software-dependent and limited to fixed parameter settings, which is still disadvantageous regarding e.g. flexible volume flows and adjustable droplet diameters.

In this poster we present a new approach in nebulization of liquids via stand-alone thermal-inkjet-print cartridges. This system is capable of highly efficient aerosol generation with reduced and adjustable noise-spectra.

The droplet diameter and the total volume flow rate are adjustable to match requirements of low-flow hyphenated techniques. The novel system will be characterized and the achievable analytical figures of merit of such a DOD-nebulizer combined with a quadrupole ICP-MS will be outlined.