Fundamental characterisation of a new *drop-on-demand* aerosol generator: introduction of single droplets into plasma excitation and ionization sources

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Inductively coupled plasma mass spectrometry (ICP-MS) combined with different chromatographic or electrophoretic separation techniques is a powerful and common tool for elemental speciation analysis. However, the design of the interface used for hyphenating the separation device with the ICP influences, and thus limits, the analytical figures of merit of the developed method. Due to low eluent volume flow rates, the capability of efficient nebulisation of very small liquid volumes is one indispensable prerequisite for the selection of an appropriate tool and in many cases conventional pneumatic low-flow nebulisers are used to serve this goal. Still, the addition of make-up solvent flows is in most cases needed to meet the specifications of such nebulisers. Other drawbacks of such systems, which also limit the achievable power of detection, might be the noise and signal fluctuations generated by such nebulisers, as well as relatively broad droplet size distributions. The latter often necessitates the use of spray chambers, which additionally compromises the overall aerosol generation efficiency.

In a new approach for a micro-flow nebulizer we present a novel system, which is based on thermal inkjet printing technology. The so called "*drop-on-demand aerosol generator*" is micro controlled, uses a modified "stand alone" printer cartridge for aerosol generation and is capable to dose sample volumes in the pL-range. The drop diameter and the dosing frequency are adjustable, as well as the number of used dosing nozzles. This allows effective droplet generation over a wide range of flow rates.

In this poster we present a fundamental characterization of the novel *drop-on-demand* aerosol generator in both individual and continuous droplet generation modes. Data on the achievable precision regarding the droplets' size, volume and size distributions will be presented.