

Poster

A new approach to determining the particle transport efficiency of ablation cells

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Transport efficiency is a fundamental factor in developing the ICP-MS method. The transport efficiency is calculated as the ratio of the analyte amount present on the sample to the amount of analyte reaching the detector. Transport efficiency can be determined for both nebulizer and laser ablation sample introduction systems. Each of these conventional methods have certain limitations, e.g., direct weighing does not describe the whole system, but only the nebulization efficiency; particle size method, and particle frequency method rely on concentrations and sizes of nanoparticles reported by the manufacturer, which may deviate slightly from reality.

This poster presents a new method for determining the transport efficiency of LA-ICP-MS systems. It is based on the precise dispensing of small volumes of nanoparticle suspension using a piezoelectric dispenser and subsequent analysis of the deposited droplets using scanning electron microscopy as a reference method to determine the actual amount of nanoparticles. As the next step IR-LA-SP-ICP-MS analysis was performed. The transport efficiency is calculated as the ratio between the nanoparticles incident on the detector in the ICP-MS system and the number of nanoparticles determined by scanning electron microscopy. Our approach should provide more accurate, correct, and robust results than conventional methods for determining transport efficiency.

Keywords: IR-LA-SP-ICP-MS, Transport efficiency, nanoparticle counting

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