POSTER Direct Analysis of Gold and Silver Nanoparticles of Different Sizes from Dried Droplets Using Substrate-Assisted Laser Desorption Single Particle-ICP MS

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Summary

This contribution deals with the determination of gold and silver nanoparticles by Substrate-Assisted Laser Desorption Inductively Coupled Plasma Mass Spectrometry (SALD ICP MS). Water suspensions of the both silver and gold nanoparticles of different sizes (20, 40, 60 and 80 nm) were deposited onto a polyethylene terephthalate glycol (PETG) plate using a commercial micropipette. After the evaporation of the solvent the PETG plate was transferred into the commercial ablation chamber. Dried droplets which contained nanoparticles were irradiated by Nd:YAG laser (213 nm). Ablated nanoparticles were carried from the ablation chamber by helium into the ICP plasma and analyzed by mass spectrometer in a single particle mode. In order to gain the highest transport efficiency of each nanoparticle size, the conditions of analysis including laser fluence, laser beam scan rate and carrier gas flow rate were optimized. The advantages of the developed method are low sample volume consumption, possibility of the archiving of the sample and outstanding sensitivity in the order of units of silver or gold nanoparticles.

Acknowledgment

We gratefully acknowledge the financial support of the Czech Science Foundation under the projects GA15-05387S and GA18-16583S and the Ministry of Education, Youth and Sports of the Czech Republic under the projects CEITEC LQ1601 and MUNI/A/1286/2017.

References

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