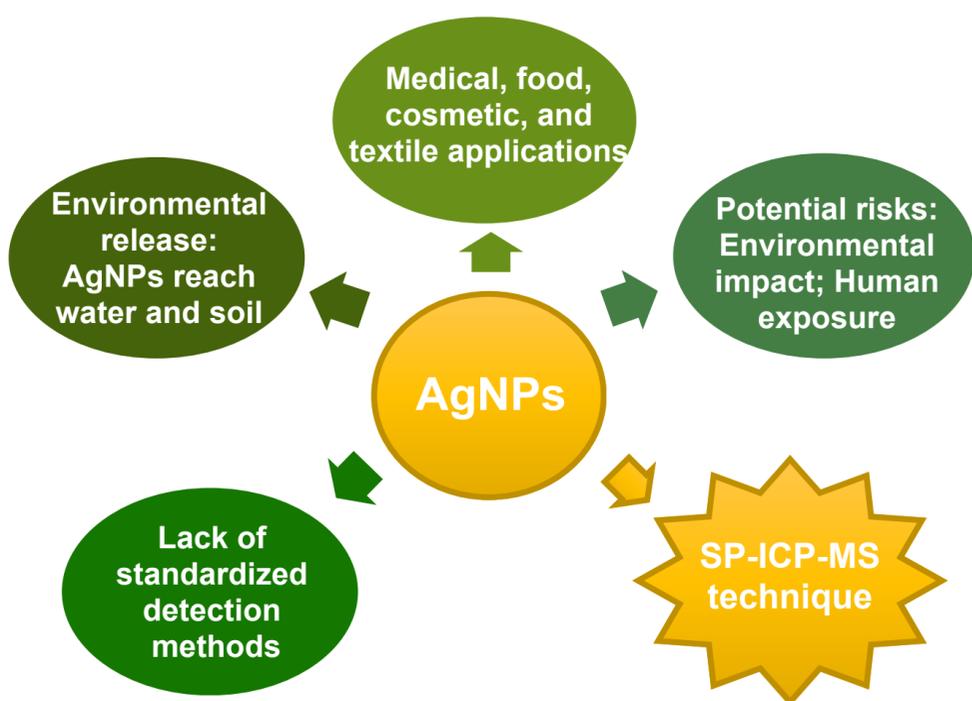


Optimizing SP-ICP-MS for Detection of Silver Nanoparticles in Water: Implications for Environmental Monitoring

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INTRODUCTION



This study aims to optimize a SP-ICP-MS method for the detection of AgNPs in water samples. Moreover, the optimized method will be applied to samples collected from the ABC Paulista region (Brazil).

METHOD

The following aspects were evaluated:

- detection of AgNPs through adequate signal-to-noise separation;
- transport efficiency;
- size limit of detection (LODsize);
- the ability to distinguish nanoparticles of different sizes within the same suspension.

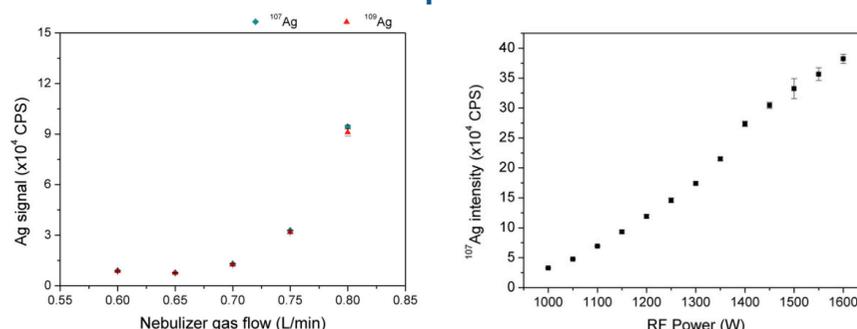
The water samples were collected along downstream sections of the Tamanduateí river and in nearby residential, industrial, and tourist areas, as a proof of concept.

SAMPLE COLLECTION MAP

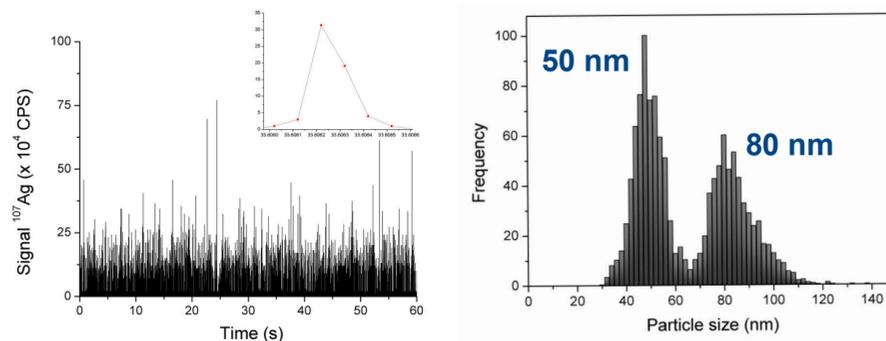


RESULTS & DISCUSSION

Method optimization



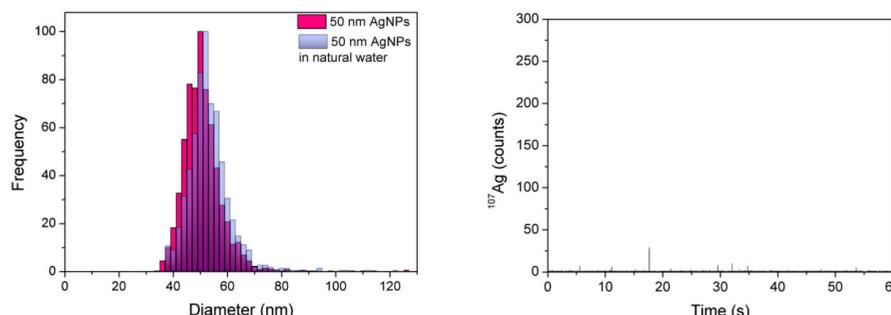
AgNPs detection



LODsize: 10.1 nm

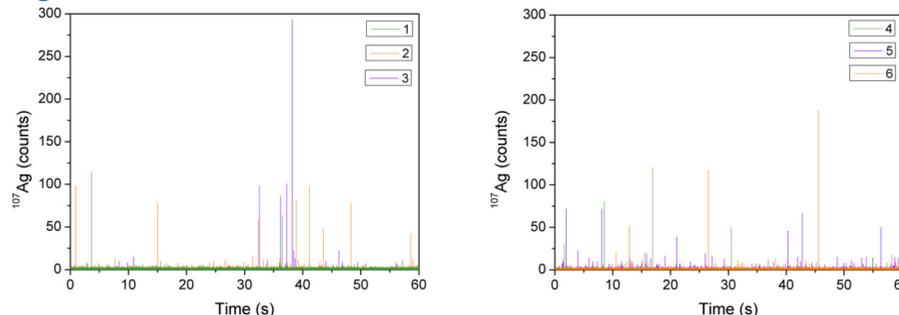
Transport Efficiency: 11.9%

Application to real water samples



AgNPs natural water: 52.1±5.6 nm
AgNPs: 49.9±5.9 nm

Blank



Samples 1,2,3

Samples 4,5,6

CONCLUSION

This study improves analytical approaches for detecting metallic nanoparticles in environmental samples, demonstrating the feasibility of SP-ICP-MS and supporting future monitoring of nanomaterials and emerging pollutants.