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COAGULATION AS SAMPLE PREPARATION FOR DETERMINATION OF SILVER NANOPARTICLES IN AQUEOUS MATRICES

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Introduction

Silver-based Nanomaterials and the Environment

Antimicrobial activity



Industry



Antimicrobial
Clothes



Hospital
supplies

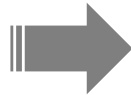


Food
packaging



Cleaning
Products

Increasing and
Indiscriminate use

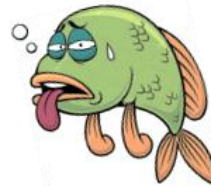


**Environmental
contamination**



**Big Environmental
Problem**

Toxicity to
ecosystems



Unknown
health impacts



Increased bacterial resistance



- ✗ Absence of legislation
- ✗ Failure to monitor the Ag-NMs in water and effluent treatment plants

**Environmental monitoring
is a challenge**

Low concentrations (ng L⁻¹)
Size and Type of NP

SP-ICP-MS
Simultaneous
characterization and
quantification
High cost
***Unviable routine analysis**
***Developing countries**

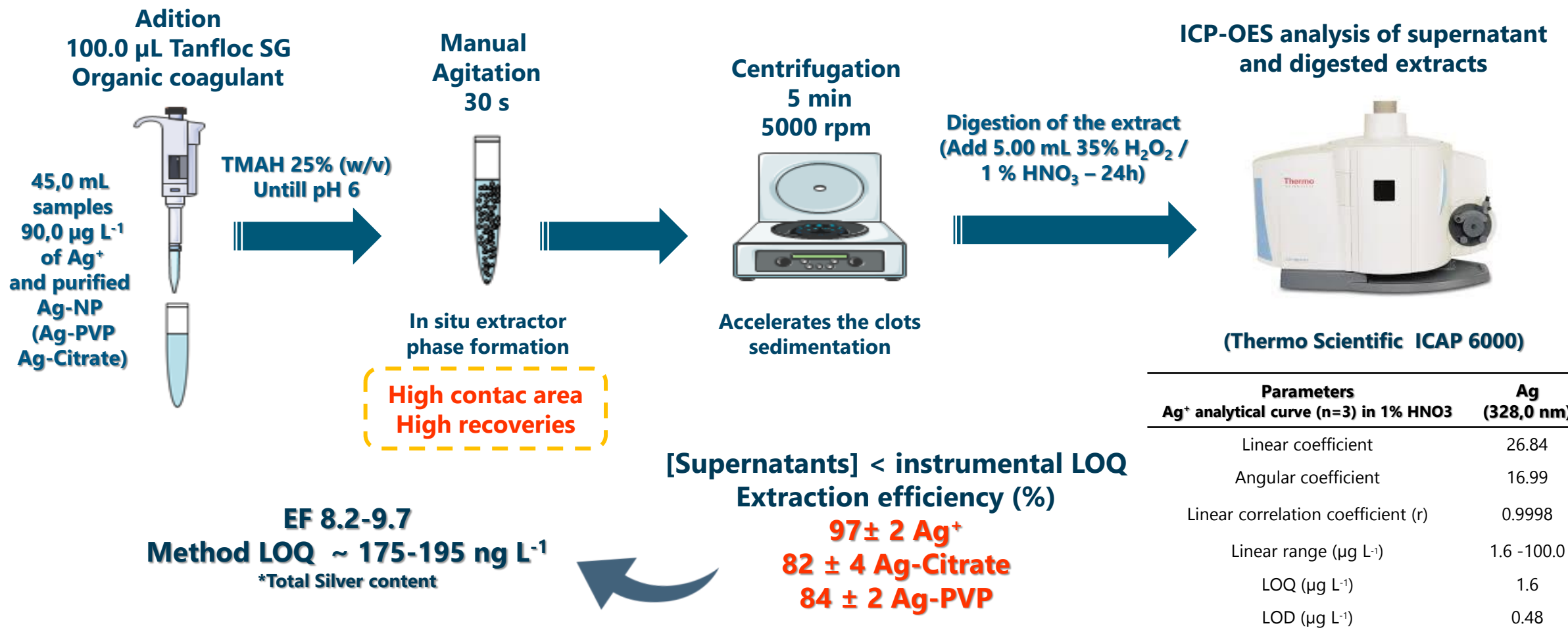
GFAAS and ICP-OES
Despite of the lower sensitivity
Cheapest and can be effective
Pre-concentration methods



Alternative Methods

Methods and Results

Coagulation as pre-concentration method (Removal Ag-NP in WWTP)^{1,2}



Conclusions and Perspectives

Coagulation as sample preparation is a **low cost, simple, easy, and accessible method** for total silver content determination by spectrometry analysis

Future trials using GFASS will be conducted to improve the sensibility and the EFs

Due to the possibility of direct analysis of slurry

No need for the digestion step (with dilute the extract)

By GFAAS the expected EF > 450 and LOQ ~ 4 ng L⁻¹

Distinguish Ag⁺ from silver-based nanomaterials in sample preparation is still a challenge

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