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Discrimination between ionic silver and silver nanoparticles in consumer products using graphite furnace atomic absorption spectrometry

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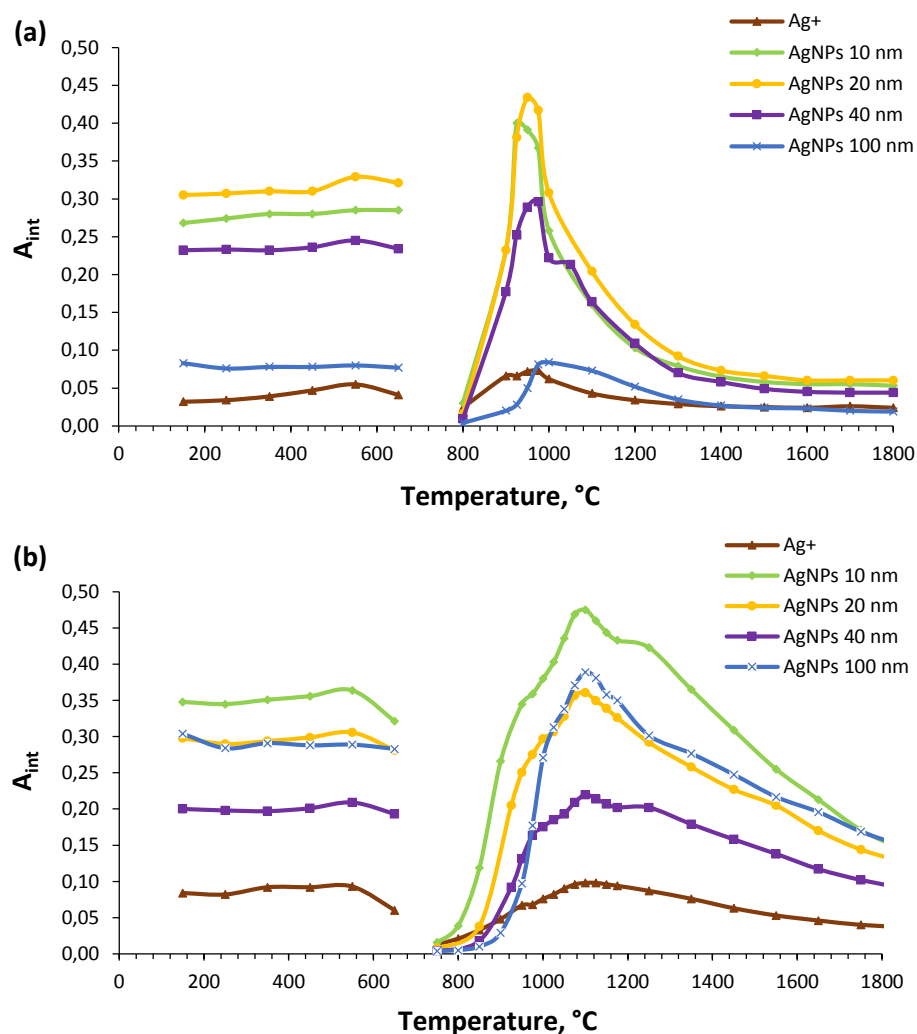


Fig. ESI 1. Pyrolysis and atomization curves of the standards containing $5 \mu\text{g L}^{-1}$ of Ag^+ or AgNPs stabilized with $2 \cdot 10^{-3} \text{ mol L}^{-1}$ trisodium citrate: **a)** wall atomization; pyrolysis curves ($T_{at} = 950^\circ\text{C}$), atomization curves ($T_{pyr} = 250^\circ\text{C}$); **b)** atomization from pyro-coated tube with Omega platform; pyrolysis curves ($T_{at} = 1050^\circ\text{C}$), atomization curves ($T_{pyr} = 350^\circ\text{C}$).

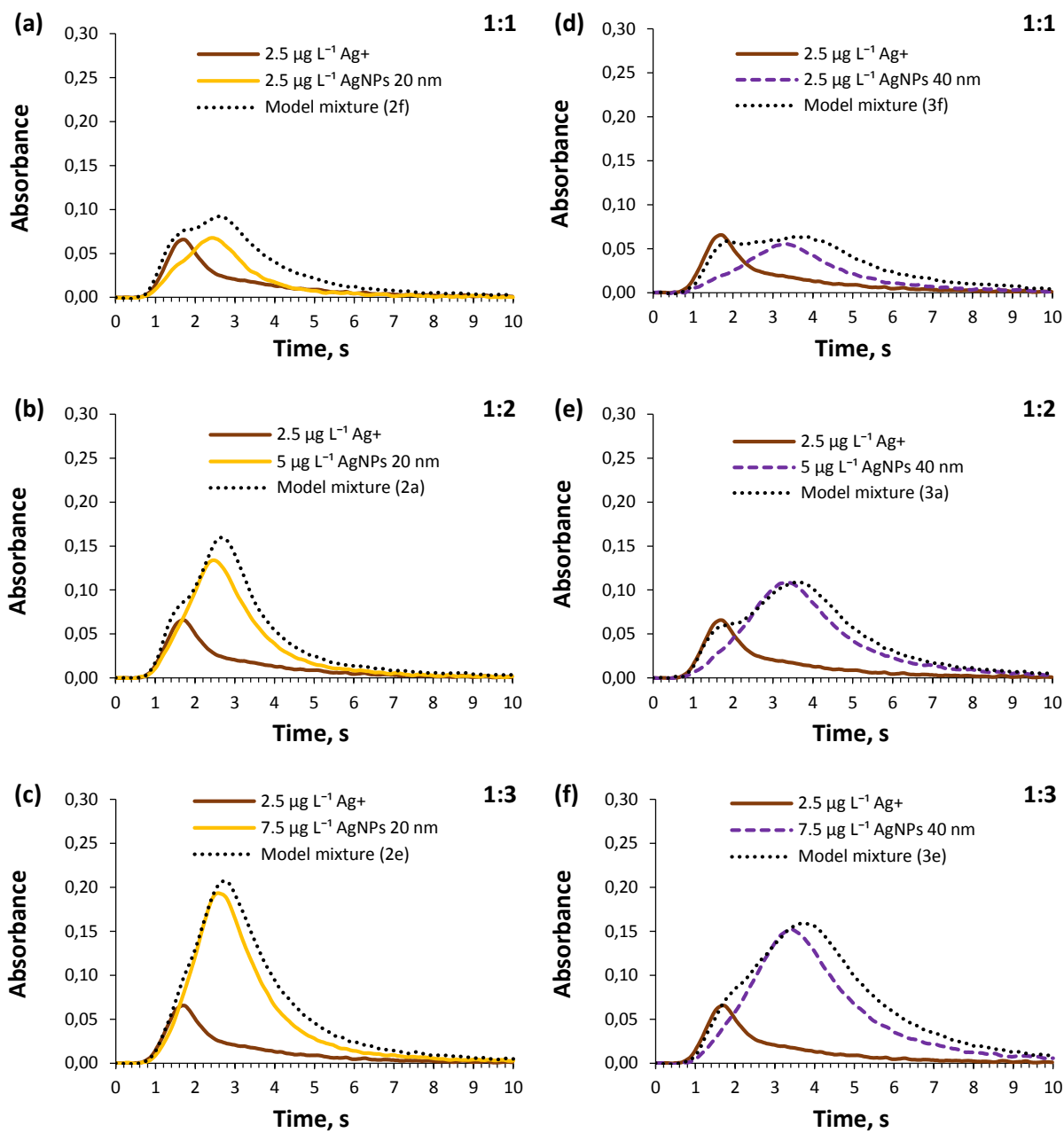


Fig. ESI 2. Atomic absorption signals registered for individual silver form and model mixtures containing Ag^+ and AgNPs of nominal diameter of 20 nm (a-c) or 40 nm (d-f) in different concentrations ratio.

Table ESI 1

The composition of model mixtures tested for simultaneous determination of Ag⁺ and AgNPs.

| Qualitative composition | | | Quantitative composition | | | |
|-------------------------|-----------------|-------------|--------------------------|--|-----|--|
| Series | X | Y | N | Ag ⁺ or AgNPs concentration, $\mu\text{g L}^{-1}$ | | Total silver concentration, $\mu\text{g L}^{-1}$ |
| | | | | X | Y | |
| 1 | Ag ⁺ | AgNPs 10 nm | | | | |
| 2 | Ag ⁺ | AgNPs 20 nm | | | | |
| 3 | Ag ⁺ | AgNPs 40 nm | | | | |
| 4 | Ag ⁺ | AgNPs 60 nm | a | 2.5 | 5.0 | 7.5 |
| 5 | AgNPs 10 nm | AgNPs 60 nm | b | 5.0 | 2.5 | 7.5 |
| 6 | AgNPs 10 nm | AgNPs 40 nm | c | 5.0 | 5.0 | 10.0 |
| 7 | AgNPs 20 nm | AgNPs 40 nm | d | 7.5 | 2.5 | 10.0 |
| 8 | AgNPs 10 nm | AgNPs 20 nm | e | 2.5 | 7.5 | 10.0 |
| 9 | AgNPs 20 nm | AgNPs 60 nm | f | 2.5 | 2.5 | 5.0 |
| 10 | AgNPs 40 nm | AgNPs 60 nm | | | | |