Electronic supplementary information for

Sample Loss in Asymmetric Flow Field-Flow Fractionation Coupled to Inductively Coupled Plasma-Mass Spectrometry of Silver Nanoparticles

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1. T-SEM Images

Transmission in scanning electron microscope (T-SEM) experiments were performed using a SEM ZEISS Supra 40 (Zeiss, Oberkochen, Germany) operated in transmission mode by using a so-called single-unit transmission set-up. For the sample preparation, the *Ag* NP dispersion was sonicated (5 min) in a bath. A volume of 0.5 µL of the undiluted *Ag* NP sample was placed on a carbon foil coated copper grid (Plano, Wetzlar, Germany) and air-dried.

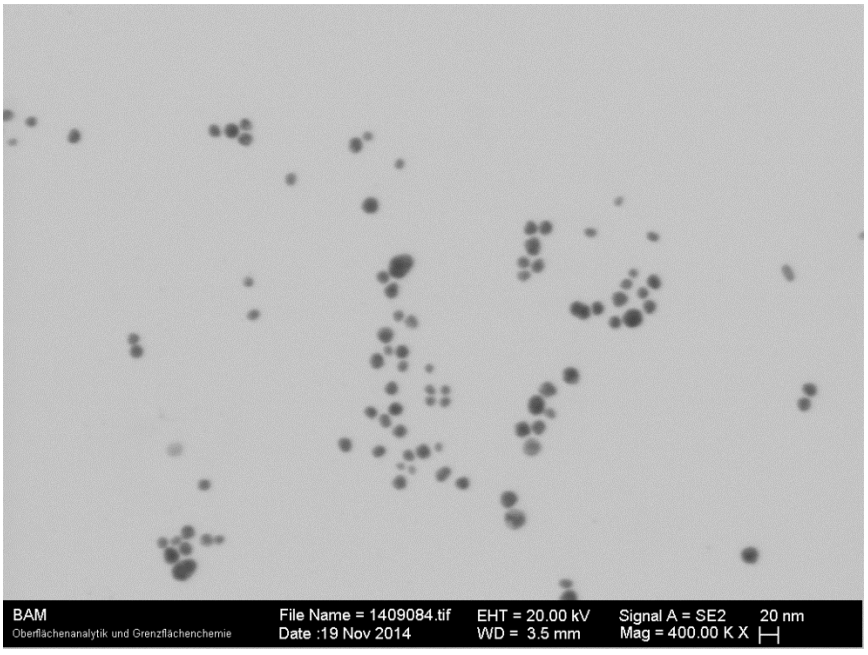

Fig. S1 Representative T-SEM image of the analyzed *Ag* nanoparticles.

A number of 2600 particles were analyzed with the software ImageJ (National Institutes of Health, Bethesda, MD, USA), resulting in an area equivalent particle diameter of 15 ± 5 nm.

2. AF4 scheme

The AF4 flows, such as the detector flow, the cross flow and the slot-outlet flow, are depicted in Fig S2.

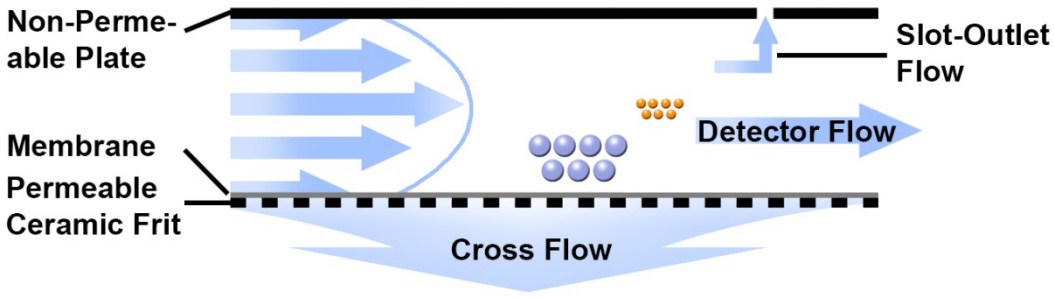

Fig. S2 Scheme of the AF4 mechanism.

Through the slot-outlet shown in Fig. S2, the upper part of the channel flow is removed. Based on the FFF theory, the particle separation takes place in the lower few µm of the channel. Therefore, no sample should be present in the slot-outlet flow.[1]

At the end of each AF4 run, the AF4 channel is purged with a high tip flow of 3 mL min^{-1} in order to remove sample residue from the channel. Simultaneously, a 4-port valve, which is connected to the slot-outlet port, is switched to the purge position. A capillary with an inner diameter of 750 µm is connected to the purge position of the valve. This results in nearly 100 % of the channel flow to leave through the purge flow.

3. Calibration LA-ICP-MS

The integration of the signals for the LA-ICP-MS calibration droplets in Fig. 5 resulted in a linear calibration curve shown in Fig. S3.

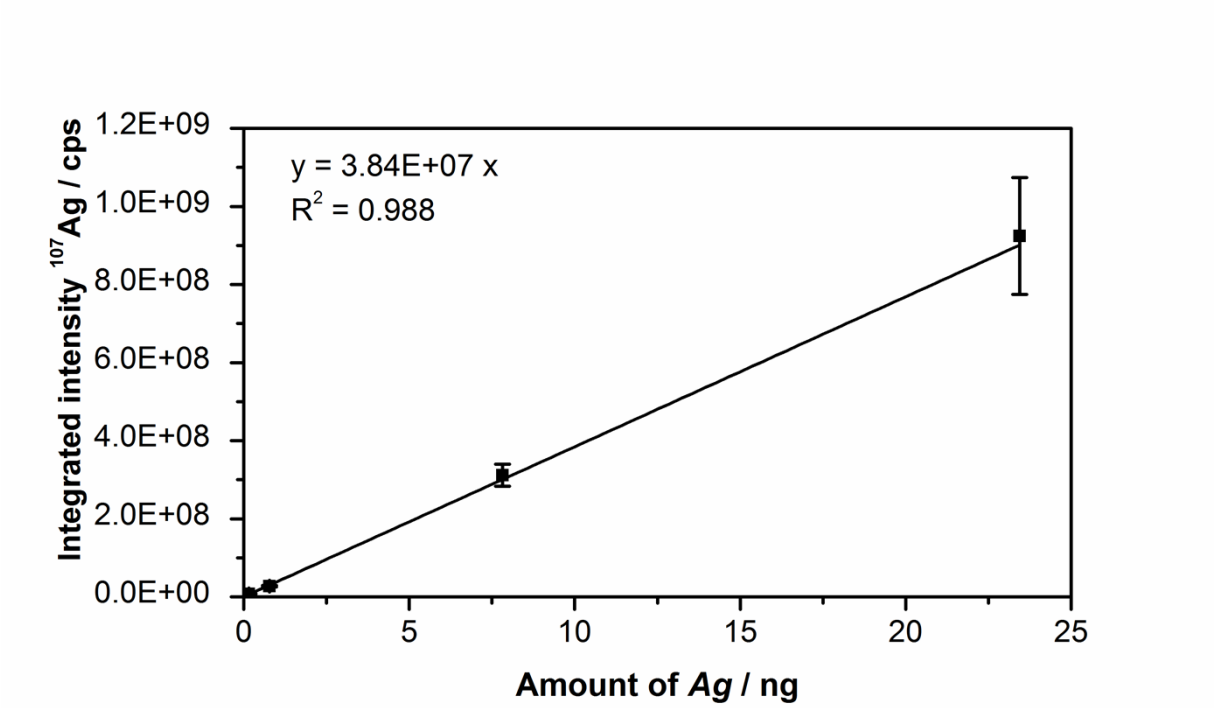

Fig. S3 Calibration curve for quantification of *Ag* residue on the membrane.

A LOD of 4.2 pg was determined for the LA-ICP-MS experiments. The LOD was calculated using LOD = B + 3·sB, whereas B is the average of the background and sB the standard deviation.

Literature

1. J. C. Giddings, in Field-Flow Fractionation Handbook, ed. M. Schimpf, K. Caldwell,J. C. Giddings, Wiley, New York, 1 edn. 2000, vol. 1, ch. 1, p. 17-19.