Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supplementary Information

Development of a Suitable Detection Method for Silver Nanoparticles in Fish Tissue Using Single Particle ICP-MS.

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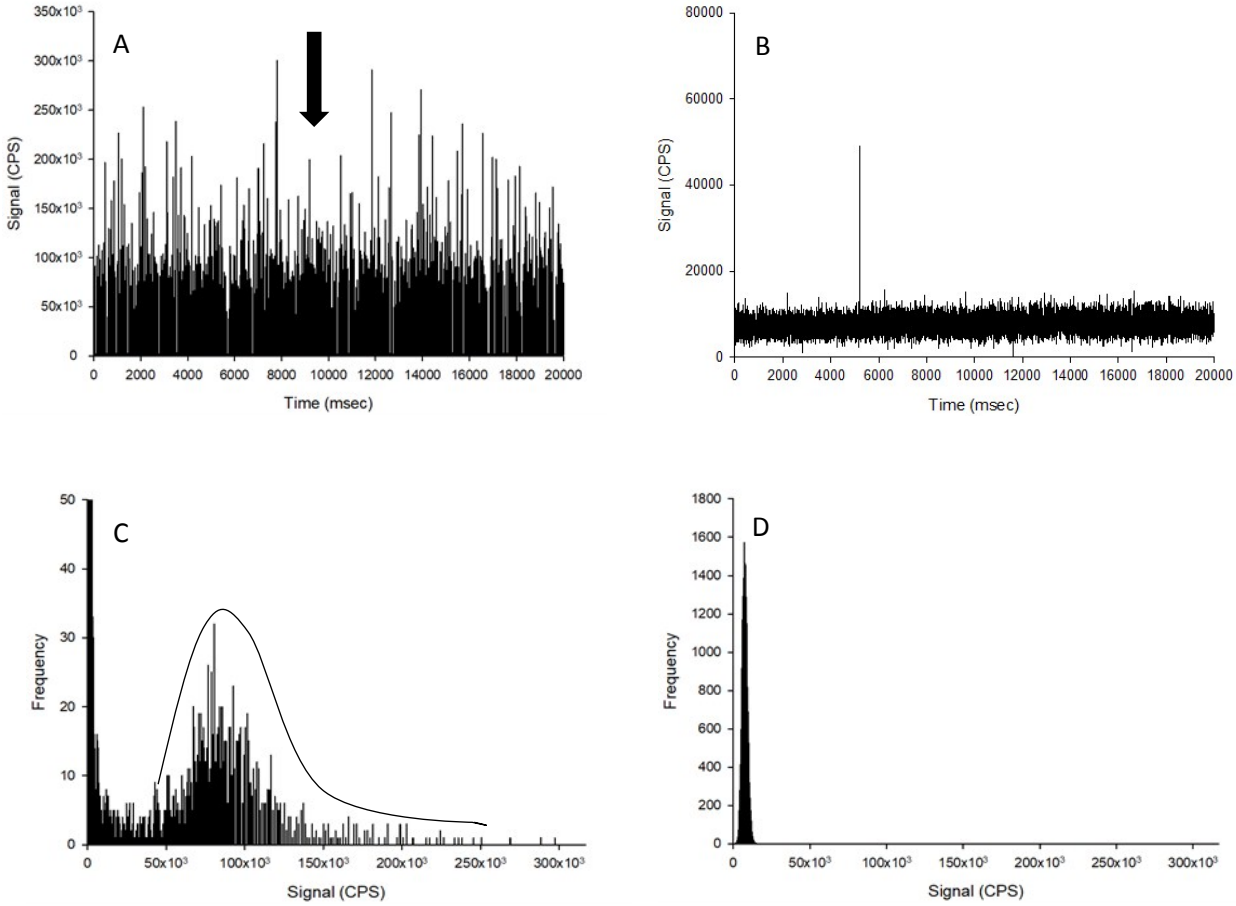

Figure S1. Example time scans of 50 ng L^{-1} Ag NPs (A) or 50 ng L^{-1} as $AgNO_3$ (B) in high purity water. The Ag NP (C) and $AgNO_3$ (D) time scans are converted into signal distributions. The dissolved signal is characterised by a high frequency of a low number of counts. The dissolved signal is subtracted from the intensity signal of the particles to produce a size distribution. The black arrow indicates individual particles detected in a dwell time. The black line (C) indicates the particle distribution.

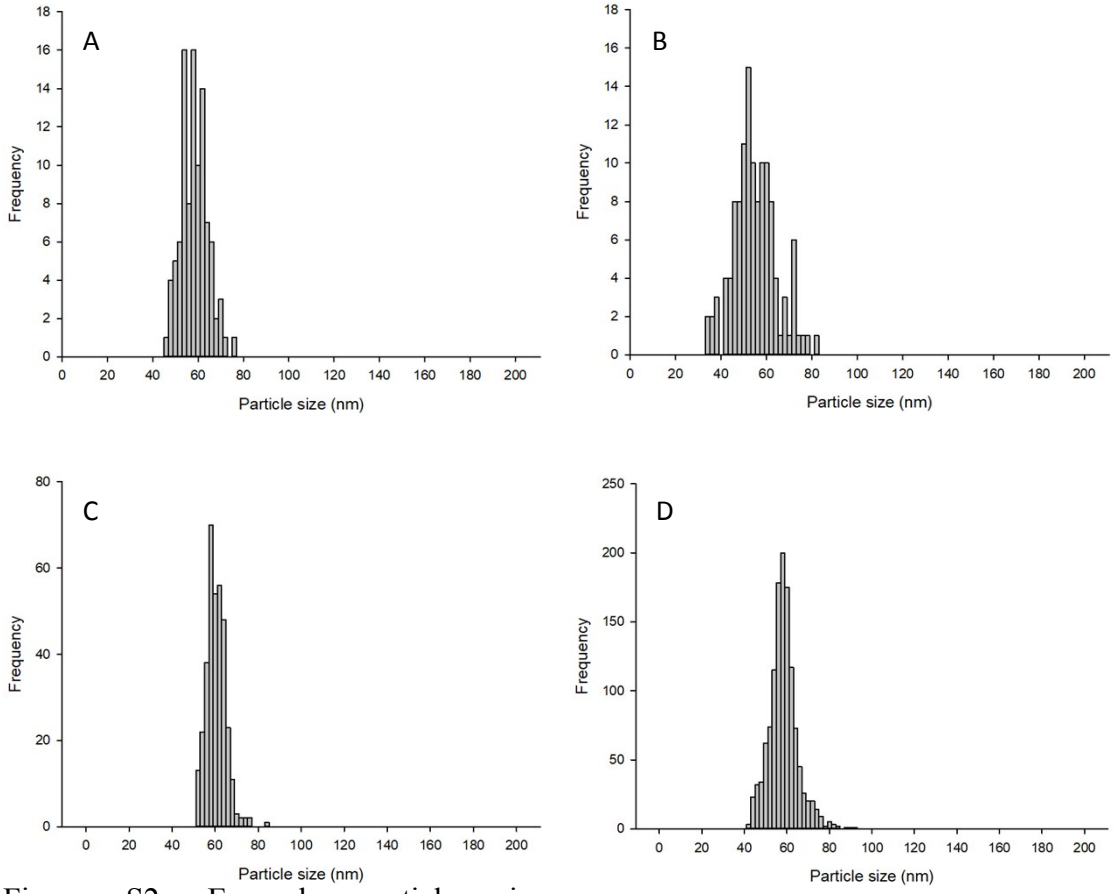

Figure S2. Example particle size distributions of Au NPs (left panels) and Ag NPs (right panels). For Au NPs, by transmission electron microscopy (A) compared to 25 ng L^{-1} samples in high purity water by spICP-MS (C). For Ag NPs, using transmission electron microscopy (B) compared to 50 ng L^{-1} samples in ultrapure water by spICP-MS (D). For spICP-MS, the dissolved signals of Au or Ag were 2000 counts or below, and were taken away from the mass before calculation of the particle size.

Table S1. The determination of particle parameters by spICP-MS in 50 ng L^{-1} dispersions of Ag NPs made in high purity water on three independent days.

Time (days)	Particle mass concentration (ng L^{-1})	Coefficient of variation (%)	Particle number concentration (x10^6 L^{-1})	Coefficient of variation (%)	Mean particle size (nm)	Coefficient of variation (%)
1	42.7 ± 1.5	3.56	42.3 ± 1.3	3.07	56.7 ± 0.2	0.37
2	46.2 ± 4.0	8.67	45.1 ± 1.3	2.91	56.6 ± 1.2	2.16
3	47.1 ± 2.6	5.42	44.6 ± 0.9	1.91	57.2 ± 0.7	1.17

Data are means ± S.D., n = 3 replicate measurements on each day. There was no statistical difference between the particle mass concentrations, particle number concentrations or mean particle size (one-way ANOVA). For reference, the mean particle size as measured by TEM was 58 nm and the expected particle number concentration for a 1 mg L^{-1} suspension was 171 x10^9 L^{-1} as measured by Nanoparticle Tracking Analysis (NTA, Nanosight, LM10).