Single particle ICP-MS combined with internal standardization for accurate characterization of polydisperse nanoparticles in complex matrices

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Keywords

Single particle inductively coupled plasma-mass spectrometry; cerium dioxide nanoparticles; matrix effect; internal standardization; polydisperse nanoparticles

Figures in Electronic Supplementary Information:

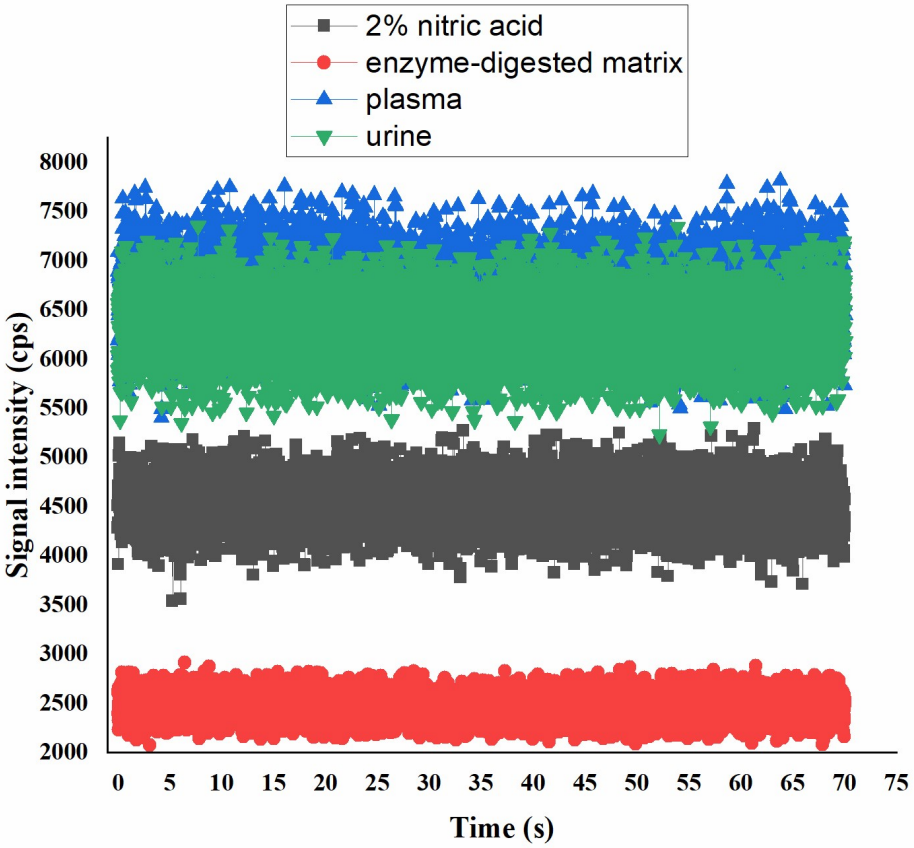
Fig. S1. Time-resolved signal of ^{140}Ce of 1 μg L^{-1} ionic Ce in 2% nitric acid, 500-time diluted enzyme-digested matrix, urine and plasma.

Fig. S2. Time-resolved signal of ^{103}Rh of 1 μg L^{-1} Rh in 2% nitric acid, 500-time diluted enzyme-digested matrix, urine and plasma.

Fig. S3. Information of CeO_2 NPs determined by sp-ICP-MS after the IS correction at a dilution factor of 500: a) comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS (paired t-test, $p < 0.05$); b) particle number concentration of CeO_2 NPs.

Fig.S4. Information of CeO_2 NPs determined by sp-ICP-MS without the IS correction at a dilution factor of 2,500: a) a comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS. * Indicates a significant difference between the two methods through a paired t-test ($p< 0.05$); b) particle number concentration of CeO_2 NPs.

Fig. S5. Information of CeO_2 NPs determined by sp-ICP-MS with the IS correction at a dilution factor of 2,500: a) a comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS (paired t-test, $p < 0.05$); b) particle number concentration of CeO_2 NPs.



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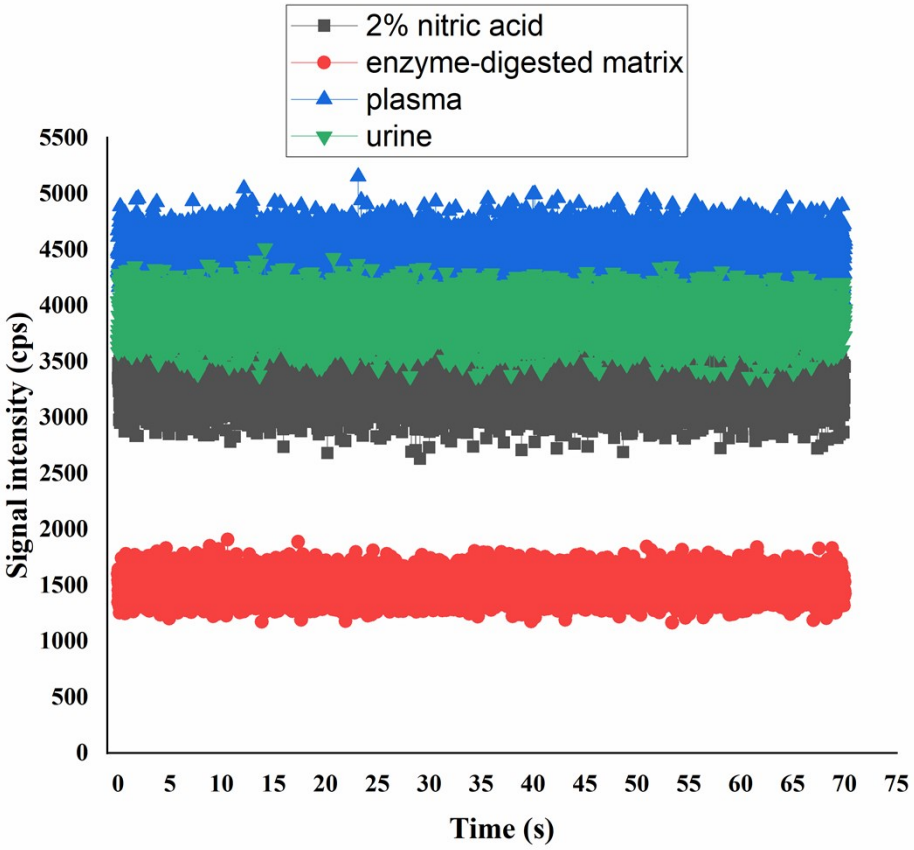

Fig. S2. Time-resolved signal of ^{103}Rh of 1 μg L^{-1} Rh in 2% nitric acid, 500-time diluted enzyme-digested matrix, urine and plasma.

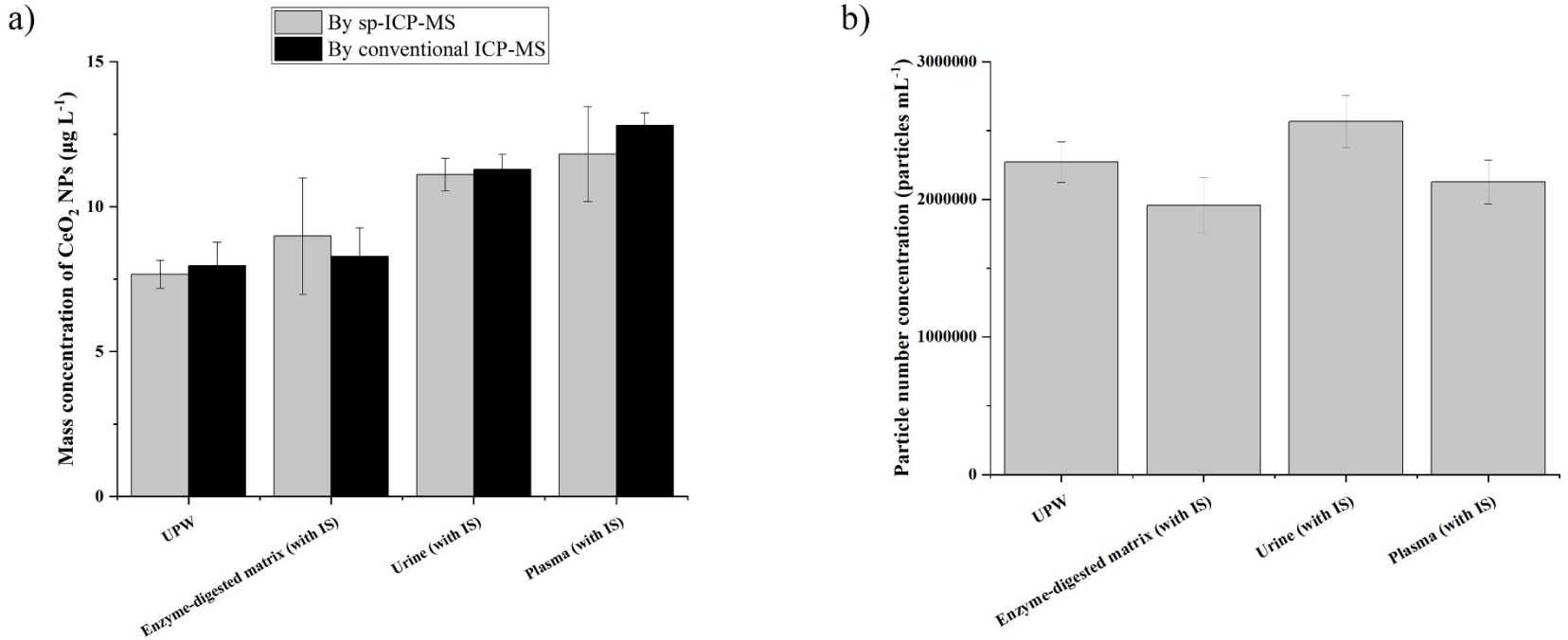

Fig. S3. Information of CeO_2 NPs determined by sp-ICP-MS after the IS correction at a dilution factor of 500: a) comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS (paired t-test, $p < 0.05$); b) particle number concentration of CeO_2 NPs.

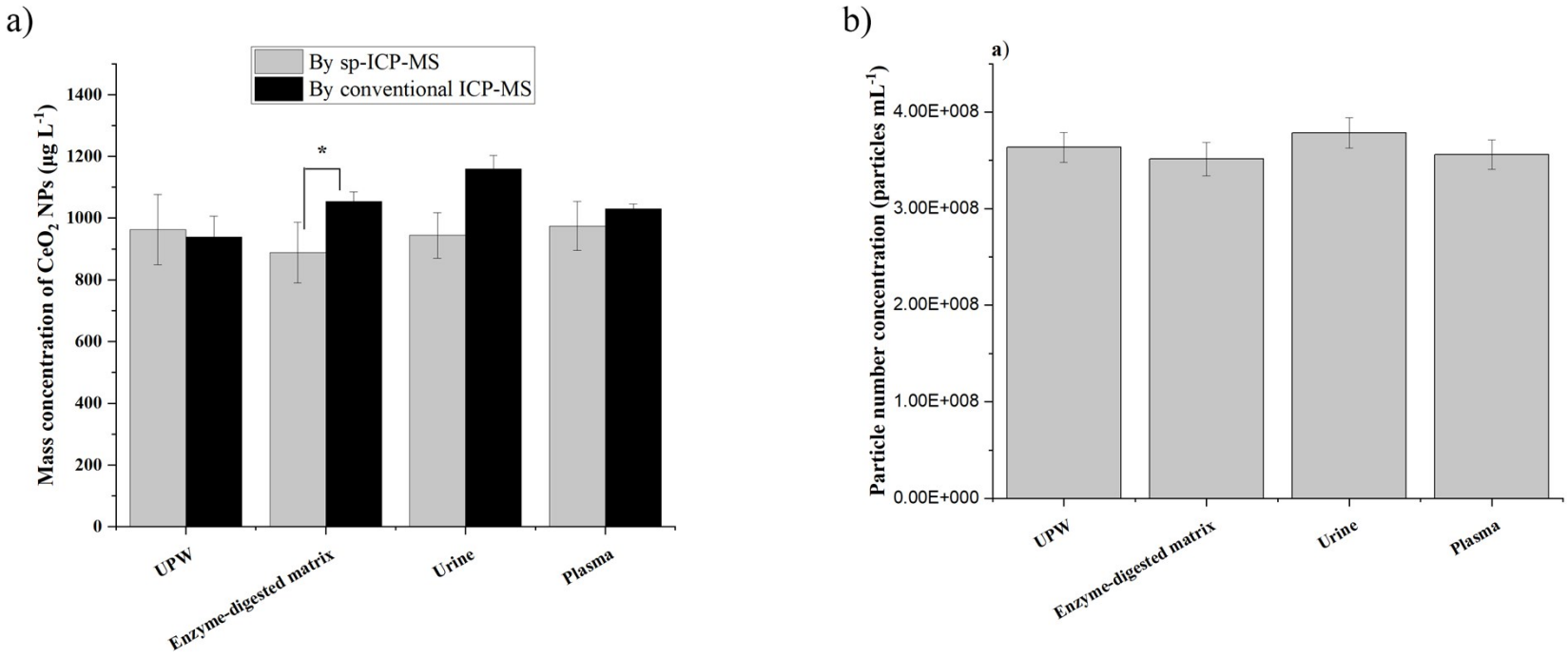

Fig.S4. Information of CeO_2 NPs determined by sp-ICP-MS without the IS correction at a dilution factor of 25,000: a) a comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS. * Indicates a significant difference between the two methods through a paired t-test ($p< 0.05$); b) particle number concentration of CeO_2 NPs.

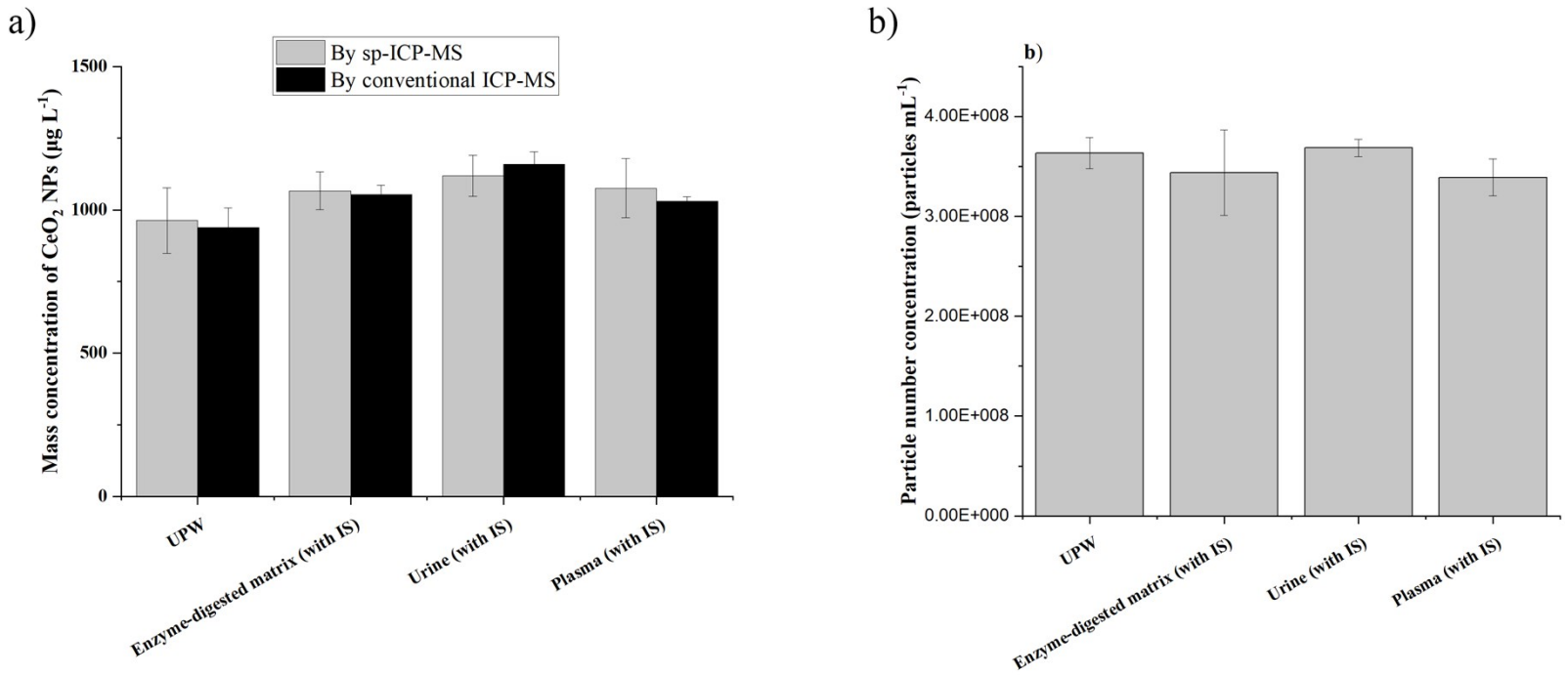

Fig. S5. Information of CeO_2 NPs determined by sp-ICP-MS with the IS correction at a dilution factor of 25,000: a) a comparison on mass concentration determined by sp-ICP-MS and conventional ICP-MS (paired t-test, $p < 0.05$); b) particle number concentration of CeO_2 NPs.