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Speciation of Gold Nanoparticles and Total Gold in Natural Waters: A Novel Approach based on Naked Magnetite Nanoparticles in Combination with Ascorbic Acid

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Abstract

A novel method for AuNPs/total Au speciation based on the combination of magnetic solid phase extraction and graphite furnace atomic absorption spectrometry (GFAAS) is described. Ascorbic acid enabled the quantitative extraction of both AuNPs and Au(III) by naked Fe_3O_4NPs, whereas a selective extraction of AuNPs was achieved in the presence of sodium thiosulfate. Experimental parameters influencing the extraction of both AuNPs and total Au, namely Fe_3O_4NPs mass, L-ascorbic acid concentration, pH, extraction time, sample volume, $Na_2S_2O_3$ concentration and re-dispersion volume of magnetic solid phase

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