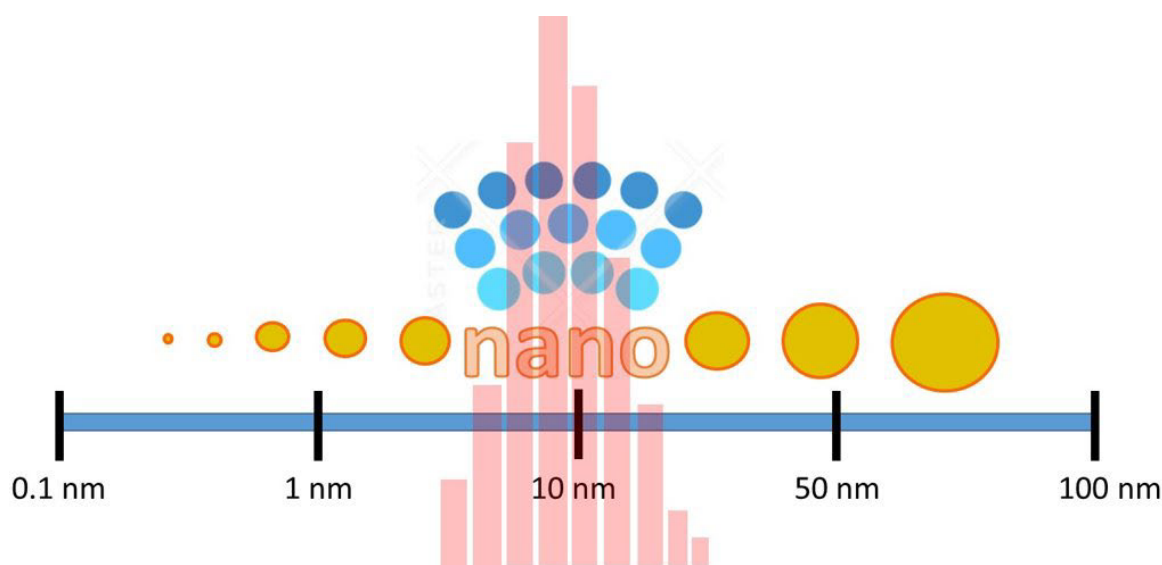


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BOOK OF ABSTRACTS

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Simultaneous enrichment of inorganic and organic species of lead, mercury and vanadium via magnetic solid phase extraction prior to HPLC-ICP-MS determination using a new functionalized patented nanomaterial

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Abstract

A novel magnetic functionalized nanomaterial based on graphene oxide and magnetic nanoparticles (MGO) was prepared and characterized by several spectroscopic and imaging techniques. This material was packed in a magnetic knotted reactor, which was used to develop an online magnetic solid phase extraction method (MSPE) to enrich organic and inorganic species of lead (Pb^{II} , MetPb, EtPb) and mercury (Hg^{II} , MetHg) and inorganic species of vanadium (V^{IV} and V^V) in environmental waters and biological samples. The ultra-trace separation and determination of the species were achieved by high performance liquid chromatography combined with inductively coupled plasma mass spectrometry (HPLC-ICP-MS). The selection of the eluent/mobile phase was carefully studied to ensure the compatibility of the preconcentration and separation systems, resulting in a solution containing phosphoric acid, EDTA, L-Cysteine and thiourea. To the best of our knowledge, this is the first method combining an automatic MSPE with HPLC-ICP-MS for the simultaneous speciation of lead, mercury and vanadium, using a magnetic nanomaterial based on MGO. The developed method was validated by analyzing Certified Reference Materials, and also, by recovery analysis of these species in biological fluids and water samples. The developed method has shown promise for routine monitoring of species in environmental waters and biological fluids.

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