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# DEVELOPMENT OF AN ON-LINE SOLID PHASE EXTRACTION METHOD BASED ON NEW FUNCTIONALIZED MAGNETIC NANOPARTICLES. USE IN THE DETERMINATION OF PT, PD, OS, IR, RH, AG, AU, HG, SB AND BI IN SEA-WATER SAMPLES

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**A** new magnetic nanosorbents based on functionalised magnetic nanoparticles (MNPs) combined with graphene (GO) sheets were synthesised: 1, 5-bis (di-2-pyridyl) methylene thiocarbohidrazide (DPTH-MNP@GO). Several procedures of synthesis were assayed and the products were characterised using different techniques, such as scanning and transmission electron microscopies (TEM and SEM), X-Ray photoelectron spectroscopy (XPS), Fourier transform infrared spectroscopy (FT-IR) and mass spectrometry (MS). DPTH-MNP@GO has been used to develop a simple method for the analysis of trace amounts of metal ions present in environmental samples; the method combines on-line magnetic solid phase extraction (MSPE) with atomic spectrometry. Thus, a flow injection FI-MSPE/cold vapour generation system coupled to ICP OES method for the determination of trace amounts of elements in environmental samples has been developed. A magnet-based reactor designed to contain DPTH-MNP@GO was placed in the injection valve of the FI manifold. The accuracy of the proposed method was verified using certified reference materials and by determining the analyte contents in spiked aqueous samples. Sea water and tap water samples obtained from Malaga (Spain) were also analysed. The determined values were in good agreement with the certified values, and the recoveries for the spiked samples.

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