

عنوان مقاله:

Selective preconcentration of trace amount of Lead using a novel surface imprinting polymer based on graphene oxide-mesoporous silica nanosheets in Fish samples

محل انتشار:

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خلاصه مقاله:

The safe concentration levels of toxic heavy metals in the environment have been seriously increased during the last decades due to human and industrial activities [1]. The long term exposure of heavy metals has a severe detrimental affect on human health [2]. Lead is one of the most toxic elements and possesses bio-accumulative effect, that"s why it is called environmental priority pollutants. Hence it is very important to monitor the levels of lead in environments [3]. Sol-gel process is considered as a promising technique, which consists of the hydrolysis and co-condensation of organosilanes. Mesoporous hybrid functionalized solids can be obtained by adding cross-linker into sol-gel process [4]. Adsorbents prepared by sol-gel process show some advantages, such as high mechanical strength, excellent chemical and thermal stabilities, rigid pore structure and high adsorption capacity, owing to large internal surface area and volume. It is very urgent to develop a preparation method of adsorbent with not only high adsorption performance but also green and environmentally friendly synthesis procedure. In this work, a new and green Pb(II) ion-imprinted polymer was prepared by sol-gel process for removal of Pb(II) ions from aqueous solution. In this research, nanosheets of graphene oxide on mesoprose silica with aminoimide ligand were used for trace separating and preconcentrating of lead. For synthesis of this nano-adsorbent, an amine-imide ligand was synthesized, and certain amount of the ligand and lead nitrate dissolved in a mixture of water / methanol (4: 1) and in the presence of ammonium sulfate as a primer and EGDMA as a cross linker. Prepared polymers were characterized by Fourier transform infrared spectroscopy (FT-IR), X-ray photoelectron spectroscopy (XPS), scanning electron microscope (SEM), and Brunauer, Emmett and Teller (BET). Some main factor such as the interaction time, pH, and amount of adsorbent were selected and their optimum conditions were determined by the experimental design. The optimum condition obtained when 14.46 mg of adsorbent was used at pH value of 6.9 for 32 min. Using a new conventional polymer, measurements of lead II levels in fish samples such as salmon, sardines, yolk fish and tuna fish have been .successfully evaluated using a flame atomic absorption spectroscopy

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