

عنوان مقاله:

Gold nanoparticles-improved liquid phase microextraction followed with flame atomic absorption spectrometry for quantitative analysis of cadmium in real water samples

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خلاصه مقاله:

In this work, a practical and environmentally friendly liquid phase microextraction based on the application of gold nanoparticles modified with (4-mercaptophenyliminomethyl)-2-methoxyphenol, and ionic liquid was followed with atomic absorption spectrometry for preconcentration and quantitative analysis of cadmium. In this sample pretreatment method, a mixture containing 1-hexyl-3-methylimidazolium hexafluorophosphate ([Hmim][PF6]), ethanol, modified gold nanoparticles and chelating agent was rapidly added to the sample solution using a proper syringe. After this step, complex of Cd was extracted into the ionic liquid phase. In order to collect the target analyte at the bottom of the test tube, the sample solution was centrifuged. By using the gold nanoparticles coated with an organic compound, the performance of the microextraction method was improved. The collected enriched phase was diluted and centrifuged again. The supernatant of the enriched phase was introduced to flame atomic absorption spectrometer (FAAS) for quantitative analysis of cadmium. Main parameters affecting the output of the developed procedure were evaluated in details and optimized. In the present technique, a linear dynamic range of 4-60 $\mu\text{g L}^{-1}$, a limit of detection (LOD) of 0.9 $\mu\text{g L}^{-1}$ and a relative standard deviation (R.S.D.) of 3.1% were achieved. Finally, this combined methodology was applied for quantitative analysis of cadmium in different real water samples.

کلمات کلیدی:

Gold nanoparticles, Cadmium, Chelating agent, Water, Atomic absorption spectrometer

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