

عنوان مقاله:

Vortex-assisted Liquid-liquid Microextraction for the Extraction and Preconcentration of Mercury Using Replacement of Zn(II) by Hg(II) in Zinc Dithizonate Complex and its Indirect Determination by Flame Atomic Absorption Spectrometry

محل انتشار:

مجله تحقیقات شیمی تجزیه و تجزیه زیستی، دوره 9، شماره 4 (سال: 1401)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Mir Ali Farajzadeh - *Department of Analytical Chemistry, Faculty of Chemistry, University of Tabriz, Tabriz, Iran.*
Engineering Faculty, Near East University, ۹۹۱۳۸ Nicosia, North Cyprus, Mersin ۱۰, Turkey

Amir Reza Azimi - *Department of Analytical Chemistry, Faculty of Chemistry, University of Tabriz, Tabriz, Iran*

Saeed Mohammad Sorouraddin - *Department of Analytical Chemistry, Faculty of Chemistry, University of Tabriz, Tabriz, Iran*

خلاصه مقاله:

A simple, rapid, and efficient vortex-assisted liquid-liquid microextraction procedure was proposed for the extraction and preconcentration of Hg(II) ions at trace levels in aqueous samples prior to its indirect determination by flame atomic absorption spectrometry. In this study, at first, zinc dithizonate was formed in aqueous solution and then extracted into carbon tetrachloride. Then it was added to sample solution at μL -level and the obtained mixture was vortexed. In this step, Zn(II) in zinc dithizonate was replaced by Hg(II) of aqueous phase and concentration of Zn(II) in organic phase was reduced. After centrifuging, carbon tetrachloride containing dithizonate complexes of Zn(II) and Hg(II) was sedimented. To determine the amount of Hg(II) in the sample solution, the sedimented phase was injected into the instrument and concentration of the remained Zn(II) was determined. Finally, Hg(II) concentration was determined by the difference of the obtained absorbance and the absorbance of a blank (Hg(II)-free aqueous phase extracted by the above-mentioned procedure). Under the optimum experimental conditions, the linear range was obtained in the range of $0.25-15 \mu\text{g L}^{-1}$. The relative standard deviations ($n=6$) for the concentrations of ۱ and $5 \mu\text{g L}^{-1}$ were obtained ۵.۲ and ۳.۳%, respectively. Moreover, the obtained detection and quantification limits were ۰.۰۴ and $0.10 \mu\text{g L}^{-1}$, respectively. Finally, the suggested extraction method was successfully used for the extraction of Hg(II) ions in real water samples.

کلمات کلیدی:

Flame atomic absorption spectrometry, Indirect determination, Mercury, Vortex-assisted liquid liquid microextraction, Zinc dithizonate

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1597016>



