

عنوان مقاله:

Green Vortex-assisted Deep Eutectic-based Liquid Phase Microextraction of Malachite Green from Water Samples

محل انتشار:

مجله تحقیقات شیمی تجزیه و تجزیه زیستی، دوره 12، شماره 1 (سال: 1404)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

This study developed green vortex-assisted deep eutectic based liquid phase microextraction for preconcentration and separation of malachite green from water samples prior to determination with UV-Visible spectrometer. The prepared deep eutectic solvent contains diethyl hexyl phosphate and decanoic acid with the mole ratio of ۱:۲ as the extraction solvent. After optimizing the influential parameters including pH, temperature and vortex time, sample volume and ionic strength were optimized and the optimum values of ۶, ۳۰ °C, ۳۰ s, ۲۰ mL, and without adding salt in which the extraction efficiency of ۹۹.۶۶ % was achieved. Moreover, at optimum conditions, the analytical performance of the method was evaluated. The limits of detection and quantification (defined as ۳Sb/m and ۱۰Sb/m, respectively) of ۳.۰۳۵ $\mu\text{g L}^{-1}$ and ۱۰.۰۱۱.۰۵ $\mu\text{g L}^{-1}$ were obtained for malachite green (MG). The linear dynamic ranges of ۱۰-۶۰۰ ($\mu\text{g L}^{-1}$) and the correlation coefficients (r^2) of ۰.۹۹۳۶ were attained. Moreover, the enrichment factor of ۶۳.۱ was obtained. The relative standard deviation (%) for ۱۰ $\mu\text{g L}^{-1}$ of MG solution was ۲.۵ which showed high precision of the process. The novel combination of green vortex-assisted deep eutectic based liquid phase microextraction and diethyl hexyl phosphate and decanoic acid represented high potential for application in real samples in which the method was successfully applied in water samples with high relative recoveries of ۹۳.۰-۱۰۲.۲ % which confirms significant capability of the proposed method.

کلمات کلیدی:

Vortex-assisted liquid phase microextraction, Deep eutectic solvent, Malachite Green, Water samples

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