عنوان مقاله:

Spectrophotometric Determination of Trace Phenol in Industrial Wastewater and Extracts of Mint and Green Tea after Hollow Fiber Liquid Phase Microextraction with Central Composite Design Optimization

محل انتشار:

مجله تحقیقات شیمی تجزیه و تجزیه زیستی, دوره 7, شماره 3 (سال: 1399)

تعداد صفحات اصل مقاله: 9

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خلاصه مقاله:

In the present study, hollow fiber liquid-phase microextraction (HF-LPME) method was used to preconcentrate trace amount of phenol prior to its spectrophotometric determination. Phenol reacted with ۴-aminoantipyrine (۴-AAP) reagent in presence of potassium hexacyanoferrate (III) and then was extracted into the octanol extractant inserted into the lumen and pores of hollow fibers. Some factors such as concentrations of ۴-aminoantipyrine, potassium hexacyanoferrate (III) and ammonium chloride, the rate of stirring, and extraction time were optimized using response surface method based on the central composite design (CCD). Under the optimum conditions, the limit of detection (LOD) and limit of quantification (LOQ) were obtained as ۱.۵ and ۵ µg L-۱, respectively. Also, the relative standard deviation (RSD %) and enrichment factor (EF) were obtained as ۴.۹ % and ۱۷۴, respectively. In addition, the suggested method was implemented to measure of phenol concentration in some real samples, including wastewater of wood and textile factories, as well as the extracts of mint, and green tea. The accuracy was investigated by the recovery of phenol from real samples in the range of ۸۲.۳ – ۱۱۲%. The results showed that the proposed method is simple, rapid, eco-friendly, and accurate for preconcentration and analysis of phenol.

کلمات کلیدی:

Central composite design, Hollow fiber liquid-phase microextraction, Preconcentration, Phenol, Response Surface Methodology