

# 中空纤维三相液相微萃取-高效液相色谱法测定水中的4种酚类化合物

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## Determination of 4 phenols in water by three phase hollow fiber microextraction coupled with high performance liquid chromatography

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**摘要** 建立了中空纤维液-液-液三相微萃取-高效液相色谱法测定水中4种酚类化合物的方法。实验系统地优化了影响萃取效率的因素(包括有机溶剂种类、接收相浓度、分散相pH值、加盐量、转速及萃取时间)。得到的最佳萃取条件为: 萃取剂为正辛醇,接收相NaOH溶液的浓度为0.09 mol/L,分散相的pH为4,萃取时间为40 min,搅拌速度为600 r/min,NaCl加入量达到100 g/L。在最佳萃取条件下,该方法对苯酚、4-甲酚、2,4-二甲酚和2-萘酚的检出限(信噪比为3)分别为0.4、0.4、1.2和0.4 μg/L,富集因子分别为111.6、129.5、71.0和175.6。在实际环境样品中添加5、50 μg/L水平的4种酚类化合物,其加标回收率为85.9%~119.0%。研究结果表明该方法简便、快速、准确,可用于水环境中酚类化合物的测定。

**关键词:** 中空纤维 三相液相微萃取 高效液相色谱法 酚类化合物 水 环境

**Abstract:** A method was investigated for the determination of 4 phenols in water by three phase hollow fiber microextraction coupled with high performance liquid chromatography. Some factors affecting the extraction efficiency were optimized, such as the nature of organic solvent, the concentration of acceptor phase, the pH value of donor phase, extraction time, stirring rate and salt concentration. The optimized conditions were as follows: 1-octanol was used as the organic solvent, the concentration of NaOH solution as acceptor phase was 0.09 mol/L, the pH value of donor phase was 4, the extraction time was 40 min, the stirring rate was 600 r/min and the NaCl concentration was 100 g/L. Under the optimal conditions, the detection limits (S/N=3) of phenol, 4-methylphenol, 2,4-dimethylphenol and 2-naphthol were 0.4, 0.4, 1.2 and 0.4 μg/L, and the enrichment factors were 111.6, 129.5, 71.0 and 175.6, respectively. The proposed method was applied for the determination of the 4 phenols in real environmental water samples and the spiked recoveries were in the range of 85.9%~119.0% at the spiked levels of 5 and 50 μg/L. The method is simple, rapid, accurate and suitable for the determination of phenols in water samples.

**Keywords:** hollow fiber three phase liquid microextraction high performance liquid chromatography (HPLC) phenols water environment

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