

亲水改性C18填料的制备及其在萃取水中酚类化合物中的应用

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Preparation of hydrophilic C18 material and its application for solid phase extraction of phenols in water

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摘要

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摘要 通过在甲基丙烯酸十八酯(SMA)中加入亲水性单体甲氧基聚乙二醇甲基丙烯酸酯(PEGMEA),以1-正丙醇/1,4-丁二醇为致孔剂,热聚合得到具有一定亲水性的新型C18填料,并将该填料应用于固相萃取(SPE)富集水中的酚类化合物。实验优化了致孔剂的配比、SPE过程中上样溶液pH值、洗脱剂种类等参数。在上样溶液pH为6.0,以5.0 mL乙腈为洗脱剂的优化条件下,5种酚类化合物在0.5~10 mg/L范围内呈良好的线性关系,检出限为0.16~0.47 mg/L。所制备的亲水改性C18材料已成功用于大辽河水样中酚的检测,平均加标回收率为64.33%~92.14%,相对标准偏差为4.2%~6.4%(n=3),证明了该填料对环境水样中痕量酚类化合物富集的可靠性。

关键词: 亲水改性C18填料 固相萃取 富集 酚类化合物

Abstract: A C18 monolithic material with a hydrophilic character was obtained by copolymerizing stearyl methacrylate (SMA) and a hydrophilic monomer poly(ethylene glycol) methyl ether methacrylate (PEGMEA) with porogen of 1-propanol/1,4-butanediol, and the resulting material was used for solid phase extraction (SPE) of phenols in water sample. Several parameters, including the proportion of the porogen, the pH value, the eluent species and the eluent volume during the extraction were investigated. Under the optimized experimental conditions, the linear calibration curves of five phenols were obtained in the ranges of 0.5~10 mg/L, the limits of detection (LODs) ranged from 0.16~0.47 mg/L. The new hydrophilic C18 material was successfully applied to analyze real environmental water samples with spiked recoveries in the range of 64.33%~92.14% with relative standard deviations (RSDs) of 4.2%~6.4% (n=3). The new hydrophilic material indicates great reliability, and it also presented an excellent extraction efficiency for the trace polar phenols in environmental water samples.

Keywords: hydrophilic C18 material solid phase extraction enrichment phenol

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