色谱 » 2010, Vol. 28 » Issue (12) :1200-1203 DOI: 10.3724/SP.J.1123.2010.01200

微波辅助-顶空液相微萃取在线联用-高效液相色谱法测定环境水样中的敌敌畏

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Determination of dichlorvos in water by microwave-assisted-headspace-liquid-phase microextraction coupled with high performance liquid chromatography

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摘要 基于微波辅助-顶空液相微萃取联用(MAE-HS-LPME)这一样品前处理方法,采用高效液相色谱法(HPLC)对水样中的敌敌畏残留量进行了测定。对影响萃取的因素如萃取剂、微波辐射功率、萃取时间、离子强度和样品基质的pH值等进行了考察。萃取条件为: 选用二甲苯作萃取剂,萃取时间为15 min,微波辐射功率300 W,NaCl含量为5%,pH为2.5。在最佳条件下,敌敌畏的检出限(信噪比为3时)为0.96 μg/L,定量限(信噪比为10时)为3.20 μg/L,萃取富集倍数为54,实际水样的加标回收率为87.4%～103%。与传统的前处理方法相比,本方法具有简便、快速、高效、节省溶剂、选择性好、应用范围广的特点。

关键词： 微波辅助萃取 顶空液相微萃取 高效液相色谱 敌敌畏 环境水样

Abstract： A novel method for the determination of dichlorvos in environmental water samples has been developed using microwave-assisted-headspace-liquid-phase microextraction (MAE-HS-LPME) coupled with high performance liquid chromatography (HPLC). The influences of extraction parameters in the sample matrix were investigated. Under optimized experimental conditions, the detection limit (S/N=3), the quantification limit (S/N=10) and the enrichment factor of the proposed method for the target analyte were 0.96 μg/L, 3.20 μg/L and 54, respectively. The recoveries of target analyte spiked in real water samples were 87.4%~103%. The extraction performance of MAE-HS-LPME to the target analyte was also compared with liquid-liquid extraction (LLE). The results indicated that the developed method is simple, rapid, efficient, solvent-saving, highly selective and widely applicable.

Keywords： microwave-assisted extraction (MAE) headspace-liquid-phase microextraction (HS-LPME) high performance liquid chromatography (HPLC) dichlorvos environmental waters

Received 2010-08-20; published 2010-12-27

Fund:

中央高校基本科研业务费项目(No. CDJXS10220004)、重庆市科学委员会自然科学基金项目(No. CSTC2008BB9266)和重庆市教育委员会科学技术研究项目(No. KJ100102).

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孔娜1, 邹小兵1,2*, 黄锐2,3, 夏之宁1,2, 魏欣旸1.微波辅助-顶空液相微萃取在线联用-高效液相色谱法测定环境水样中的敌敌畏[J] 色谱, 2010,V28(12): 1200-1203

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