

液相色谱-质谱法同时测定塑料制品中的双酚A和四溴双酚A

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Simultaneous determination of bisphenol A and tetrabromo- bisphenol A in plastic products using high performance liquid chromatography-mass spectrometry

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摘要 建立了高效液相色谱-质谱同时测定塑料制品中的双酚A(BPA)和四溴双酚A(TBBP-A)的方法。采用超声波萃取技术萃取样品。系统地考察了前处理条件、色谱条件和质谱参数。实验表明,在50 ℃条件下,加入20 mL二氯甲烷对塑料样品中的BPA和TBBP-A超声提取60 min可获得较好的提取效果。以甲醇和水为流动相,采用液相色谱-质谱联用分离和检测BPA和TBBP-A。该方法的线性范围为0.1~2.0 mg/L; BPA和TBBP-A检出限分别为0.01 mg/kg和0.02 mg/kg;回收率为85.4%~97.6%。该方法分离时间短,操作简便,实用性强,灵敏度高,适用于塑料制品中双酚A和四溴双酚A的残留分析。

关键词: 超声波萃取 高效液相色谱-质谱 双酚A 四溴双酚A 塑料制品

Abstract: A method for the determination of bisphenol A (BPA) and tetrabromobisphenol A (TBBP-A) in plastic products using high performance liquid chromatography-mass spectrometry (HPLC-MS) was developed with the ultrasonic extraction. The conditions of sample pretreatment, chromatography and mass-spectrometry parameters were studied systematically. The research showed that the extraction of the BPA and TBBP-A can reach a good performance with 20 mL dichloromethane at 50 ℃ under ultrasonic extraction for 60 min. The BPA and TBBP-A were separated and detected using HPLC-MS with the mobile phase of methanol and water. The linearity range of the method was 0.1~2.0 mg/L. The detection limits were 0.01 mg/kg for BPA and 0.02 mg/kg for TBBP-A. The recoveries for the spiked samples were 85.4%~97.6%. This method is time-saving, easy-handling, practicable and sensitive, and it can be applied to determine the residues of BPA and TBBP-A in plastic products.

Keywords: ultrasonic extraction high performance liquid chromatography-mass spectrometry (HPLC-MS) bisphenol A tetrabromobisphenol A plastic products

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