

多壁碳纳米管固相萃取-高效液相色谱-串联质谱法测定食品接触材料中双酚-二环氧甘油醚的迁移量

吴新华², 丁利¹, 李忠海², 张彦丽², 刘晓霞¹, 王利兵^{1*}

1. 湖南省检验检疫科学技术研究院, 湖南出入境检验检疫局技术中心, 食品安全科学技术湖南省重点实验室, 湖南 长沙 410004; 2. 中南林业科技大学食品科学与工程学院, 湖南 长沙 410004

Determination of the migration of bisphenol diglycidyl ethers from food contact materials by high performance chromatography-tandem mass spectrometry coupled with multi-walled carbon nanotubes solid phase extraction

WU Xinhua², DING Li¹, LI Zhonghai², ZHANG Yanli², LIU Xiaoxia¹, WANG Libing^{1*}

1. Hunan Academy of Inspection and Quarantine, Technology Center of Hunan Entry-Exit Inspection and Quarantine Bureau, Hunan Key Laboratory of Food Safety Science & Technology, Changsha 410004, China; 2. Faculty of Food Science and Engineering, Central South University of Forestry and Technology, Changsha 410004, China

摘要	参考文献	相关文章
----	------	------

Download: PDF (230KB) [HTML](#) 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 建立了测定食品接触材料中6种双酚-二环氧甘油醚(双酚A二缩水甘油醚(BADGE)及其衍生物双酚A(2,3-二羟丙基)甘油醚(BADGE•H₂O)、双酚A(3-氯-2-羟丙基)甘油醚(BADGE•HCl)、双酚A(3-氯-2-羟丙基)(2,3-二羟丙基)醚(BADGE•H₂O•HCl)和双酚F二缩水甘油醚(BFDGE)及其衍生物双酚F双(3-氯-2-羟丙基)甘油醚(BFDGE•2HCl))迁移到食品中的迁移量的高效液相色谱-串联质谱法(HPLC-MS/MS)。样品以叔丁基甲醚(MTBE)为提取溶剂,超声提取,提取液经多壁碳纳米管(MWCNTs)固相萃取(SPE)柱富集、净化。以COSMOSIL C18为分析柱,流动相为0.1%甲酸的5 mmol/L醋酸铵溶液和甲醇。6种双酚-二环氧甘油醚在1.0~100 µg/L范围内线性关系良好($r^2 > 0.9991$)。在3个添加水平下,6种目标化合物的回收率范围为78.6%~89.9%,相对标准偏差小于10%。方法检出限范围为0.5~1.5 µg/L。该方法操作简单,灵敏度高,可应用于食品接触材料中双酚-二环氧甘油醚迁移量的快速检测。

关键词: 高效液相色谱-串联质谱 多壁碳纳米管 固相萃取 双酚-二环氧甘油醚 迁移量 食品接触材料

Abstract: A comprehensive analytical method based on high performance liquid chromatography-tandem mass spectrometry (HPLC-MS/MS) was developed for measuring 6 exogenous endocrine disruptors—bisphenol diglycidyl ethers, including bisphenol A diglycidyl ether (BADGE), bisphenol A glycidyl (2,3-dihydroxypropyl) ether (BADGE•H₂O), bisphenol A glycidyl (3-chloro-2-hydroxypropyl) ether (BADGE•HCl), bisphenol A (3-chloro-2-hydroxypropyl) (2,3-dihydroxypropyl) ether (BADGE•H₂O•HCl), bisphenol F diglycidyl ether (BFDGE) and bisphenol F bis (3-chloro-2-hydroxypropyl) ether (BFDGE•2HCl). The samples were extracted with methyl tert-butyl ether (MTBE) by ultrasonic wave assistant extraction. The extracts were cleaned up and concentrated on multi-walled carbon nanotubes (MWCNTs). The target compounds were analyzed by HPLC-MS/MS under positive ion mode using a COSMOSIL C18 column as analytical column. Under the optimal conditions, the calibration curves showed a good linearity in the concentration range of 1.0~100.0 µg/L for 6 target compounds. The correlation coefficients (r^2) were higher than 0.9991. Recoveries of 6 analytes at three spiked levels ranged from 78.6% to 89.9%, with relative standard deviations (RSDs) less than 10%. The detection limits of the method ranged from 0.5 to 1.5 µg/L. The method is sensitive and simple, and is suitable for the rapid determination of the migration of bisphenol diglycidyl ethers from food contact materials.

Keywords: high performance liquid chromatography-tandem mass spectrometry (HPLC-MS/MS) multi-walled carbon nanotubes solid-phase extraction (SPE) bisphenol diglycidyl ethers migration food contact materials

Received 2010-07-22; published 2010-11-25

Fund:

国家公益性基金项目(No. 2009424011).

Corresponding Authors: 王利兵,博士,研究员,研究方向为食品安全与检验检疫安全. Email: wang_lb@eyou.com

引用本文:

吴新华², 丁利¹, 李忠海², 张彦丽², 刘晓霞¹, 王利兵^{1*}. 多壁碳纳米管固相萃取-高效液相色谱-串联质谱法测定食品接触材料中双酚-二环氧甘油醚的迁移量[J] 色谱, 2010, V28(11): 1094-1098

WU Xinhua², DING Li¹, LI Zhonghai², ZHANG Yanli², LIU Xiaoxia¹, WANG Libing^{1*}. Determination of the migration of bisphenol diglycidyl ethers from food contact materials by high performance chromatography-tandem mass spectrometry coupled with multi-walled carbon nanotubes solid phase extraction[J] Chinese Journal of Chromatography, 2010, V28(11): 1094-1098

链接本文:

http://www.chrom-china.com/CN/10.3724/SP.J.1123.2010.01094 或 http://www.chrom-china.com/CN/Y2010/V28/I11/1094

Service
▶ 把本文推荐给朋友
▶ 加入我的书架
▶ 加入引用管理器
▶ Email Alert
▶ RSS
作者相关文章
▶ 吴新华
▶ 王利兵
▶ 李忠海
▶ 丁利
▶ 刘晓霞
▶ 张彦丽