

## 大流量采样高分辨气相色谱/高分辨质谱法测定大气中的多氯联苯和多溴联苯醚

李晓敏, 王璞, 李英明, 王亚韡, 张庆华\*, 江桂斌

环境化学与生态毒理学国家重点实验室, 中国科学院生态环境研究中心, 北京 100085

### Determination of polychlorinated biphenyls and polybrominated diphenyl ethers in ambient air using high volume sampling and high resolution gas chromatography coupled with high resolution mass spectrometry

LI Xiaomin, WANG Pu, LI Yingming, WANG Yawei, ZHANG Qinghua\*, JIANG Guibin

State Key Laboratory of Environmental Chemistry and Ecotoxicology, Research Center for Eco-Environmental Science, Chinese Academy of Sciences, Beijing 100085, China

摘要

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**摘要** 建立了大流量空气采样高分辨气相色谱/高分辨质谱(HRGC/HRMS)同时分析测定大气样品中多氯联苯(PCBs)和多溴联苯醚(PBDEs)的方法。结果表明在采样过程中污染物没有发生穿透。通过添加  $^{13}\text{C}$  同位素标准物质进行评价, PCBs和PBDEs的加标回收率分别为121.4%和69.9%~140.4%,均符合美国环保署相关方法的要求。PCBs和PBDEs的方法检出限分别低于0.019 pg/m<sup>3</sup>和0.189 pg/m<sup>3</sup>,谱分离效果良好,可以满足大气样品中PCBs和PBDEs的监测需要。

**关键词:** 高分辨气相色谱/高分辨质谱 多氯联苯 多溴联苯醚 大气

**Abstract:** A method for the determination of polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs) in ambient air using high volume sampling and high resolution gas chromatography coupled with high resolution mass spectrometry (HRGC/HRMS) was developed. The results indicated that no breakthrough happened during the sampling procedure. The recoveries of  $^{13}\text{C}$  labeled compound standards of PCBs and PBDEs were in the range of 60.7%~121.4% and 69.9%~140.4%, respectively, which were qualified by the corresponding EPA methods. The detection limits (LODs) of PCBs and PBDEs in real samples were lower than 0.019 pg/m<sup>3</sup> and 0.189 pg/m<sup>3</sup>, respectively. The chromatograms of PCBs and PBDEs show good performance in the separation. It is demonstrated that the method is suitable for the determination of PCBs and PBDEs in ambient air.

**Keywords:** high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS) polychlorinated biphenyls (PCBs) polybrominated diphenyl ethers (PBDEs) ambient air

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Corresponding Authors: 张庆华

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