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珠江三角洲沉积物钻孔中多溴联苯醚的垂直变化规律研究

Vertical distributions of polybrominated diphenyl ethers of sediment core in the Pearl River Delta

关键词: [多溴联苯醚](#) [钻孔](#) [垂直分布](#) [珠江三角洲](#) [降解](#)

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作者 单位

路风辉 1. 顺德职业技术学院, 顺德 528300

陈满英 2. 广东产品质量监督检验研究院, 顺德 528300

陈纪文 2. 广东产品质量监督检验研究院, 顺德 528300

罗孝俊 3. 中国科学院广州地球化学研究所有机地球化学国家重点实验室, 广州 510640

麦碧娴 3. 中国科学院广州地球化学研究所有机地球化学国家重点实验室, 广州 510640

摘要: 采用GC/MS分析方法测定了珠江三角洲水体5个钻孔(分别采自东江东莞段、珠江广州段、北江中段、西江入海口和顺德段)80个样品中10种多溴联苯醚(PBDEs, BDE209和 Σ_9 BDEs)的含量, 对其沉积规律进行研究和探讨。 Σ_9 BDEs含量范围为 $1.54\sim 94.8 \text{ ng} \cdot \text{g}^{-1}$, 平均值为 $15.4 \text{ ng} \cdot \text{g}^{-1}$ 。BDE209含量范围为 $14.4\sim 588 \text{ ng} \cdot \text{g}^{-1}$, 平均值为 $136 \text{ ng} \cdot \text{g}^{-1}$, 占总PBDEs含量的70%以上。钻孔中PBDEs含量从底部到表层呈现上升趋势, 表明近年来珠江三角洲PBDEs环境排放仍在增加。5个钻孔中低溴代 Σ_9 BDEs从表层至底部逐渐增加, 而高溴代 Σ_9 BDEs逐渐减少, 意味着钻孔中可能存在脱溴降解行为。

Abstract: To investigate the temporal distribution of polybrominated diphenyl ethers (PBDEs) in the Pearl River Delta, five sediment cores from Pearl River were collected and 10 PBDE congeners were measured using GC/MS. Σ_9 BDEs (sum of PBDE congeners excluded BDE209) concentrations in the sediment cores were in the range of $1.54\sim 94.8 \text{ ng} \cdot \text{g}^{-1}$ with the average of $15.4 \text{ ng} \cdot \text{g}^{-1}$. Concentrations of BDE209 were between $14.4 \text{ ng} \cdot \text{g}^{-1}$ and $588 \text{ ng} \cdot \text{g}^{-1}$ with the average of $136 \text{ ng} \cdot \text{g}^{-1}$. BDE209 was the predominant congener accounting for more than 70% of total PBDEs. Increasing trends for PBDE concentration along with the decrease of sediment core depth were observed for all sediment cores, especially in Dongguan reach, indicating an increased emission of PBDEs in study area in recent years. The relative abundance of high brominated PBDEs decreased whereas abundance of low brominated PBDEs increased from top to bottom of sediment cores, which implied a debromination degradation of PBDEs in sediment cores.

Key words: [polybrominated diphenyl ethers \(PBDEs\)](#) [sediment cores](#) [vertical distribution](#) [Pearl River Delta](#) [debromination degradation](#)

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单位地址: 北京市海淀区双清路18号 邮编: 100085

服务热线: 010-62941073 传真: 010-62941073 Email: hjkxxb@rcees.ac.cn

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