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江汉平原四湖流域上区地下水中多环芳烃分布特征与源解析

### Distribution and source of polycyclic aromatic hydrocarbons in groundwater in the upper region of Sihue Lake Basin from Jiangnan Plain

关键词: [四湖流域](#) [多环芳烃](#) [地下水](#) [分布](#) [来源](#)

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作者 单位

蔡香宜 武汉科技大学资源与环境工程学院, 武汉 430081

何炎志 武汉科技大学资源与环境工程学院, 武汉 430081

孙云雷 武汉科技大学资源与环境工程学院, 武汉 430081

**摘要:** 初次对江汉平原四湖流域上区地下水中多环芳烃(PAHs)的分布特征和来源进行研究,选择湖北潜江长湖-汉江一带9个典型地下水采样点分枯水期和丰水期进行采样,并利用气相色谱与质谱联用仪对16种优先PAHs进行定量分析.结果表明,研究区枯水期和丰水期地下水中PAHs的浓度变化范围分别为62.74~224.63 ng·L<sup>-1</sup>和55.86~115.15 ng·L<sup>-1</sup>,总体水平表现出枯水期高于丰水期,且分布于滨湖区域和近岸带的地下水中PAHs浓度较高.这些PAHs输入途径比较复杂,经用主成分分析法分析其来源,大致可归结为燃烧源,部分采样点有石油或石油燃烧的污染.研究区域地下水中PAHs浓度与国内某些地区相比,显示出较低的污染水平,但就致癌性PAHs来看,枯水期具有致癌性PAHs的浓度范围在19.32~153.39 ng·L<sup>-1</sup>之间,丰水期在16.30~64.22 ng·L<sup>-1</sup>之间,均已远远超出地下水中PAHs所允许的致癌浓度范围,这必然会对当地人类身体健康构成威胁.

**Abstract:** The distribution characteristics and sources of polycyclic aromatic hydrocarbons (PAHs) in groundwater of the upper region of Sihue Lake Basin, Jiangnan Plain were investigated. Nine sampling sites were selected from Long Lake to Han River in Qianjiang city, Hubei province. Eighteen groundwater samples were collected both in the dry and wet seasons and sixteen priority PAHs were determined by gas chromatograph coupled with mass spectrum (GC-MS). The results showed that the concentration of PAHs ranged from 62.74 to 224.63 ng·L<sup>-1</sup> and from 55.86 to 115.15 ng·L<sup>-1</sup> in the dry and wet seasons, respectively. In general, the content of PAHs in the dry season was higher than that in the wet season. In addition, PAHs concentrations were higher in groundwater near the Lake area and inshore. Principal component analysis indicated that the main source of PAHs was combustion including oil pollution or oil burning. Compared with other areas in China, the concentrations of PAHs in groundwater in the study area were at lower levels. However, the ranges of carcinogenic PAHs were 19.32~153.39 ng·L<sup>-1</sup> in dry season and 16.30~64.22 ng·L<sup>-1</sup> in wet season, which were far beyond the carcinogenic concentration in groundwater. Therefore, PAHs in the groundwater pose a potential threat on the local human health.

**Key words:** [Sihue Lake Basin](#) [polycyclic aromatic hydrocarbons](#) [groundwater](#) [distribution](#) [source](#)

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服务热线：010-62941073 传真：010-62941073 Email: [hjkxxb@rcees.ac.cn](mailto:hjkxxb@rcees.ac.cn)

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