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滇池与红枫湖沉积物中磷的地球化学特征比较研究

Comparative study on the geochemical characteristics of phosphorus in sediments from Lake Dianchi and Hongfeng

关键词: [湖泊沉积物](#) [磷形态](#) [生物有效性](#) [富营养化](#)

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摘要: 对比研究了滇池与红枫湖表层沉积物中磷的形态含量及其生物有效性。结果表明, 两湖沉积物总磷含量相当, 分别为 $1373.8\sim 4616.3\text{ mg}\cdot\text{kg}^{-1}$ 、 $1194.4\sim 4324.3\text{ mg}\cdot\text{kg}^{-1}$ 。HCl-P、Res-P为滇池沉积物中主要的磷形态, 占总磷的62.9%~86.4%; 而红枫湖中磷形态顺序为NaOH-P>Res-P>HCl-P>BD-P>NH₄Cl-P; 两湖沉积物中有机磷均以低活性态为主。红枫湖沉积物中NH₄Cl-P、BD-P、NaOH-rP及生物有效磷等平均含量明显高于滇池, 表明其内源磷释放对上覆水体富营养化的贡献更大。Olsen-P与NH₄Cl-P、BD-P、NaOH-rP等活性磷形态呈显著正相关, 而与NaOH-nrP、HCl-P、Res-P、TP等相关性不显著, 因此, 可作为评价两湖沉积物释磷能力及其潜在环境风险的重要指标。

Abstract. Phosphorus (P) forms, contents and its bioavailability in typical surface sediments from Lake Dianchi and Hongfeng was investigated and compared. Results showed that TP contents in sediments from Lake Dianchi were similar to those from Lake Hongfeng, ranging from 1373.8 to $4616.3\text{ mg}\cdot\text{kg}^{-1}$ and 1194.4 to $4324.3\text{ mg}\cdot\text{kg}^{-1}$, respectively. HCl-P and Res-P were the two main P fractions in Lake Dianchi with the relative contribution of 62.9%~86.4% to TP. Oppositely, P fractions in Lake Hongfeng varied in the rank order of NaOH-P>Res-P>HCl-P>BD-P>NH₄Cl-P. Lowly-labile organic P fractions were dominant in those lake sediments. The average contents of NH₄Cl-P, BD-P, NaOH-rP and bioavailable P in the sediment of Lake Hongfeng were significantly higher than Lake Dianchi, which suggested that internal P loading was more hazardous in Lake Hongfeng on promoting lake eutrophication than in Lake Dianchi. Olsen-P was significantly positively related to the contents of NaOH-rP, BD-P, NH₄Cl-P, but it was not significantly correlated with NaOH-nrP, HCl-P, Res-P and TP, indicating the appropriate index for estimating P bioavailability in sediments and its potential release risk into those two lakes.

Key words. [lake sediments](#) [phosphorus forms](#) [bioavailability](#) [eutrophication](#)

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