

# 环境科学

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## 温度对钝化剂抑制滇池底泥磷释放的影响

摘要点击 151 全文点击 94 投稿时间: 2007-9-11 最后修改时间: 2007-12-1

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英文关键词 [inactivation agent](#) [temperature](#) [sediment](#) [phosphorus release](#)

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### 中文摘要

采用硫酸铝和聚铝2种钝化剂研究温度对滇池重污染底泥磷释放的影响。结果表明, 温度每升高10℃, 底泥TP释放增量为1.22%~38.69%, DTP释放增量为4.79%~76.82%, 在25~35℃, 底泥内源磷释放量增量最大。随着温度的升高底泥内源磷释放量增加的原因在于: 一方面随着环境温度的升高, 间隙水耗氧量增多, 加速了 $Fe^{3+} \rightarrow Fe^{2+}$ 转化, 促使沉积物中铁结合态磷释放; 另一方面微生物活动可使沉积物中有机态磷转化成无机态磷酸盐而得以释放。投加钝化剂对沉积物的内源磷释放的抑制和上覆水中含磷颗粒的捕捉有显著效果, 在25℃以下时, 聚铝的抑制效果优于硫酸铝, 在5、15和25℃对沉积物内源磷的抑制率聚铝比硫酸铝分别高出0.49%、1.32%和1.03%; 随着温度升高到35℃, 聚铝控磷的稳定性降低, 抑制效果减弱, 硫酸铝的控制效果反而较聚铝高2.25%。聚铝组底泥的温度平均比硫酸铝组底泥的温度低2~3℃。

### 英文摘要

The influence of temperature on P release from sediment of Lake Dianchi was discussed. Two kinds of inactivation agent schemes ( $Al_2SO_4 \cdot 18H_2O$  and PAC-Polymeric Aluminum Chloride) were used. The results show that the P release amount from sediment increased as the environmental temperature increased. As temperature raised 10 °C, the TP release amount increased 1.22%~38.69%, the DTP release amount increased 4.79%~76.82%. From 25°C to 35 °C, the sediment had the largest P release increment. When temperature rose, the oxygen demand in the overlying water increased. Then the transformation speed of  $Fe^{3+}$  to  $Fe^{2+}$  increased, and then the release of Fe-P in sediment accelerated. On the other hand, microbe activity made the release possible through the transformation from organic-phosphorus to inorganic-phosphorus. The inactivation agents used here have significant effect on restraining the phosphorus release from sediment and the capture of particles containing phosphorus in overlying water. PAC had better P inactivation effect than  $Al_2SO_4$  at 25°C. Inhibition rate of P release from sediment by PAC was about 0.49%, 1.32%, 1.03% higher than  $Al_2SO_4$  at 5, 15 and 25°C, respectively. As the temperature rose to 35°C, the capacity that PAC restricted P was weakened, so the effect of P release inhibition was weakened. Inactivation rate of  $Al_2SO_4$  was higher about 2.25% than PAC to P from sediment at 35°C. Temperature of sediments in PAC sets is 2~3°C lower than that of  $Al_2SO_4$  sets.

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