

[快速检索](#)[检索](#) [高级检索](#)[首页](#)[稿约信息](#)[编者论坛](#)[编委会](#)[关于本刊](#)[订购本刊](#)[下载中心](#)

方振东,仙光,龙向宇,唐然,李洪波,卢升.胞外聚合物磷酸盐形态对生物除磷过程的影响研究[J].环境科学学报,2014,34(9):2205-2212

胞外聚合物磷酸盐形态对生物除磷过程的影响研究

Effect of phosphate species in extracellular polymer substances on biological phosphorus removal process

关键词: [胞外聚合物](#) [磷酸盐形态](#) [生物除磷](#) [污泥龄](#) [溶解氧](#)基金项目: [中国博士后科学基金\(No.20110491845\)](#); [重庆市自然科学基金\(No.CSTC2009BB7175\)](#)

作者 单位

方振东 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311

仙光 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311

龙向宇 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311; 2. 后勤工程学院化学工程与技术博士后流动站, 重庆 401311

唐然 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311

李洪波 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311

卢升 1. 后勤工程学院国防建筑规划与环境工程系, 重庆 401311

摘要: 以不同DO条件下污泥龄(SRT)分别为10 d和30 d的两组实验室A/O-SBR反应器活性污泥为研究对象,探讨了胞外聚合物(EPS)磷酸盐形态对生物除磷过程的影响。结果表明,污泥絮体中的磷主要分布于EPS中,PO₄³⁻-P和聚磷酸盐(Poly-P,包括低分子量聚磷酸盐LMW Poly-P和高分子量聚磷酸盐HMW Poly-P)是EPS磷的主要形态;EPS对生物除磷的影响明显大于细菌细胞,EPS磷的厌氧降低量和好氧升高量为胞内磷变化量的2.8~6.4倍。EPS中的LMW Poly-P和HMW Poly-P含量均表现厌氧降低和好氧升高的变化规律;对于相同SRT的污泥,中DO(2.5~3.5 mg·L⁻¹)条件较之低DO(0.7~1.0 mg·L⁻¹)条件下EPS的LMW Poly-P和HMW Poly-P有更大的厌氧降低量和好氧升高量,对应着更明显的生物除磷过程,说明EPS不仅是生物除磷过程的中转站,而且参与了生物聚磷过程。

Abstract: By adopting the activated sludge from two laboratory scale A/O-SBR reactors, the effect of phosphate species in extracellular polymer substances (EPS) on biological phosphorus removal process was investigated. The SRT was 10d and 30d, respectively, in the two reactors under different DO conditions. The results showed that phosphorus of sludge floc was mainly contained in EPS, orthophosphate (PO₄³⁻-P) and polyphosphate (Poly-P) with low and high molecular weight (LMW Poly-P and HMW Poly-P) were the main species of phosphorus in EPS. Furthermore, EPS played a more important role in biological dephosphorization than bacteria. Decrease of EPS phosphorus in anaerobic phase and increase in aerobic phase were 2.8~6.4 times those of the intracellular phosphorus. Same variation was shown that the contents of LMW Poly-P and HMW Poly-P in EPS decreased in anaerobic phase but increased in aerobic phase. For the same SRT sludge, decrease of EPS phosphorus in anaerobic phase and increase in aerobic phase at moderate DO concentration (2.5~3.5 mg·L⁻¹) were greater than those at limited DO concentration (0.7~1.0 mg·L⁻¹), so the former had higher efficiency of biological phosphorus removal than the latter. Therefore, EPS not only acted as a transfer station of dephosphorization process, but also participated in biological accumulation of phosphorus.

Key words: [extracellular polymer substances](#) [phosphate species](#) [biological phosphorus removal](#) [solid retention time](#) [dissolved oxygen](#)

摘要点击次数: 1067 全文下载次数: 2061

[关闭](#)[下载PDF阅读器](#)

您是第27650850位访问者

主办单位: 中国科学院生态环境研究中心

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: hjkkxb@rcees.ac.cn

本系统由北京勤云科技发展有限公司设计