

Removal of phosphorus in municipal landfill leachate by photochemical oxidation combined with ferrate pre-treatment

Zong-Ping Wang*, Li-zhi Huang, Xiao-Nan Feng, Peng-Chao Xie, Zi-zheng Liu

*School of Environmental Science and Engineering, Huazhong University of Science and Technology, Wuhan, 430074, China
Tel. +86 (27) 8755-9163; email: zongpingw@yahoo.com.cn*

Received 12 November 2009; Accepted 28 March 2010

ABSTRACT

Removal of phosphorus in municipal landfill leachate by photochemical oxidation processes combined with ferrate pre-treatment was investigated in this study. Removal effect of phosphorus in the five systems, Fe(VI)/UV, Fe(VI)/TiO₂/UV, Fe(III)/UV, TiO₂/UV and UV, were evaluated. The results show that ferrate pre-treatment removes 78% of total phosphorus by using 0.16 mM ferrate dealing with 500 mL municipal landfill leachate at pH 5. Among the five systems, Fe(VI)/TiO₂/UV is the most efficient process for total phosphorus removal (almost 100%).

Keywords: Landfill leachate; Phosphorus; Ferrate; Photochemical oxidation

* Corresponding author.