

垃圾渗滤液处理工艺运行参数优化与技术比较

Parameter optimization and technology comparison for landfill leachate treatment

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中文摘要:

垃圾渗滤液是公认的一种成分复杂且难以处理的高浓度有机废水,笔者在北京市海淀区六里屯垃圾填埋场通过2007—2010年垃圾渗滤液处理的工程实践,以COD和氨氮的去除率为指标,研究了不同的垃圾渗滤液处理工艺组合,以及不同运行参数条件下对垃圾渗滤液的处理效果。结果表明,在中温UASB和A/O的平均水力停留时间(HRT)缩短1/3的情况下,通过改进A/O段曝气方式,优化系统的pH、DO等运行参数,用MBR替代絮凝工艺,使整个组合工艺对COD的年平均去除率达到了94.3%,氨氮的去除率维持在99.5%以上,出水氨氮稳定在10 mg/L以内,而改造前的COD与氨氮的年平均去除率仅为82.2%与55.3%。与改造前的UASB+A/O+絮凝工艺组合相比,改造后的UASB+A/O+MBR工艺组合具有更高的污染物去除能力、更好的抗缓冲性和稳定性。

英文摘要:

Landfill leachate is a high-strength wastewater that may contain high concentrations of organic and inorganic matter. In this study, the operating parameters and removal efficiency for COD and ammonia nitrogen (NH_4^+-N) were compared for two different treatment chains and operating parameters at the Liulitun landfill leachate system during 2007 and 2010. In 2007, before improvement, the removal of COD and NH_4^+-N in the treatment chain of a mesophilic UASB+A/O+flocculation were 62%-97% and 18%-74%, respectively. The process was changed by reducing the hydraulic retention time by 1/3, adjustment of A/O aeration method, optimization of operating parameters such as pH and DO, and by replacing the flocculant used by MBR. Over a period of 1 year, these changes resulted in a COD removal of 81%-99%, and NH_4^+-N removal of 99.5%. The effluent content of NH_4^+-N was less than 10 mg/L. These results indicate that optimization of UASB+A/O+MBR processes can have a profound effect on system performance allowing shorter treatment periods and easy management while substantially reducing COD and NH_4^+-N .

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