

Anarwia工艺处理猪场废水节能效果的研究

Efficiency of energy-saving of anaerobic-adding raw wastewater-intermittent aeration(Anarwia) process for treatment of piggery wastewater

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中文摘要:

分析比较了厌氧-加原水-间隙曝气(Anarwia)工艺、SBR(序批式反应器)以及厌氧-SBR工艺处理猪场废水的效果。比较三种工艺处理效果表明:厌氧-SBR工艺处理猪场废水,污染物去除效率低,出水污染物浓度高,不适于猪场废水的处理。Anarwia工艺处理效果与SBR工艺相当,污染物去除率高,出水COD和NH₃-N浓度低。在此基础上,以一个日处理1200 t猪场废水处理工程为例,分析比较了Anarwia与SBR工艺的能耗。就能量消耗有关的工艺参数——污泥量和需氧量而言,Anarwia工艺分别比SBR工艺减少16.4%和95.9%,此外Anarwia工艺每天可产生2784 m³沼气。Anarwia工艺增加了废水提升能耗,但减少了曝气、污泥处理、滗水和搅拌的能耗,结果Anarwia工艺总电耗比SBR工艺低81.0%。Anarwia工艺产生的沼气用于发电能完全补偿消耗的能量,并有剩余。

英文摘要:

The treatment effects of the anaerobic-adding raw wastewater-intermittent aeration(Anarwia), Sequencing Batch Reactor(SBR) and anaerobic-SBR process were compared. Among the three processes, anaerobic-SBR process was not technologically feasible to the treatment of piggery wastewater because of poor removal efficiency of chemical oxygen demand, ammonia nitrogen from wastewater and higher concentration of pollutant remained in the effluent. The treatment efficiency of Anarwia process could reach that of the SBR process with more efficient removal of chemical oxygen demand and ammonia nitrogen and relatively lower concentration of them in the effluent. Taking a plant treating 1200 t/d piggery wastewater as an example, the energy consumption of Anarwia process and SBR process was compared. As for the sludge yield and the oxygen demand that are process parameters interrelated energy consumption, the sludge yield and chemical oxygen demand by Anarwia process are 16.4% and 95.9% lower than those by SBR process. In addition, Anarwia process can produce 2784 m³/d biogas. Anarwia process increased energy consumption of pumping wastewater, and decreased that of aeration, sludge treatment, decanting and stirring, resulting in that the total energy consumption of Anarwia process was 81.0% lower than that of SBR process. Moreover, the energy consumed in Anarwia process could be completely compensated by electricity generated from biogas.

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