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UASB反应器处理造纸废水不同高度的污泥特性

Sludge characteristics along the height of full-scale UASB reactor treating paper-mill effluents

关键词：污泥特性 产甲烷活性 生产性UASB反应器 造纸废水

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摘要：为探讨上向流污泥床(UASB)反应器不同高度处的污泥特性,研究了生产性UASB反应器(总高7.2 m)处理造纸废水时不同高度的污泥外观形态、稳定性及其产甲烷活性.结果显示,VS、TS、VSS、TSS浓度随着在反应器中取样高度的增加逐渐降低,并在距离反应器底部2.20 m高度处出现分层.反应器1.20 m和3.45 m高度处的溶解性COD值较大(900 mg·L^{-1}以上).反应器1.20 m处污泥的稳定性较好(VS/TS较低),固体浓度较高(TS 136 g·L^{-1},VS 75 g·L^{-1}),产甲烷活性较高(0.16 g·g^{-1}·d^{-1},以每g VSS中的COD计),颗粒较大(平均当量直径为308 μm).UASB反应器处理造纸废水不同高度的污泥颗粒外观形态虽有差异,但污泥的生物活性近似.

Abstract: The observations of sludge stability, granule morphology and specific methanogenic activity (SMA) were used to investigate the sludge characteristics along the height of full-scale upflow anaerobic sludge bed (UASB) reactor treating paper-mill effluents. The results showed that the solids concentration of sludge decreased and then stabilized with increasing heights along UASB reactor. Higher soluble COD concentration (more than 900 mg·L^{-1}) of sludge was obtained at 1.20 m and 3.45 m of the UASB reactor. In terms of the ratio of VS/TS, SMA and morphology characteristics of sludge, the sludge from 1.20 m of UASB reactor was more stable (VS/TS as 50%) and had higher SMA (0.16 g·g^{-1}·d^{-1}, as amount of COD in per gram VSS) and bigger granule (average equivalent diameter as 308μm) than that of other places of the reactor. The sludge along the height of full-Scale UASB reactor had significant difference in granule morphology, but had close specific methanogenic activity.

Key words: sludge characteristics specific methanogenic activity full-scale UASB reactor paper-mill wastewater