

造纸白泥和粉煤灰的添加对污泥消化液中氮磷回收的影响

Recovery of nitrogen and phosphorus from digested effluent of sludge by paper mill lime mud and fly ash addition

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中文摘要:

污泥厌氧消化液中含有丰富的氮磷,若直接排放到环境中,将会对附近水体造成严重污染。由于消化液中 Mg^{2+} 和 Ca^{2+} 的含量很低,严重影响了氮磷的回收效果。把造纸白泥和粉煤灰引入到污泥厌氧消化液氮磷的回收当中,可以明显地提升消化液pH和提高 PO_4^{3-} -P和 NH_3 -N回收率。实验结果表明:当造纸白泥添加量为4 g/(L·h)时,曝气12 h后,pH可达10.19,此时 PO_4^{3-} -P和 NH_3 -N回收率分别达到64%和45%;而当粉煤灰添加量为4 g/(L·h)时,曝气12 h后,pH达到9.63, PO_4^{3-} -P和 NH_3 -N回收率分别为46%和41%。但仅用曝气方式处理,12 h后,pH值仅为8.52, PO_4^{3-} -P和 NH_3 -N回收率分别只有20%和18%。实验结果还表明,水力停留时间(HRT)越大,pH上升速度越快,幅度越大,氮磷的回收效果就越好。

英文摘要:

The anaerobically digested effluent of sludge has plenty of nitrogen and phosphorus, when the digested effluent of sludge is discharged into the environment directly without treatment, the water body would be polluted seriously. There are not enough Mg^{2+} and Ca^{2+} contents to form MAP in the digested effluent of sludge, which inhibit the effects of nitrogen and phosphorus recovery seriously. The paper mill lime mud (PMLM) and fly ash (FA) were introduced into the recovery of nitrogen and phosphorus from digested effluent of sludge, which could raise the pH and increase the effects of nitrogen and phosphorus recovery of anaerobically digested effluent of sludge obviously. The experimental results showed that when the dosage of PMLM was 4 g/(L·h), and the aeration time was 12 h, the recovery rates of PO_4^{3-} -P and NH_3 -N were 64% and 45%, respectively, as well as the pH value was 10.19. Besides, when the dosage of FA was 4 g/(L·h), and the aeration time was 12 h, the recovery rates of PO_4^{3-} -P and NH_3 -N were 46% and 41%, respectively, and the pH was 9.63. However, without PMLM and FA addition, when the aeration time was 12 h, the recovery rates of PO_4^{3-} -P and NH_3 -N were only 20% and 19%, respectively. Therefore, it was important to recover the nitrogen and phosphorus from anaerobically digested effluent of sludge with PMLM and FA addition. The results also showed that the lifting speed of pH accelerated when HRT increased, and the bigger the HRT

was, the larger the lifting range was.

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