عنوان مقاله:

The Effect of Mixing Rate on Performance of Anaerobic Reactor in Methane Production

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خلاصه مقاله:

In this study, a mathematical model was used to predict the dynamic behaviour of the system under conditions of imperfect mixing in an Anaerobic Digestion (AD) process. To evaluate the system performance, the effect of mixing parameters by calculating the quantities of methane gas produced, system power, and effluent quality was investigated. Numerical results showed that with an increase in the mixing rate (α) by ۲۰%, methane production rate, power production, and the effluent COD removal efficiency of the system increased by ۱۹%, ۱۹% and ۱۲%, respectively. At an equal mixing rate, the amount of methane produced in influent with a concentration of ۱۲.۱% was ۴.۵ times higher than the influent with a concentration of ۲.۵%, while no significant change was observed in the effluent quality. Additionally, it was found that the mixing rate effect is more important than the mean cell retention time in the anaerobic reactor. The best fitted correlations for methane production rate and effluent COD removal efficiency using regression analogy at different organic loads of wastewater are presented.

کلمات کلیدی:

anaerobic digestion, mathematical model, Methane Production, Mixing rate, Wastewater Treatment

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