

عنوان مقاله:

Biological hydrogen production from synthetic wastewater by an anaerobic migrating blanket reactor: Artificial neural network (ANN) modeling

محل انتشار:

مجله مدیریت ومهندسی بهداشت محیط, دوره 6, شماره 4 (سال: 1398)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Background: This study aimed to evaluate an anaerobic migrating blanket reactor (AMBR) for biological hydrogen production, and also to investigate its capability to treat synthetic wastewater. Methods: A five-compartment AMBR (9 L effective volume) was made by Plexiglas and seeded with thermal pretreated anaerobic sludge at 100°C for 30 minutes. The AMBR was operated at mesophilic temperature ($37 \pm 1^\circ\text{C}$) with continuous fed of synthetic wastewater at five organic loading rates (OLRs) of 0.5 to 8 g COD/L.d. Results: It was revealed that as the OLR increased from 0.5 to 8 g COD/L.d, the hydrogen production and also volumetric hydrogen production rate (VHPR) improved. Increasing the OLR over this range, led to a decrease in the average hydrogen yield from 1.58 ± 0.34 to 0.97 ± 0.45 mol H₂/mol glucose. The concentration of both volatile fatty acids (VFAs) and solvents kept increasing with OLR. During the AMBR operation, the dominant soluble end products (SEPs) were acetic and butyric acids in all of the OLRs studied. Conclusion: Based on the results, the hydrogen yield was related to the acetate/butyrate fermentation. The artificial neural network (ANN) model was well-fitted to the experimental obtained data from the AMBR, and was able to simulate the chemical oxygen demand (COD) removal and hydrogen production.

کلمات کلیدی:

AMB reactor, Fatty acids, Fermentation, Hydrogen, Wastewater treatment

لینک ثابت مقاله در پایگاه سیویلیکا:

