عنوان مقاله:

Combination of ozonation with aerobic sequencing batch reactor for soft drink wastewater treatment: experiments and neural network modeling

محل انتشار:

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خلاصه مقاله:

In this study, ozone combination with a sequencing batch reactor was tested in laboratory scale for treating a soft drink wastewater characterized by high concentrations of chemical oxygen demand (COD). A bench scale aerobic sequencing batch reactor (SBR) is carried out by two stages. The system was operated under three different mixed liquid suspended solids (MLSS) concentrations (3000, 4500, 6000 mg/l). The results show that the integrated ozonation with biological process was able to achieve high removal efficiencies for chemical oxygen demand (COD), with residual concentrations much lower than the current discharge limits. Also, the process was characterized by a very low MLSS concentration. Hence, the ratio between ozone dose and the COD removal was 0.72, indicating that the removed COD was higher than the dosed ozone. Artificial neural networks (ANN) was also employed to model the COD data obtained. A network consisting of two layers of five neurons in the hidden layer was considered. Regression coefficient between experimental data and data predicted by neural networks and root mean square error (R2, RMSE) obtained 0.991, 80.36, respectively. Very low error in the network estimation confirmed validity of the obtained networks for further analysis and optimization.

کلمات کلیدی:

Soft drink Wastewater SBR Ozone Artificial neural network

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