

Effect of thiocyanate loading and internal recycling on the biological pre-denitrification process treating cokes wastewater

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The pre-denitrification process treating cokes wastewater faces with abrupt variation in influent thiocyanate concentration. Therefore, we investigated the effect of thiocyanate loading on the pre-denitrification process performance as well as how the internal recycling ratio affects nitrogen removal when there is a high concentration of thiocyanate inflow. Increased 800 mg/L thiocyanate loading did not affect the reactor performance such as degradation of the pollutants and nitrification. However, TN concentration of the final effluent was increased up to 2 times higher than the discharge level. To improve the TN removal, the internal recycling ratio was changed from 2 to 5 as a main operating variable. Experimental results showed that the increased internal recycling ratio of 5 produced about 40% increase in TN removal efficiency and TN concentration of the final effluent was decreased below the discharge level. This improvement was due to decrease in nitrogen as nitrate in the effluent. Finally, when higher loading of thiocyanate is detected a higher internal recycling ratio should be used in order to meet regulations.