

Pontawit Aeimsintorn 2015: Biological Nitrogen Removal under Aerobic Condition with Poly- β -hydroxybutyrate Accumulation. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Pongsak Noopan, Ph.D. 69 pages.

The objective of this study was to investigate the efficiency of simultaneous nitrification and denitrification (SND) in the sequencing batch reactors. The experimental work consisted of two types. Type one, dissolved oxygen concentration was controlled at 0.5 mg/L and type two, dissolved oxygen concentration was aerated until saturation. The acetate concentrations as a carbon source in both types of experiment were 300 and 500 mg/L.

In the first type, after the experimental simultaneous nitrification and denitrification (SND) was operated until 8 hr of the reaction, nitrogen removal efficiencies of acetate concentrations of 300 and 500 mg/L were 31.73% and 46.5%, respectively. In the second type, nitrogen removal efficiencies of acetate concentrations of 300 and 500 mg/L were 19.73% and 28.81%, respectively. At the experimental control (denitrification process), the nitrogen removal efficiency was 100%.

The degradation rate of Poly- β -hydroxybutyrate, (PHB) in the experimental work was a first-order reaction. In the first type, the degradation rate of PHB as acetate concentrations of 300 mg/L and 500 mg/L were 6.74 and 7.3 mgPHB/gVSS.hr, respectively. In the second type, the degradation rate of PHB were 3.87 and 5.61 mgPHB/gVSS.hr, respectively. The kinetic of ammonia removal was a zero-order reaction. At the dissolved oxygen concentration of 0.5 mg/L, acetate concentrations of 300 and 500 mg/L, the ammonia removal rates were 2.94 and 2.37 mgN/g VSS.hr. The saturation oxygen aeration, acetate concentrations of 300 and 500 mg/L, the ammonia removal rates were 4.44 and 3.27 mgN/g VSS.hr, respectively.

Student's signature

Thesis Advisor's signature