

Nitirat Sasuk 2012: Effect of pH on Nitrous Oxide Emission of Anaerobic Ammonium Oxidation (ANAMMOX) Process. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Sanya Sirivithayapakorn, Ph.D. 85 pages.

The well-known biological process for nitrogen treatment in wastewater, nitrification and denitrification processes. ANAMMOX process is an alternative process that transforms ammonia to nitrogen gas under anaerobic condition with nitrite as an electron receptor. The anammox bacteria is autotroph. This research experiment was conducted in the 3.5 L anaerobic sequencing batch reactor (ASBR) with 3 L working volume. The synthetic water with the ratio of ammonium:nitrite 1:1.37 and the anammox bacteria was mixed in the reactor until the stable condition was met. The results indicated that the removal efficiencies of ammonium and nitrite were 98.89% and 99.46%, respectively.

The effects of pH on kinetics at the different levels of pH including pH 6.8, 7.3, 7.8 and 8.3 were studied. The experiment showed that the specific nitrogen removal rate was 0.68, 0.70, 0.72 and 0.73 gN/gMLVSS-day at pH 6.8, 7.3, 7.8 and 8.3 respectively. The effect of pH on the amount of nitrous oxide at the different levels of pH showed that the percentage of nitrous oxide produced per the total concentration of nitrogen is equal to 0.77%, 0.67%, 0.64% and 0.52% at pH 6.8, 7.3, 7.8 and 8.3 respectively. The results indicated that nitrous oxide production was highest at pH 6.8.

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Thesis Advisor's signature