

Thanyarat Benjakun 2010: Development of CANON Technology for The Treatment of Nitrogen Synthetic Wastewater. Master of Science (Environmental Science and Technology), Major Field: Environmental Science and Technology, Division of Science. Thesis Advisor: Ms. Thitiya Pung, Ph.D. 109 pages.

The Completely Autotrophic Nitrogen removal Over Nitrite (CANON) is the simultaneous partial nitrification and anaerobic ammonium oxidation (Anammox) for a nitrogen removal. This process relies on a stable interaction between two bacterial populations: nitrosomonas-like aerobic bacteria and planctomycete-like anaerobic ammonium oxidizing bacteria. However, the effect of extended 2 periods of partial nitrification and Anammox was investigated at the laboratory scale in 2 different reactor types: Sequencing Batch Reactor (SBR) and Anaerobic Sequencing Batch Reactor (ASBR). The SBR system with a working volume of 16 liters was used as a partial nitrification process (oxygen-limited step), and MLSS of 3,000 mg/L. The reactor was stirred at 50 rpm and the hydraulic retention time (HRT) was 6 hours. The ASBR system as Anammox process (Anoxic step) was run with a working volume of 24 liters and MLVSS of 20,000 mg/L. The reactor was stirred at 50 rpm and HRT was 72 hours. After partial nitrification in SBR, ammonium was removed at 50-61 % and become to be nitrite. This nitrite was transferred into ASBR (partial nitrification/Anammox) and become to be nitrogen gas at 99 % of influent nitrite. The COD was also removed at 80 %

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Student's signature

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Thesis Advisor's signature