

Monthicha Kamnoedthong 2012: Effect of Volumetric Loading of Partial Nitrification Process for the Preparation of Vermicelli Wastewater to Remove Nitrogen by Anammox Process. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Mongkol Damrongsri, Dr.Ing. 98 pages.

The wastewater from vermicelli factory characterizes as the high composition of nitrogen nutrient. Especially, ammonia nitrogen ( $\text{NH}_3\text{-N}$ ). The conventional biological nitrogen removal process to treat nitrogen from wastewater is nitrification process by aeration and added organic carbon in denitrification process. Nowadays the development of partial nitrification process change ammonia to nitrite ( $\text{NO}_2^- \text{-N}$ ) under aerobic condition by ammonium oxidation which called this process as: Single Reactor System for High Ammonium Removal Over Nitrite (SHARON) and follow up by ANAerobic AMMONium OXidation (Anammox) process. This Anammox process is able to treat nitrogen in wastewater by changing nitrite to nitrogen gas under anaerobic condition.

In this study the effect of volumetric loading of partial nitrification process for the preparation of vermicelli wastewater to remove nitrogen by anammox process. Study the lab scale reactor of volume 8 L. The variable parameters to control the study were ammonia loading rate. The dissolved oxygen in order to control partial nitrification process was control at  $0.7 \pm 0.1$  mg/L. The result of the experiments found that, at ammonia loading rate of 0.05, 0.08, 0.10 and  $0.12 \text{ kg-N/m}^3\text{-day}$ , the ammonia removal efficiencies were 91, 67, 53 and 36 percent. Therefore, the ratios of nitrite produced to ammonia utilization were equal to 1:1.60, 1:0.93, 1:0.50 and 1:0.33 respectively.

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