

Pornpimon Yimhoy 2009: Attachment of ANAMMOX Bacteria onto Surface of Different Plastic Media in Semi Continuous System. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Assistant Professor Sanya Sirivithayapakorn, Ph.D. 69 pages.

This research involves with the formation of granule of ANAMMOX bacteria on the surfaces of different plastic media in Semi Continuous System (SCS). The formation was investigated by using a Scanning Electron Microscope (SEM). Also, the DLVO (Derjaguin, Landau, Verwey and Overbeek) theory was used to describe the attachment of ANAMMOX with the surfaces of the media. In addition, SCS 200 mL was used to study the nitrogen removal efficiency in the different media. There were five different experiments: control experiment without supporting medium (R1) and experiments with four different types of supporting media. The selected media for this research are Nylon string (R2), smooth-surface plastic bead (R3), rough-surface plastic bead (R4) and synthetic sponge (R5). The synthetic media for experiments contained 210 mgN/L of ammonium (NH_4^+) and 273 mgN/L of nitrite (NO_2^-).

The total nitrogen removal efficiencies from the experiment R1, R2, R3, R4 and R5 were 17.31 ± 11.21 %, 15.44 ± 12.49 %, 96.75 ± 6.06 %, 97.26 ± 6.88 % and 98.56 ± 3.79 % respectively. The lowest nitrogen removal efficiency was found in the set of string reactor (R2). The efficiencies of nitrogen removal in the other media were very similar. According to the DLVO theory, ANAMMOX could attach to the surfaces of all media. Also, the photos from a SEM confirmed that ANAMMOX can bind with all media.

Student's signature

Thesis Advisor's signature