Enhancement of aerobic wastewater treatment by the application of attached growth microorganisms and microbubble generator

Wiratni Budhijanto, author

Abstrak

This paper presents the efficiency improvement in aerobic wastewater treatment technology through the application of a microbubble generator (MBG) for aeration. Aeration using an MBG is accomplished through water circulation and does not need air compressors, making it more energy efficient than conventional aerators. The MBG aerobic system with the variations on liquid flow rate (Q1) and airflow rate (Qg) combination was tested using artificial wastewater with a typical composition of organic waste. Experimental data were evaluated by means of a simplified mathematical model to systematically compare different MBG schemes. The study confirmed that the soluble chemical oxygen demand (SCOD) removal efficiency was significantly affected by the Qg values. Lower Qg values were preferable because they tended to have higher soluble chemical oxygen demand (SCOD) removal efficiency. However, the microbubbles were less stable at lower Qg due to the high incidence of bubble collisions. The study concluded that for applications in an actual aerobic waste treatment pond, the positioning of the MBG in the pond had to be carefully designed to minimize the collision tendency.