

Microbubble treatment on improving quality of palm oil mill effluent

ABSTRACT

Palm oil is one of the main crops planted in Malaysia, contributing financially and boosting the Malaysian economy tremendously. As one of the main biomasses from the oil palm industry, palm oil mill effluent (POME) is the main liquid biomass produced from the mill. Because of its high volume generation in huge volume, various strategies have been conducted to treat POME before being released into the water bodies. Current technology of aerobic and anaerobic pond required a longer time period to treat POME and is prone to produce inconsistent quality standard as regulated by the Malaysia Department of Environment. Microbubble treatment offers air floatation method utilizing high density of micro-size bubbles. This study aimed to investigate the capability of microbubble treatment in treating POME at certain treatment time. Microbubble generator was set up with polycarbonate tank for POME treatment, flow meter and skimmer. Diluted POME (20 and 30x) was treated with flow rate of 20.3 L/min for 5 hours. Samples were manually drawn for biochemical analysis. It was found that more than 60% of chemical oxygen demand (COD) removal was observed for both 20x and 30x dilution of POME. The highest oil and grease and total suspended solids (TSS) removal were observed after 5 hours of treatment time using 30x dilutions of POME with values of 87.92% and 78.47%, respectively. A consistent trend of high removal of COD, TSS and oil and grease in high dilutions of POME was observed as compared to the lower dilutions of POME.