TRANSFORMATION OF NITROGEN AND SULPHUR COMPOUNDS IN MUNICIPAL WASTEWATER UNDER CHANGING ANOXIC/ANAEROBIC CONDITIONS

By

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DECLARATION BY THE CANDIDATE

I MUHAMMAD HAZRIN BIN YACOB, 2006876894 confirm that the work is my own and that appropriate credit has been given where reference has been made to the works of others.

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ABSTRACT

The formation of hydrogen sulphide in the sewer networks is caused by anaerobic processes. It leads to various problems namely corrosion, health risk and odor. Anoxic processes are proven effective in previous studies in controlling its formation. However the lack of fundamental knowledge on the pathway and kinetics of anoxic/anaerobic transformations of wastewater in sewers inhibits the engineering applications of hydrogen sulphide control. This study focus on establishing the transformation rates of selected nitrogen and sulphur compounds during transformation of wastewater under changing anoxic/anaerobic conditions. It involved taking wastewater samples from the inlet of the wastewater treatment plant located at Mawar College, UiTM and running of batch biofilm reactors. The wastewater samples were analysed using Ion Chromatograph to determine the concentrations of nitrite, nitrate, sulphate, sulphide and thiosulphate. This study considers transformations taking place in the bulkwater and sewer biofilm phases only. It was found that during anoxic condition, the two stages denitrification did not occur and sulphate had undergone oxidation and reduction process. It was established that under anoxic conditions, the transformation rates of NO_3-N, NO_2-N, SO_4-S, SO_3-S and S_2O_3-S are 0.8, 0.06, 0.06, 0 and 0 mg/l/hr respectively. On the other hand, under anaerobic conditions, the transformation rates of NO_3-N, NO_2-N, SO_4-S, SO_3-S and S_2O_3-S are 0, 0, 0.03, 0 and 0 mg/l/hr respectively.

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