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EFFECT OF ORGANIC CARBON LOADING (OCL) ON SIMULTANEOUS NH_4^+-N AND Mn^{2+} REMOVAL IN DRINKING WATER USING A BAF SYSTEM

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Abstract

The effect of organic carbon loadings (OCLs) on NH_4^+-N and Mn^{2+} removal was investigated using a novel approach of biological aerated filter (BAF) for drinking water treatment system. Three different OCLs of 0.2, 0.5 and 1.0 kg COD/m^3.d were loaded into BAF which was operated in batch-wise at 24 h hydraulic retention time. The experiments resulted in higher COD, NH_4^+-N and Mn^{2+} removal percentages at OCL of 1.0 kg COD/m^3.d with removal of 97.1%, 97.4% and 94.7%, respectively. The NH_4^+-N effluent concentration at this phase was lower than Malaysian standard of 1.1 mg NH_4^+-N/L and as for Mn^{2+}, the effluent was 0.3 Mn^{2+} mg/L. However, at lower OCLs of 0.2 and 0.5 kg COD/m^3.d, the removals were only 47.6% and 93.1% for NH_4^+-N and 35.4% and 44.2% for Mn^{2+}, respectively. Therefore, increasing organic carbon loaded to BAF system has increased the simultaneous NH_4^+-N and Mn^{2+} removal degree in drinking water.

Key words: biological aerated filter, drinking water treatment, organic carbon loading, simultaneous ammonia and manganese removal

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