NJ-034 EFFECTS OF TRITON X-100 ON EFFICIENCY OF PACKED CAGE RBC SYSTEM

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The efficiency of packed cage RBC system for treating synthetic industrial wastewater which was contaminated with various concentration of nonionic surfactant (Triton X-100) were investigated. The experiments were done by using laboratory scale packed cage RBC system. The synthetic wastewater was prepared at BOD, concentration of 400 mg/L And the concentration of Triton X-100 in above wastewater were 0.05 mg/l, 0.10 mg/l and 0.25 mg/l The packed cage RBC system was operated under 3 rpm of packed cage drum rotating speed. And hydraulic retention times (HRT) of system were 8, 12 and 16 hrs.

The results showed that (the COD and BOD<sub>5</sub> removal efficiencies of packed cage RBC system, was operated with 0.25 mg/l Triton X-100 contained wastewater and non-Triton X-100 contained wastewater under HRT of 16 hrs were 84.83% and 87.93 % and 94.63% and 95.77%, respectively. The Triton X-100 could be removed by this biological packed cage RBC system at HRT of 16 hrs as the removal efficiencies of 86.00%, 85.00% and 88.80% when wastewater were contained Triton X-100 as concentration of 0.05 mg/l, 0.10 mg/l and 0.25 mg/l, respectively. The Triton X-100 concentration in wastewater was increased, the effluent SS was increased. The effluent SS from reactor No. 1 that was operated with 0.25 mg/l Triton X-100 contained wastewater at HRT of 4 hrs, was 60 mg/l It meant that the bio-film could be washed off by effects of Triton X-100. When HRT of system was investigated, the removal efficiency was decreased when HRT was decreased. The BOD<sub>5</sub> removal efficiencies of 0.25 mg/l Triton X-100 contained wastewater at HRT of 8, 12 and 16 hrs were 62.43%, 82.63% and 87.93%, respectively. When the morphology of bio-film was investigated, at the lowest HRT (8hrs) and highest concentration of Triton X-100 (0.25 mg/l), the color of bio-film in reactor No. 1 was dark-brown. Because, the type of microorganisms were anaerobic microorganisms. However, the bio-film in reactor No.2 was red-brown and the dissolved oxygen was increased up to 3.50-4.00 ing/I, even the initial Triton X-100 concentration of wastewater was up to 0.25 mg/l and the HRT of the system was lowest (8 hrs). It could be concluded that this designed packed cage RBC system could be used for treating cosmetic industries wastewater which contained BOD<sub>5</sub> as concentration of 400 mg/l and Triton X-100 as concentration of up to 0.25 mg/l under HRT of only 8 hrs. And also, the microorganisms in reactor No. 2 were aerobic microorganisms, although, microorganisms in reactor No. 1 was changed to be anaerobic microorganisms when the concentration of Triton X-100 was increased and HRT of the system was decreased.