Thesis Title	Efficiency of Packed Cage RBC for Treating Surfactant Contaminated Wastewater
Thesis Credits	6
Candidate	Miss Panthong Srikattanaprom
Supervisor	Assist. Prof. Dr. Suntud Sirianapaiboon
Degree of Study	Master of Science
Department	Environmental Technology
Academic Year	1999

Abstract

The study was concerned in the efficiencies and optimal conditions of Packed Cage RBC system for treating wastewater while contained various concentrations of surfactant. The experiment were carried out in laboratory scale packed cage RBC system .The system was consisted of 2 reactor which was series connected. In each reactor, the cyrindical biodrum was installed in the 43 liter reactor (40 % of biodrum was submerge in the water). The media which was packed in the biodrum was polyethylene square ring type. The total surface areas of media was 12.67 m^3 . The rotary speed was 3 rpm. The synthetic wastewater which used in this experiments had initial BOD_5 concentration as 400 mg/L and various initial surfactant concentrations as 0.05, 0.1 and 0.25 mg/L. Two types of surfactants were used as non-ionic (Triton X-100) and an-ionic (SDS) HRT of each reactor of the system was operated as 4, 6 and 8 hours.

The results showed that the wastewater which had non-ionic surfactant as the concentration of 0.05 mg/L, the system could remove BOD_5 at highest efficiency (92.30%) at HRT of 16 hrs. When the concentration of non-ionic surfactant was increased to 0.1 and 0.25 mg/L, the system could remove BOD_5 as 89.27% and 87.93%, respectively at the HRT of 16 hrs. And the system could remove non-ionic surfactant as 90.83% at HRT of 12 hrs when the initial concentration of non-ionic surfactant as 0.25 mg/L. For the an-ionic surfactant, the system could remove BOD_5 as 93.92% at HRT of 16 hrs when the initial concentration of the surfactant was 0.05 mg/L. When the an-ionic surfactant in the wastewater was increased up to 0.1 and 0.5 mg/L the BOD_5 removal efficiencies was reduced to 84.15% and 61.95%, respectively at HRT of 8

hrs. In the case of an-ionic surfactant removal efficiencies, the system could removal surfactant as 90.04% at HRT 8 hrs when the initial concentration of the surfactant was 0.05 mg/L. When the surfactant concentration was increased up to 0.25 mg/L, the system could removal surfactant as 65.20% at HRT 8 hrs. For the results aboved, it could be conclude that the system could removed an-ionic surfactant even the concentration of surfactant was up to 0.25 mg/L but in the case of non-ionic surfactant, The removal efficiency was effected by the concentration of surfactant.

For the determination of effluent SS of the system, the effluent SS of the system when the wastewater contained an-ionic surfactant was higher than in the case of non-ionic surfactant. For example, Effluent SS from reactor No. 1 and No. 2 were 12 mg/L and 4.6 mg/L when the wastewater was contained 0.25 mg/L for non-ionic surfactant, HRT of 12 hrs. Effluent SS from reactor No. 1 and No. 2 were 51 mg/L and 7 mg/L when the wastewater was contained 0.25 mg/L for an-ionic surfactant, HRT of 12 hrs. For the morphology of biofilm, the color of biofilm was change due to the organic loading. For example, at the organic loading of 4.07 gBOD/m^2, the color biofilm at the top of biodrum was dark.

Keywords : Packed Cage RBC / Biological treatment of surfactant / Biological treatment of organic matter / Hydraulic retention time.