Estimation of the Impact of Anionic Surfactants on Activated Sludge Flocs Morphology in a Batch System – Ewa Liwarska-Bizukojc, Marcin Bizukojc

Summary

In this study the effect of anionic surfactants on the morphology of activated sludge flocs and biomass activity is quantitatively described. Three anionic surfactants: sodium dodecyl sulphate, sodium alkylbenzene sulphonate and sodium alkyltrioxyethylene sulphate were tested. The batch experiments were performed for a wide range of initial concentrations of anionics in wastewater from 2.5 to 2500 $mg \cdot dm^{-3}$. In spite of different chemical structure the action of all tested anionic surfactants resulted in decrease of activated sludge flocs dimensions at the similar level. It occurred that in the range of anionics concentrations, which are typical for domestic wastewater (2.5–25 $mg \cdot dm^{-3}$), they contributed to the decrease of mean projected area of flocs by about 30%, whereas at the concentrations of 250 and 2500 $mg \cdot dm^{-3}$ mean projected area decreased usually by 50–60%. Sodium alkylbenzene sulphonate exerted the strongest inhibition effect on dehydrogenase activity of activated sludge biomass. This effect coincided with the decreased degrees of removal for this surfactant and its biodegradation products, especially at its lower initial concentrations in wastewater.