عنوان مقاله:

Hydrodynamic analysis of a biofilter affected by biofilm growth

محل انتشار:

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خلاصه مقاله:

Biofilters are used to treat liquid waste effluents or gas waste streams. A high biomass concentration can be maintained within systems treating fluids with attached microorganisms that lead to an efficient treatment with a more compact treatment system. The great problem in biofiltration systems remains that in many cases the growth of the biofilm cannot be effectively controlled. The biofilm growth leads to a progressive clogging of the biofilter resulting in changes of the effective porosity, the hydraulic conductivity, and the dispersivity. The bioreactor clogging increases the pressure loss and makes the system discontinuous. In this research, the hydrodynamic properties influenced by biofilm growth are verified in an experimental biofilter apparatus on a laboratory scale. For this reason three flow rates of 5, 10 and 20 liter/hour were applied through the packed bed in laminar regime. Phenol has been selected as a carbon source for the microorganisms in concentration of 200 ppm. The Results showed that the reduction of permeability is very sharp as soon as the biofilm appears, and this sharp decrease seems related with the existence of biopolymers. The relationships between permeability and porosity allowed the reconstruction of the porosity and biomass concentration profiles from the pressure loss measured during the experiments

کلمات کلیدی:

biofilter, biofilm, permeability reduction, bioclogging