

Analysis of the Fouling Index in Adsorption-Submerged MF Membrane Hybrid System

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Fouling phenomena have been characterized by using many parameters such as the silting index, the plugging index, the fouling index and the membrane filtration index. However, the general limitation of these methods is the requirement of long time. Hence, we focused on the minimization of the time required to evaluate the fouling through the modification of fouling index. The pressure and effluent volume variation were precisely obtained for short time, under various operating conditions including powdered activated carbon (PAC) dose, permeate flow rate, pH of the feed solution, feed temperature etc. It was found that addition of PAC significantly lowered the rate of flux decline because of the adsorption of organics dissolved in water. In addition, the larger PAC particles were deposited selectively on the MF surface at faster rates than the finer particles. The boundary layer composed of larger particles has a higher porosity than the upper one of finer particles.