

Effect of Hydraulic Residence Time on Aromatic Petrochemical Wastewater Treatment Using Pilot-Scale Submerged Membrane Bioreactor

Authors : Fatemeh Yousefi, Narges Fallah, Mohsen Kian, Mehrzad Pakzadeh

Abstract : The petrochemical complex releases wastewater, which is rich in organic pollutants and could not be treated easily. Treatment of the wastewater from a petrochemical industry has been investigated using a submerged membrane bioreactor (MBR). For this purpose, a pilot-scale submerged MBR with a flat-sheet ultrafiltration membrane was used for treatment of petrochemical wastewater according to Bandar Imam Petrochemical complex (BIPC) Aromatic plant. The testing system ran continuously (24-h) over 6 months. Trials on different membrane fluxes and hydraulic retention time (HRT) were conducted and the performance evaluation of the system was done. During the 167 days operation of the MBR at hydraulic retention time (HRT) of 18, 12, 6, and 3 and at an infinite sludge retention time (SRT), the MBR effluent quality consistently met the requirement for discharge to the environment. A fluxes of 6.51 and 13.02 L m⁻² h⁻¹ (LMH) was sustainable and HRT of 6 and 12 h corresponding to these fluxes were applicable. Membrane permeability could be fully recovered after cleaning. In addition, there was no foaming issue in the process. It was concluded that it was feasible to treat the wastewater using submersed MBR technology.

Keywords : membrane bioreactor (MBR), petrochemical wastewater, COD removal, biological treatment

Conference Title : ICBBB 2015 : International Conference on Bioscience, Biotechnology, and Biochemistry

Conference Location : Paris, France

Conference Dates : January 23-24, 2015