عنوان مقاله:

Permeation enhancement and evaluation of ultrafiltration membranes for oily wastewater treatment

محل انتشار:

دومین کنفرانس بین المللی یافته های نوین پژوهشی در شیمی و مهندسی شیمی (سال: 1395)

تعداد صفحات اصل مقاله: 13

نویسندگان:

Fatemeh Rekabdar - *Polymer Science and Technology Division, Research Institute of Petroleum Industry (RIPI), West Blvd., Near Azadi Sports Complex, Tehran, Iran*

Abdolhamid Salahi - *Polymer Science and Technology Division, Research Institute of Petroleum Industry (RIPI), West Blvd., Near Azadi Sports Complex, Tehran, Iran*

Ghader Khanbabayee - *Polymer Science and Technology Division, Research Institute of Petroleum Industry (RIPI), West Blvd., Near Azadi Sports Complex, Tehran, Iran*

Maryam Tavakolmoghadam - *Polymer Science and Technology Division, Research Institute of Petroleum Industry (RIPI), West Blvd., Near Azadi Sports Complex, Tehran, Iran*

خلاصه مقاله:

Separation of oily wastewater of API unit in Tehran refinery was carried out using cross-flow ultrafiltration (UF). Two types of hydrophilic membranes; polysulfone (PS, 30kDa) and polyacrylonitrile (PAN, 20kDa) were employed in all the experiments. Performance of both membranes in wastewater treatment was compared. The PAN membrane showed higher rejection, permeate flux and porosity of cake layer than the PS membrane. Analysis of the UF process showed 99.7%, 77.2%, 63.3%, 65.4%, 29.8%, 100% and 99.5% reductions of oil and grease content, TOC, COD, BOD5, TDS, TSS and turbidity, respectively. A major important problem in the application of UF process technology for treatment of oily wastewater is membrane fouling. Therefore, effect of N2 injection on elimination of fouling on membrane surface in the lab scale was investigated. The result shows that, N2 injection was effective method for removal and increasing permeation flux. In this work, the fouling mechanism on the membrane surface and/or into its porous structure was analyzed. It was seen that an initial intense flux decline due to external blockage followed by an internal deposition or the formation of a cake. It was found that porosity decreased and specific cake resistance increased with the increase in the time.

کلمات کلیدی:

Oily wastewater; Ultrafiltration; Fouling; Pore-blocking