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TREATMENT OF SYNTHETIC OILY WASTEWATERS BY COAGULATION - MF HYBRID PROCESS USING MULLITE - ALUMINA CERAMIC MEMBRANES

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Abstract

In this research, effects of in-line coagulation on permeation flux (PF), flux reduction (FR) and total organic compound rejection (TOC R) of synthesized mullite-alumina MF ceramic membrane (with 50 wt % alumina content) during treatment of synthetic oily wastewater in were investigated. Four coagulants ((ferrous chloride (FeCl₂.4H₂O), ferrous sulphate (FeSO₄.7H₂O), aluminum chloride (AlCl₃.6H₂O) and aluminum sulphate (Al₂(SO₄)₃.18H₂O)) plus equal concentration of slaked lime in form of calcium hydroxide (Ca(OH)₂) were examined in the coagulation – MF hybrid process at different concentrations (0, 50, 100 and 200 ppm). At the best condition (200 ppm of ferrous sulphate plus slaked lime), PF increased from 118.32 to 212.55 (L m⁻² h⁻¹), FR decreased from 58.5 % to 17.82 % and TOC R increased from 89.6 % to 92.5%.

Key words: ceramic membranes, coagulation, hybrid process, microfiltration (MF), synthetic oily wastewater treatment

Received: April, 2014; Revised final: July, 2014; Accepted: July, 2014; Published in final edited form: March 2018

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