

Preparasi membran mix-matrix PVDF/PVP untuk pengolahan air limbah berminyak: pengaruh rasio massa PVDF/PVP = Preparation of PVDF/PVP mix-matrix membrane for Oily Wastewater treatment: effect of PVDF/PVP mass ratio

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Abstrak

gram. Pada penelitian ini membran PVDF/PVP digunakan pada proses ultrafiltrasi untuk mengolah limbah air berminyak yang sudah diolah melalui koagulasi-flokulasi menggunakan koagulan PAC dengan konsentrasi 500 ppm. Proses ultrafiltrasi menggunakan variasi tekanan 1, 2, dan 3 bar. Limbah air berminyak memiliki karakteristik awal COD 99,316 mg/L; pH 6.1; TSS 194 mg/L; TDS 10,280 mg/L; dan kekeruhan 185 FAU. Hasil penelitian menunjukkan bahwa penyisihan parameter limbah yang paling sesuai dengan baku mutu dengan fluks permeat terbesar terdapat pada komposisi larutan cetak 0.05 PVP dan tekanan umpan 3 bar dengan penyisihan COD 42.43%, TSS 90.38%, kekeruhan 87.50%, dan pH akhir 6.91. The oily wastewater contains high levels of contaminants such as COD, TDS, TSS, pH, and turbidity and tends to have a thick color. Therefore, further waste treatment is needed. This research will discuss the application of membrane technology in treating oily wastewater. This study prepared polyvinylidene fluoride (PVDF) ultrafiltration membranes made by phase inversion technique with N,N, dimethylacetamide (DMAc), and polyvinylpyrrolidone (PVP) additives. Membranes were made with variations in the amount of PVP 0.05; 0.15; 0.25; and 0.35 grams. The PVDF/PVP membranes were used in the ultrafiltration process to treat oily wastewater, which had been pre-treated by coagulation-flocculation using a PAC coagulant with a concentration of 500 ppm. The ultrafiltration processes were conducted at the trans-membrane pressure of 1, 2, and 3 bar. The initial oily wastewater has the characteristics of COD 99,316 mg/L; pH 6.1; TSS 194 mg/L; TDS 10,280 mg/L; and turbidity 185 FAU. The results showed that the best waste parameter allowance according to the quality standard with the most significant permeate flux was found in the composition of 0.05 PVP printing solution and 3 bar feed pressure with 42.43% COD removal; 90.38% TSS; 87.50% turbidity; and the final pH of 6.91.