



## Fouling behavior of urban sewage on binary blend PVDF UF membrane

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### ABSTRACT

Polyvinylidene fluoride (PVDF) ultrafiltration membranes with better performance were prepared by blending with PVA, polyvinylpyrrolidone, polyethylene glycol, and polymethylmethacrylate through phase inversion via immersion precipitation method. Phase inversion progress of membranes was investigated through light transmittance experiment. Membrane components and morphologies were analyzed by FTIR, scanning electron microscopy, and atomic force microscopy, respectively. Membrane performance was evaluated in terms of pure water permeation, BSA rejection, and water contact angle. Membranes fouling behavior was evaluated according to dynamic fouling resistance analysis, using secondary effluent of urban sewage as separation object. The results showed that PVDF UF membranes with high hydrophilicity, dense surface, and through macrovoids in cross-section had small sewage flux decline and low fouling during filtration, and the main fouling resistance was due to concentration polarization and cake layer resistance, and membrane fouling was reversible. While the UF membranes with porous surface, not through internal macrovoids, and loose sponge-like structure were trend to bring about pore plugging resistance, and membrane fouling was irreversible. The surface roughness had certain influence on the antifouling performance of PVDF UF membranes.

*Keywords:* PVDF; Blend UF membranes; Secondary effluent of urban sewage; Antifouling

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