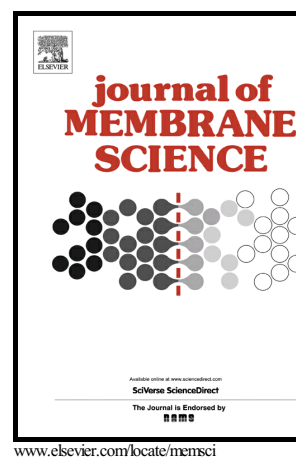


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Antifouling PVDF membrane with hydrophilic surface of terry pile-like structure

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Abstract: A well-defined triblock copolymer poly(methyl methacrylate)-block-poly(ethylene glycol)-block-poly(methyl methacrylate) (PMMA-b-PEG-b-PMMA) synthesized via atom transfer radical polymerization was employed for the antifouling modification of poly(vinylidene fluoride) (PVDF) membrane by facile blending method. Novel terry pile-like structure of amphiphilic copolymer PMMA-b-PEG-b-PMMA was proposed to be formed on membrane surface due to the segregation behavior of the amphiphilic copolymer as verified by X-ray photoelectron spectroscopy analysis. The antifouling properties of the modified membranes were improved remarkably due to the formation of uniform hydrate layer as confirmed by water contact measurement. The permeation results showed that membranes blended with the amphiphilic copolymer exhibited higher water flux (up to 150%), higher BSA solution flux (up to 330%) and higher flux recovery ratio (up to 97%) than pure PVDF membrane, while BSA rejection ratio remained more or less the same. These results provide a promising competency of PVDF composite membrane in waste water treatment and water purification.

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