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Structures and antifouling properties of polyvinyl chloride/poly(methyl methacrylate)-*graft*-poly(ethylene glycol) blend membranes formed in different coagulation media

Li-Feng Fang^{a, b}, Bao-Ku Zhu^{a,*}, Li-Ping Zhu^a, Hideto Matsuyama^b, Shuaifei Zhao^{b, c}

^aEngineering Research Center for Membrane and Water Treatment (MOE), Department of Polymer Science and Engineering, Zhejiang University, Hangzhou 310027, China

^bCenter for Membrane and Film Technology, Department of Chemical Science and Engineering, Kobe University, Rokkodaicho 1-1, Nada, Kobe 657-8501, Japan

^cDepartment of Environmental Sciences, Faculty of Science and Engineering, Macquarie University, Sydney, NSW 2109, Australia

*Corresponding author: zhubk@zju.edu.cn

Abstract

Two new amphiphilic copolymers poly(methyl methacrylate-*graft*-poly(ethylene glycol) methacrylate) (PMMA-*g*-PEG) are synthesized and blended into polyvinyl chloride (PVC) to prepare membranes in different coagulation media (water and ethanol) via the non-solvent induced phase separation method. The prepared membranes are characterized by X-ray photoelectron spectroscopy, proton nuclear magnetic resonance, scanning electron microscopy, atomic force microscopy and water contact angle measurement. Their separation performance and fouling resistance (by protein adsorption and foulant filtration) are also compared. It is found that the membrane hydrophilicity is significantly increased by blending amphiphilic copolymer due to the introduction of hydrophilic poly(ethylene glycol) (PEG)

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