

## Author's Accepted Manuscript

Novel Anion Exchange Membranes based on Quaternized Diblock Copolystyrene containing a Fluorinated Hydrophobic Block

Meng Zhu, Xiaojuan Zhang, Yiguang Wang, Yibo Wu, Hao Wang, Min Zhang, Quan Chen, Zichao Shen, Nanwen Li



PII: S0376-7388(17)32599-1  
DOI: <https://doi.org/10.1016/j.memsci.2018.01.055>  
Reference: MEMSCI15909

To appear in: *Journal of Membrane Science*

Received date: 10 September 2017  
Revised date: 18 January 2018  
Accepted date: 22 January 2018

Cite this article as: Meng Zhu, Xiaojuan Zhang, Yiguang Wang, Yibo Wu, Hao Wang, Min Zhang, Quan Chen, Zichao Shen and Nanwen Li, Novel Anion Exchange Membranes based on Quaternized Diblock Copolystyrene containing a Fluorinated Hydrophobic Block, *Journal of Membrane Science*, <https://doi.org/10.1016/j.memsci.2018.01.055>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Novel Anion Exchange Membranes based on Quaternized Diblock Copolystyrene containing a Fluorinated Hydrophobic Block

Meng Zhu<sup>a</sup>, Xiaojuan Zhang<sup>a</sup>, Yiguang Wang<sup>a,\*</sup>, Yibo Wu<sup>b,e</sup>, Hao Wang<sup>b,e</sup>, Min Zhang<sup>b,e</sup>, Min Zhang<sup>b,e,\*</sup>, Quan Chen<sup>d</sup>, Zichao Shen<sup>a</sup> and Nanwen Li<sup>c,\*</sup>

<sup>a</sup> Science and Technology on Thermostructural Composite Materials Laboratory, Northwestern Polytechnical University, Xi'an, 710072, China.

<sup>b</sup> College of Materials Science and Engineering, Beijing Institute of Petrochemical Technology, Beijing, 102617, China.

<sup>c</sup> State Key Laboratory of Coal Conversion, Institute of Coal Chemistry, Chinese Academy of Sciences, Taiyuan, 030001, China.

<sup>d</sup> State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, China.

<sup>e</sup> Beijing Key Lab of Special Elastomeric Composite Materials, Beijing, 102617, China.

wangyiguang@nwpu.edu.cn

zm0127@bipt.edu.cn

linanwen@sxicc.ac.cn

## Abstract

With the aim to enhance the hydrophilic–hydrophobic separation and thus improve the anion conductivity of diblock copolymer anion exchange membranes (AEMs), a fluorinated hydrophobic block was introduced into quaternized diblock copolystyrene. Two fluoro-containing monomers (i.e., 4-fluorostyrene (4FS) and 2, 3, 4, 5, 6-pentafluorostyrene (PFS)) were polymerized into a poly(4-vinyl benzyl chloride)-based macroinitiator (Macro-PVBC<sub>263</sub>) via reversible addition–fragmentation chain transfer (RAFT) polymerization. This route led to the corresponding diblock copolymers PVBC<sub>263</sub>-*b*-P4FS<sub>y</sub> and PVBC<sub>263</sub>-*b*-PPFS<sub>y</sub>, which served to prepare AEMs (i.e., PVBC<sub>263</sub>-*b*-PPFS<sub>y</sub>-OH and PVBC<sub>263</sub>-*b*-P4FS<sub>y</sub>-OH, respectively) via quaternization with trimethyl amine (TMA) and subsequent ion-exchange. As expected, the as-obtained AEMs showed well-defined lamellar morphologies, as revealed by small-angle X-ray scattering (SAXS) and atomic force microscopy (AFM). Consequently, all the fluorinated diblock copolymer-based AEMs showed

Download English Version:

<https://daneshyari.com/en/article/7019972>

Download Persian Version:

<https://daneshyari.com/article/7019972>

[Daneshyari.com](https://daneshyari.com)