

Author's Accepted Manuscript

Effect of Block Copolymer Morphology Controlled by Casting-Solvent Quality on Pervaporation of Butanol/Water Mixtures

Chaeyoung Shin, X. Chelsea Chen, John M. Prausnitz, Nitash P. Balsara



PII: S0376-7388(16)30487-2
DOI: <http://dx.doi.org/10.1016/j.memsci.2016.09.054>
Reference: MEMSCI14775

To appear in: *Journal of Membrane Science*

Received date: 27 May 2016
Revised date: 1 September 2016
Accepted date: 12 September 2016

Cite this article as: Chaeyoung Shin, X. Chelsea Chen, John M. Prausnitz and Nitash P. Balsara, Effect of Block Copolymer Morphology Controlled by Casting-Solvent Quality on Pervaporation of Butanol/Water Mixtures, *Journal of Membrane Science*, <http://dx.doi.org/10.1016/j.memsci.2016.09.054>

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.

Effect of Block Copolymer Morphology Controlled by Casting-Solvent Quality on Pervaporation of Butanol/Water Mixtures

Chaeyoung Shin^{a,b}, X. Chelsea Chen^{a,b,c}, John M. Prausnitz^a, Nitash P. Balsara^{a,b,c*}

^aDepartment of Chemical and Biomolecular Engineering, University of California, Berkeley, California 94720, USA

^bEnergy Biosciences Institute, University of California, Berkeley, California 94704, USA

^cMaterials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720, USA

*Corresponding author: Balsara, Tel.: +510 642 8937. nbalsara@berkeley.edu

Abstract

Motivated by the need for developing membranes for biofuel purification, we made pervaporation membranes by casting a polystyrene-*b*-polydimethylsiloxane-*b*-polystyrene (SDS) triblock copolymer using toluene, cyclohexane, and hexane as casting solvents. The three solvents have different affinities for each of the blocks of the SDS, which enables the creation of membranes with different nano-morphologies using the same block copolymer. These membranes were used in pervaporation experiments with butanol/water mixtures as the feed solution. We quantify the effect of morphology on butanol and water permeabilities. Butanol permeability was a more sensitive function of morphology than water permeability. Butanol

Download English Version:

<https://daneshyari.com/en/article/4989087>

Download Persian Version:

<https://daneshyari.com/article/4989087>

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