Abstracts

Synthesis of Poly(amide-imide)/Polydimethylsiloxane Graft Copolymer and the Effect of Mixing with Silicalite on the Pervaporation Property

by

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(Received on March 31, 2004 & accepted on May 26, 2004)

Abstract

The synthesis of a polydimethylsiloxane-grafted poly(amide-imide) (PAI-g-PDMS) copolymer was carried out by the polycondensation of a diazino-terminated PDMS macromonomer with trimellitic dianhydride chloride followed by chemical imidation. The copolymer membrane and the hybrid membrane with silicalite were prepared by a solvent casting method using NMP solutions, and the pervaporation properties of these membranes were evaluated. These membranes were found to exhibit the organic-permeability in the pervaporation of aqueous alcohols and acetone solutions, and the selectivity of PAI-g-PDMS membranes increased with an increase of PDMS content. In addition, the PAI-g-PDMS/silicalite hybrid membrane exhibited the higher organic-permeability than the PAI-g-PDMS membrane. Therefore, such a hybrid membrane is expected to be a highly selective and durable pervaporation membrane.

Keywords: Poly(amide-imide), Polydimethylsiloxane, Graft copolymer, Silicalite, Hybrid membrane, Pervaporation

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Photoreactivity of aromatic polyamide as a liquid crystal photoalignment film

by

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(Received on March 31, 2004 & accepted on May 26, 2004)

Abstract

We have found that the uniform and stable alignment of liquid crystal (LC) molecules was achieved on aromatic polyamide films exposed to linearly polarized ultraviolet (UV) light, although these polyamides had no common photoreactive group such as cinnamoyl, coumarin or azo chromophore. In this study, in order to clarify the mechanism of the photoreaction on the surface of aromatic polyamide thin films, the measurements of fluorescence spectra and X-ray photoelectron spectroscopy (XPS) were carried out for the polyamide films before and after UV light irradiation. The results showed that the luminescence intensity was decreased by UV light irradiation, and the oxygen content increased in the XPS analysis of the polyamide surface after UV light irradiation. Therefore, it was concluded that the photo-oxidation reaction would occur on the amide group of aromatic polyamide via proton transfer according to UV light irradiation.

Keywords: Photoinduced alignment, Aromatic polyamide, Photoreaction, Liquid crystal display device.

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