

Abstract Submitted
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Cloisite 30B as Nanoclay Compatibilizer for Polysulfone/Polyimide Blend Films. ALI AMMAR, Akron Univ, AHMED ELZATAHRY, MARIAM AL-MAADEED, Qatar Univ, ABDUL-LAH ALENIZI, King Saud Univ, KARIM ALAMGIR, Akron Univ — Polysulfone (PSF) and polyimide (PI) are used in many applications including membranes for gas separation and water purification. The phase separation issues limit the blend application of these polymers. We studied the effect of nanoclay and Cloisite 30B had on (PSF/PI) films. This was done in order to examine the compatibility effects of clay on phase separation behavior, mechanical strength, and structure properties. The addition of weight percentage of organoclay strongly compatibilized the blend phases for all compositions, decreasing the scale of blend phase separation by a factor of 5-10. Interestingly, the net phase separated domain area converged to the 50% blend composition in all cases. This is attributed to a high degree of exfoliation and degradation of nanoclay particles within the PSF/PI matrix as well as interfacial regions, independent of the blend composition. AFM confirmed these optically observed compatibilization effects by quantitative reduction of aspect ratio (width/height) of surface phase separated domains. The surface free energies of the films decreased by adding C30B. This has led us to conclude that there is a changing of surface topography, which conformed to the contact angle. PSF/PI films showed decreasing in thermal stability due to the surfactant modification of C30B.

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