

전처리 조건에 따른 PET 섬유 집합체의 가수분해 및 흡수성 거동 연구

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Pretreatment condition Optimization of Hydrolysis and Water Absorption Behavior of PET Fibrous Assembly

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Abstract

Applied decanol and nonanol provided more weight loss than applied heptanol and octanol. PET using decanol showed the highest weight loss than other alcohols applied. Sodium hydroxide caused weight loss in PET fabrics because terephthalic acid and ethylene glycol were separated by the hydrolysis of the ester group in the PET chains. The terephthalic acid was neutralized to disodium terephthalate and the reaction results in weight loss in the PET fabrics. The weight loss increased with increasing hydrolysis time because disodium terephthalate was water soluble and the reaction was not reached at equilibrium. Pretreatment alcohols increased water absorption, especially in case of PET applied decanol revealed the highest water absorption. PET applied decanol showed 400% of initial water absorption, and PET applied nonanol revealed 250% of initial water absorption. However, the pristine PET showed 90% initial water absorption, and it revealed 230% maximum water absorption as compared to other alcohols. Also, PET applied decanol, nonanol, octanol and heptanol showed 600%, 400%, 350% and 300% maximum water absorption, respectively.

The result implied alcohol length affected on water absorption of PET fibrous assembly. This implies that the microvoid of the PET surface hold water molecules. Surface morphology of PET appears that the pretreatment reagent attacks almost entire surface of the fiber, causing surface etching. As the surface etching progresses, it propagates inside the fiber, resulting in the formation of elongated cavities on the surface.

참고문헌

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