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Sorption of water vapor of EVAL/PAA blend nano-nonwovens modified by layer-by-layer technique

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ABSTRACT

Nonwovens composed of nanofibers of poly(ethylene-co-vinyl alcohol) (EVAL) blended with poly(acrylic acid) (PAA) were prepared by an electrospinning technique and then crosslinked by a heat treatment. A process for adsorbing alternating polyelectrolytes in solutions, termed the ''layer-by-layer (LBL) technique'', was used to coat the nanofibers in the nonwovens. A combination of electrolytes was used: poly(diallyldimethylammonium chloride) (PDDAC) was used as the cationic polymer and poly(sodium 4-styrenesulfonate) (PSSNa) was used as the anionic polymer for the polycation:polyanion combinations. The water content of the modified nanofiber nonwovens increased with the number of LBL treatments at various relative humidities.

Keywords: Electrospinning; Layer-by-layer; EVAL; Poly(acrylic acid); Water vapor sorption

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