

Abstract Submitted  
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**Morphology and Transport Properties of Novel Polymer Nanocomposites Resulted from Melt Processing of Polyvinylacetate Substrates Coated with Layer-by-Layer Assemblies** IMAN SOLTANI, RICHARD J. SPONTAK, North Carolina State Univ — Novel polymer nanocomposites (PNCs) were processed through layer-by-layer (LBL) deposition of clay and polyethylene terephthalate ionomer layers on polyvinylacetate (PVAc) substrates, followed by repetitive melt pressing of coated samples to crush LBL assemblies into the polymeric matrix. The increase in the clay content in resulted PNCs prepared through similar LBL coatings, relative to previously studied hydrophobic polystyrene-based nanocomposites, postulated superiority of PVAc, with relatively higher hydrophilicity, to interact with LBL assemblies. Also, these PNCs showed relatively good barrier improvement against transport of oxygen and carbon dioxide gases, proposing the scavenging effect of LBL assemblies crushed portions as highly tortuous labyrinths with high aspect ratios, comprising edge-edge flocculated exfoliated clay platelets, observed through transmission electron micrographs. However, combinative morphological investigations through optical microscopy, x-ray diffractometry, and transmission electron microscopy proposed low global dispersion of clay throughout polymeric matrix, conjecturing insufficient intensity of stress applied through cyclic melt pressing, and/or slight thermal degradation of samples via extended times of processing at high temperatures.

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