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Effect of Organic Modifier and Preparation Method on the Morphology and Crystalline Structure of Poly(vinylideneflouride)-Montmorillonite Nanocomposites DOUGLAS DILLON, KISHORE TENNETI, CHRISTOPHER LI, Department of Materials Science and Engineering, Drexel University, Philadelphia, PA 19104 — Polymer-layered silicate nanocomposites have proven to be an effective method of improving the physical properties of many different polymers, but PVDF-clay composites have received relatively little attention. In this study, two commercially available montmorillonite-based nanoclays with different organic modifiers were each used to prepare both solution cast and precipitated PVDF-clay composites from dimethylformamide (DMF) solutions. Structure and morphology of the PVDF-clay nanocomposites have been investigated. Depending on which organically modified nanoclay was used, solution cast composites showed either a phase-separated or a partially intercalated morphology, while precipitating the PVDF with water always yielded a completely exfoliated morphology. For solution cast samples, it has also been observed that the nanoclay layers are parallel to the film surface. The presence of the nanoclay in any morphology promoted the crystallization of PVDF's β polymorph.

Christopher Li
Department of Materials Science and Engineering
Drexel University, Philadelphia, PA 19104

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