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Polyimide/Clay Nanocomposite Films from Dispersions of Polyamic Acid in NMP and Xylene

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The effect of addition of various amounts of xylene on the dispersion of organically modified montmorrilonite clay in polyamic acid/1-methyl-2-pyrrolidone (NMP) solution prior to formation of polyimide/clay nanocomposite film was investigated using optical microscopy and steady shear rheological measurements. The viscosity of the dispersion increased significantly especially in the low shear rate regime upon addition of clay and xylene, indicating good dispersion and exfoliation of the clay particles as confirmed by optical microscopy and XRD spectroscopy of the films. The results suggest that xylene is an efficient dispersion aid of clay in the polyimide/clay nanocomposite system studied. The concentration of and the method of addition of xylene is critical to a good dispersion and preservation of the layered silicate structure of the clay.