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Electrospinning of nanocomposite fibers VAHIK KRIKORIAN, DARRIN POCHAN, University of Delaware and Delaware Biotechnology Institute — Physical properties of a novel biocompatible nanocomposite fiber are investigated. The fibers are fabricated by incorporation of organically modified clay in a fiber electrospinning process. Commercially available Montmorillonite type organoclays with different extent of miscibility with the polymer matrix are employed to study the effect of organic modifier/matrix interactions. The nanocomposite fibers are prepared by electrospinning a suspension of organoclay/dichloromethane with poly(L-lactic acid), PLLA, a widely used biodegradable synthetic polyester. Effect of clay incorporation on fiber diameter, crystallinity and mechanical properties are studied. A high degree of birefringence in polarized light microscopy suggested that the polymer chains in as-spun fibers are highly aligned. However, wide angle x-ray scattering (WAXS) data revealed no crystalline peaks in as-spun fibers. Annealing the samples above the glass transition temperature induces high degree of crystallinity. Based on Scanning electron microscopy (SEM), spun fibers are highly porous, which may be beneficial in biomedical applications, membranes, and reinforcement matrices. Transmission electron microscopy (TEM) data show the ordering of silicate platelets along the fiber axis, consistent with the d-spacings obtained from WAXS. Cold crystallization behavior of as spun nanofibers studied via *in-situ* Fourier Transform Infrared spectroscopy (FTIR) will also be presented.

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