Abstract Submitted
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Polymorphism in electrospun poly(vinylidene fluoride)/nanoclay composite nanofibers[1] LEI YU, PEGGY CEBE, Tufts University — We investigated the morphology and polymorphism behavior of electrospun (ES) composite nanofibers of poly(vinylidene fluoride) (PVDF) with two nanoclays: Lucentite^{TM} STN and SWN. Lucentite^{TM} STN and SWN synthetic nanoclays are based on hectrite structure, but only STN contains an organic modifier between the hectrite layers. The PVDF was dissolved, and nanoclay was dispersed, in N,N-dimethylformamide/acetone and then electrospun into nanofibers with diameters ranging from 100∼1000 nm. The nanoclay content ranged from 0.2% to 10%. The addition of STN can greatly decrease the number of beads and makes the diameter of the ES nanofibers more uniform due to an increase of solution conductivity. From wide angle X-ray scattering and Fourier transform infrared spectroscopy, we found both STN and SWN can induce more beta phase PVDF crystals and TTT conformers, while reducing the alpha phase crystal content in ES PVDF/nanoclay composite nanofibers. STN can completely eliminate the alpha phase crystals, even at low STN content. The ionic organic modifier makes STN much more effective than SWN in promoting beta phase PVDF crystals.

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