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Nanoparticles as Blend Compatibilizers: Layered Silicates and Fullerenes JITENDRA SHARMA, ROMESH PATEL, LIANG XU, RAMANAN KRISHNAMOORTI, Dept of Chemical and Biomolecular Engg., Univ of Houston — Blending of polymers is an excellent way to achieve designer materials that combine specific properties of individual polymers to obtain end product with improved properties. However, processing of such materials many times is confounded by the undesirable large scale phase separation. Recent research has focused on utilizing micron-sized additives like carbon black(1) and glass beads(2) etc., to reduce the interfacial energy and promote mixing. Despite industry-scale success of the method, features like high particle loadings and the subsequent increase in the density of the material is undesirable. Replacement of micron-sized particles with nanoparticles (NPs) and the resultant increase in the interfacial surface to volume ratio potentially helps resolve this issue. We present results from our investigation of the role of two different classes of NPs namely, layered silicates and fullerenes (covering a range of three dimensional architecture and aspect ratio), on the compatibilization of two immiscible polymers of PS and PMMA as probed by AFM.

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