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**Production of Exfoliated Polyethylene-Organoclay Nanocomposites and Its Effect on Mechanical Properties and Thermal Stability.** CYNTHIA PIERRE, JOHN M. TORKELSON, Northwestern University, Evanston, IL 60208 — Low density polyethylene (LDPE)-organoclay nanocomposites as well as linear low density polyethylene (LLDPE)-organoclay nanocomposites are prepared using solid-state shear pulverization (SSSP). The organoclay content in each nanocomposite is 5 wt%. X-ray diffraction indicates that the nanocomposites are exfoliated, because the basal beak at 3.6 degrees for organoclay is nearly eliminated in the nanocomposites made by SSSP. Transmission electron microscopy (TEM) provides further evidence that the nanocomposites are significantly exfoliated. Upon 2 hour annealing at temperatures 25 K above the melt transition of the polymer, x-ray diffraction patterns remain unchanged, indicating that the exfoliated structure of the nanocomposites is kinetically stable in the melt state of the polymer. Due to the stiffness of the clay sheets, the Young's modulus is increase  $\sim 20\%$  by nanocomposite formation. Thermogravimetric analysis reveals that the onset temperature of degradation is increased by  $\sim 5$  K in the nanocomposites and that the initial degradation of the nanocomposites is retarded relative to neat polymer up to 5% loss of sample weight.

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