

Abstract Submitted
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Influence of graphene on the crystallization behavior of polyethylene SHAN CHENG, CHRISTOPHER LI, Drexel University — Recent work on polyethylene(PE)/carbon nanotube nanocomposites demonstrates that CNTs can significantly alter PE crystallization. Graphene, a 2D counterpart of CNT, is an excellent candidate for fabricating polymer nanocomposites. We herein report the influence of graphene on crystallization behavior of PE. High density polyethylene (HDPE) was first crystallized in dilute solution in the presence of dispersed single or few-layer graphene sheets. Epitaxial growth of polyethylene on the basal plane of graphene sheets was observed using transmission electron microscopy. PE/graphene nanocomposites with various graphene loading were then fabricated. Both non-isothermal and isothermal crystallization behavior of these nanocomposites were studied using a differential scanning calorimeter. Multiple melting peaks of the nanocomposite were correlated to homo- and heterogeneous nucleation of PE crystallites. Crystallization kinetics was studied using Avrami equation. The results were compared with carbon nanotube/PE system and the difference will be discussed.

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