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Time-resolved WAXD studies on the crystallization of isotactic polypropylene/graphene nanocomposites SHOTARO NISHITSUJI, MAYA ENDOH, YICHEN GUO, MIRIAM RAFAILOVICH, TADANORI KOGA, Department of Materials Science and Engineering, Stony Brook University — Graphene is one layer of carbon atoms, which has good electronic, thermal conductivity and mechanical properties. By adding graphene to isotactic polypropylene (iPP), the mechanical and electrical properties of the polymer are significantly improved. To further achieve high performance of iPP/graphene nanocomposites (“NCs”), it is important to investigate the relationship between the crystalline structure of iPP and the mechanical property of the iPP/graphene NCs. In this study, the effect of the graphene on the crystallization behavior of the polymer was investigated by using time-resolved wide angle X-ray diffraction (WAXD). The iPP/graphene NCs with different weight ratios of graphene were prepared by using a twin screw extruder. After temperature jump from 210 °C ($>T_m$) to 170 °C, the melt-crystallization process was observed by in situ WAXD. The results showed that the crystalline structure of all the samples was still α -form that is the same as the neat PP, while the ratios of the diffraction peaks are quite different from those of the neat PP. We will discuss the detailed structure in this presentation.

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