

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Investigation of Extensional Flow-induced Crystallization in Entangled Polymer Melts JONG KAHK KEUM, YIMIN MAO, FENG ZUO, BENJAMIN S. HSIAO, Stony Brook University, TEAM — To investigate the extensional flow-induced crystallization in polymer melts by means of synchrotron X-rays, a unique cross-slot flow apparatus has been devised and tested. In-situ wide-angle X-ray diffraction (WAXD) results of isotactic polypropylene (*i*PP) showed that the formation of crystallization precursor structure (i.e., shish-kebab structure) under extensional flow is strongly governed by applied strain as well as strain rate. A critical strain, ε_c , exists in the formation of flow-induced crystallization precursor structure. Below ε_c , no shish-kebab structure can be formed even when the applied strain rate, $\dot{\varepsilon}$ is higher than the critical strain rate, $\dot{\varepsilon}_c$. Results also confirmed that the crystalline shish precursor structure is formed first and it induces the growth of folded-chain lamellae, i.e. kebabs.

Jong Keum
Stony Brook University

Date submitted: 27 Nov 2007

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