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Tuning mechanical properties of weakly-phase-separated olefin block copolymer by establishing co-crystallization structure with the aid of linear polyethylene: the dependence on molecular chain length

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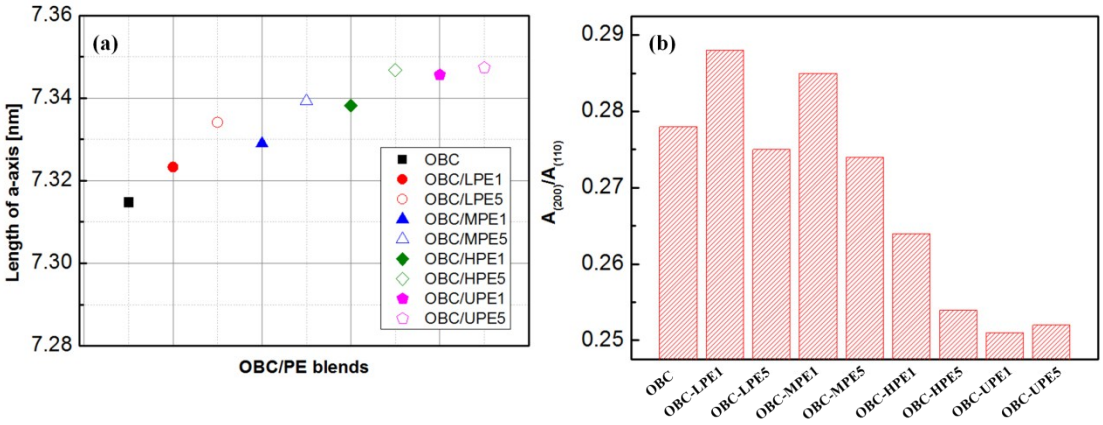

Figure S1. (a). change of the length of a-axis of PE mixed crystals as a function of PE content; (b).the area ratio between (200) and (110) reflections for OBC/PE blends.

As can be seen in Figure S1, the length of a-axis gradually increases with the increase of PE content, indicating an obvious a-axis expansion. In addition, OBC/UPE shows a great reduction of $A_{(200)}/A_{(110)}$, reflecting the distorting of crystal lattice and the formation of hexagonal phase.

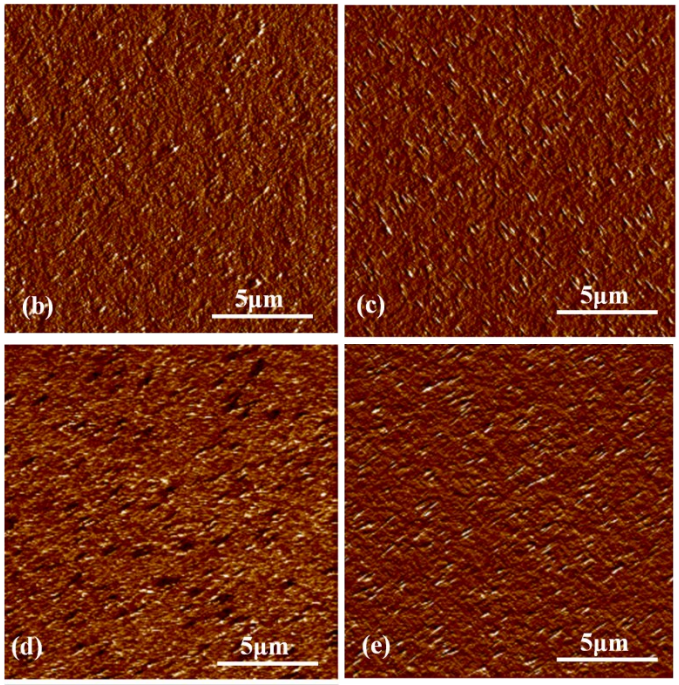

Figure S2. Typical AFM images of OBC/PE samples: (a). OBC-LPE1; (b). OBC-MPE1; (c). OBC-LPE5; (d).OBC-MPE5.

As can be seen in Figure S2, there is no obvious shish-kebab structures in OBC/LPE and OBC/MPE samples. The crystalline morphology of these samples is close to that of OBC/HPE with the same PE content.

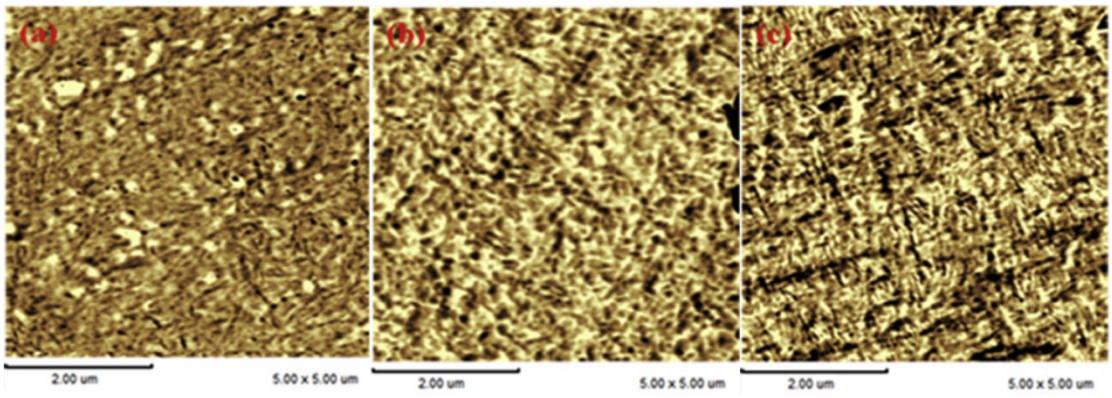

Figure S3. Representative AFM images for injection-molded OBC/UPE samples containing different content of UPE: (a). neat OBC; (b). OBC/UPE1; (c). OBC-UPE5.

As shown in Figure S3, tapping-mode AFM was used to investigate the crystalline morphology of OBC/PE samples. Clear oriented lamellar structure along with some spherulites can be found in neat OBC. For OBC/UPE1, a small number of shish-kebabs appear along the flow direction. When UPE content reaches 5wt%, the number of shish-kebabs increases and oriented

parallel with each other along the flow direction, indicating a high crystal orientation.