Abstract Submitted
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Stress induced reversible crystal transition in poly(butylene succinate)[1] GUOMING LIU, LIUCHUN ZHENG, XIUQIN ZHANG, CHUNCHENG LI, DUJIN WANG, CAS Key Laboratory of Engineering Plastics, Institute of Chemistry, the Chinese Academy of Sciences, Beijing, 100190, China — The plastic deformation mechanism of semi-crystalline polymers is a long-studied topic, which is crucial for establishing structure/property relationships. For polymers with stress induced crystal transition, some open questions still need to be answered, such as on which stage of plastic deformation does the crystal transition take place, and more importantly, what happens on the lamellar structure during crystal transition. In this talk, stress-induced reversible crystal transition in poly(butylene succinate) was systematically investigated by in-situ WAXS and SAXS. A "lamellar thickening" phenomenon was observed during stretching, which was shown to mainly originated from the reversible crystal transition. This mechanism was shown to be valid in poly(ethylene succinate). The critical stress for the transition was measured in a series of PBS-based crystalline-amorphous multi-block copolymers. Interestingly, these PBS copolymers exhibited identical critical stress independent of amorphous blocks. The universal critical stress for crystal transition was interpreted through a single-microfibril-stretching mechanism.

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Guoming Liu
CAS Key Laboratory of Engineering Plastics, Institute of Chemistry,
the Chinese Academy of Sciences, Beijing, 100190, China

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