

Abstract Submitted
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Deformation across length scales in polyolefines: effect of the chain microstructure on the polymorphism, phase transitions and morphological changes. FINIZIA AURIEMMA, CLAUDIO DE ROSA, ROCCO DI GIROLAMO, ANNA MALAFRONTI, MIRIAM SCOTI, Dipartimento di Scienze Chimiche- Universit di Napoli Federico II-Complesso Monte Sant' Angelo- via Cintia-80126 Napoli — The transformations related to phase changes of the crystals, and at lamellar length scales by effect of tensile deformation are studied in the case of some isotactic polypropylene samples having high molecular mass, polydispersity index ≈ 2 , and stereodefects at different concentrations and with a uniform distribution, The stress induced transformations are followed in real time during stretching through wide and small angle X-ray scattering measurements. The data analysis evidences that during the transformations of the spherulitic into the fibrillar morphology, stress-induced phase transitions occurring during plastic deformation are regulated by the same factors that govern the textural and morphological changes, that is the ability of the entangled amorphous chains to transmit the stress and the intrinsic stability of the lamellar crystals. Since the relative stability of the different polymorphic forms involved in the structural transformations and the intrinsic flexibility of the chains depend on the stereoregularity, precise correlations between the stereoregularity of the chains, and the deformation behavior are outlined, paving the way for understanding the material properties at molecular level.

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