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Study of the crystalline structures of the syndiotactic polystyrene (sPS) under mechanical deformation SUGURU NAGASAKA, ATSUSHI HOTTA, Department of Mechanical Engineering, Keio University, Japan — Polystyrene (PS) has become one of the important, yet complicated semi-crystalline materials since the successful synthesis of the syndiotactic PS (sPS) by Ziegler-Natta catalyst. Since then, sPS has been actively investigated and four different crystalline forms (α , β , γ and δ), two mesomorphic forms and various clathrate forms have been found, indicating complex feature of its crystalline structures. Among the four crystalline forms, α and β -crystals can be obtained by different annealing processes and both crystalline structures comprise the same all-trans planar conformation. In this work, β -crystal structure was made by high temperature annealing and the sPS with β -crystal structure was mechanically stretched above the glass transition temperature of sPS, followed by the crystalline transition analysis studied by FT-IR.

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