

## DISLOCATIONS AND MOLECULAR RELAXATIONS IN IPP

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Crystallographic slip is a basic deformation mechanism in polymer crystals, operating over a wide range of strain levels guided by a dislocation based deformation mechanism. In the present work, the thermal stability of deformation induced dislocations is investigated. In-situ X-ray diffraction experiments during stepwise annealing of pre-deformed alpha-phase Polypropylene samples were performed. The diffraction patterns were analyzed by the Multi reflection X-ray Profile Analysis (MXPA) method, which allows for determining the presence and density of dislocations and the lamellae thickness. The hereby obtained development of the dislocation density as a function of annealing temperature allows for an identification of critical temperatures at which dislocations are being mobilized in alpha-iPP. By combining MXPA with dynamic dynamical mechanical analysis measurements (DMA), it is possible to attribute the thermal stability of dislocations to relaxation processes within the crystalline and the amorphous phase.