

## **Transition in Crystal Structure of Ethylene-Octene Fiber during Heat Treatment**

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The effects of deformation and annealing on the orientation and morphology of crosslinked elastic fibers, spun from a commercial ethylene-octene copolymer were studied using X-ray diffraction. Investigation of phase-structure provides new details on hexagonal to orthogonal phase transitions, in these low-crystallinity ethylene-octene copolymers. The fibers feature a mixed pseudo-hexagonal/orthorhombic structure. Annealing the fibers within the melting range increases the fraction of the orthorhombic phase, producing a pure orthorhombic structure at 60°C. This is accompanied by a maximum in crystal size. Further increase in annealing temperature re-introduces a pseudo-hexagonal fraction. DSC measurements performed in a state of stretch (4x) indicate an increase in crystallinity, with a shift in melting peaks to higher temperatures, indicative of stretch induced crystallization.