

Annealing effects on physical properties and structural changes of poly (lactic acid) fibers

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Poly (lactic acid) (PLA) has been paid much attention as biopolymer of which productivity has reasonable cost effectiveness. Even though PLA has good biodegradability, the weakness of heat resistance is a neck point of success in commercial launch market. Mechanical properties and molecular structure changes of PLA fibers by annealing were investigate in this work. Draw textured yarn of 83 dtex was used in this work. Annealing temperatures of 100 and 160°C was selected, respectively and annealing time varied from 10 to 50 min to control thermal shrinkage. Mechanical properties such as tenacity and elongation at break had little changed by annealing. At annealing temperature of 100°C, thermal shrinkage decreased from 9.3 to 5.3% with increasing annealing time. On the other hand, thermal shrinkage annealed at 160°C was down to 2.3% and little changed with annealing time. Birefringence representing average molecular orientation has little changed with annealing temperature and time. Crystal structure revealed by wide angle X-ray scattering developed at annealing temperature of 160°C. Crystal structure than molecular orientation was more affected by annealing.

Biography

Taehwan has completed his Ph.D at the age of 28 years from Seoul National and has worked for Taekwang Industry and HUVIS from 1998 to 2008. He is a professor of Yeungnam University. He has published more than 20 papers in reputed journals and serving as an editorial board member of Korean Fiber Society.

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