

Anisotropic Characterization of the Drawn and Annealed
PET Film

김성호, 주창환, 임승순, 최영엽

한양대학교 공과대학 섬유공학과

Mechanical properties of the Poly(ethylene terephthalate) films prepared from various draw ratios and annealing temperatures were measured as a function of direction. The anisotropic indices(E_{θ}/E_0) were evaluated to obtain the influence of draw ratio and annealing temperature on the tensile properties of PET films. Using the classic elasticity theory, the equation able to predict the initial modulus(E_{θ}) with respect to any measured angle was derived under the orthotropic assumption, and compared with experimental results. The equation is as follows;

$$1/E_{\theta} = \cos^4\theta/E_0 + \sin^4\theta/E_{90} + (4/E_{45} - 1/E_0 - 1/E_{90}) \cos^2\theta\sin^2\theta$$

To interpret the fracture behavior of the various conditions, the fracture angles and shapes were investigated with the aid of Scanning Electron Microscopy(SEM).