

Residual Stress Behaviors of Colorless and Transparent Polyimide Thin Films

남기호, 이완수, 한학수*

연세대학교

(hshan@yonsei.ac.kr*)

A series of polyimide (PI) was prepared by reacting 4,4'-(hexafluoroisopropylidene)-diphthalic anhydride (6FDA) as the anhydride and bis(4-aminophenyl) sulfone (APS), bis[4-(3-aminophenoxy)-phenyl] sulfone (BAPS), 2,2-bis(4-aminophenyl)-hexafluoropropane (6FPD), and 2,2-bis[4-(4-aminophenoxy)-phenyl] hexafluoropropane (6FBAPP), as the diamine. Residual stress behaviors were detected in-situ during thermal imidization of the polyimide precursors using thin film stress analyzer (TFSA), and interpreted with respect to their morphology. According to the molecular orientation and packing order, the residual stress varied from 23.1 to 18.4 MPa, decreased with increasing chain rigidity. The thermal properties of the PI films were investigated using differential scanning calorimetry (DSC) and thermogravimetric analysis (TGA) and their optical properties were measured by ultraviolet-visible spectrophotometer (UV-vis). The properties of PI films were found to be strongly dependent upon the morphological structure.