

Solid State Polymerization of High Temperature Nylon Effect of Furandicarboxylic acid as Terephthalic acid Substituent

ENDAH YOHANA KURNIA^{1,2}, 김재훈^{1,*}

¹한국과학기술연구원;

²Univeristy of Science and Technology

(jaehoonkim@kist.re.kr*)

Furan-based co-polyamide were synthesized by two-step method : (1) a prepolymerization of nylon 4F (F based on 2,5-furandicarboxylic acid/ FDCA) and nylon 46 by melting polymerization, and (2) polymerization by solid-state polymerization using nitrogen/steam as the sweep fluid at reaction temperatures in the range of 200–240 OC. The effect of temperature, (nitrogen/steam) flow rate, particle size, and steam content of sweep fluid were investigated and then be compared with previous study about the effects of constituent ratio and thermal properties on the solid-state polymerization (SSP) of co-polyamide composed nylon 4T (T based on terephthalic acid) and nylon 46. The results show that furan-based polyamide has lower degree of polymerization compare with terephthalic-based polyamide. It is based on lower intrinsic viscosity (IV) evolution from both furan-based prepolymer and furan-based polymer than both terephthalic-based prepolymer and terephthalic-based polymer at same condition. Physical and thermal properties are investigated and the results are presented.