

Polyspiroacetals (III) - Synthesis and Characterization of Processable Rigid Polymers with Spiroacetals

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Rigid polymers have recently been attracted much interest because of their potential applications as high-performance polymers. However, they have not been realized for practical use due to the difficulties of processing resulting from insolubility and infusibility. We have synthesized a series of processable rigid aromatic polyesters with flexible side groups, which has spiroacetal moiety in the polymer backbone. These polymers were prepared by interfacial polycondensation from 2,4,8,10-tetraoxaspiro [5,5] undecane-3,9-bis-hydroxybenzene with 2,5-dialkoxysubstituted terephthaloyl chloride. The majority of these polymers were soluble in polar solvents like THF, DMF, CHCl₃ and phenol. The inherent viscosities were ranged from 0.15 to 0.30 dl/g and the initial decomposition were occurred at 286~318°C in N₂ gas atmosphere. The melting temperatures were detectable at 179 ~ 232°C, whose values decreased with increasing the length of side chains. WAXS-diffractograms showed that all of the polymers have some crystallinity at room temperature.