



XI Reunión del GEP (RSEQ RSEF)

Ciencia de Polímeros:
Retos globales-Nuevas estrategias

Valladolid

20 - 24 de septiembre de 2009



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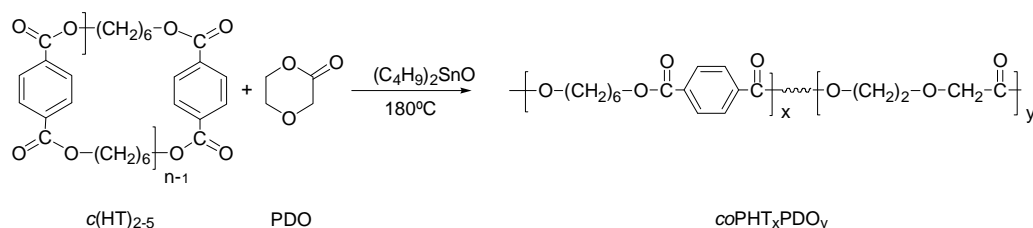
POLY(HEXAMETHYLENE TEREPHTHALATE-*CO-p*-DIOXANONE) COPOLYESTERS OBTAINED BY RING-OPENING POLYMERIZATION

G. Giammanco, A. Martínez de Ilarduya, A. Alla, S. Muñoz-Guerra

Departament d'Enginyeria Química, Universitat Politècnica de Catalunya, ETSEIB, 08028-Barcelona
E-mail: giammanco@ula.ve

Ring-opening polymerization (ROP) of cyclic aromatic oligoesters has received special attention these last years, since it represents a new interesting way for obtaining engineering thermoplastics as poly(alkylene terephthalates). Outstanding advantages offered by the ROP method are low melt viscosities, high reaction rates and the absence of condensation byproducts.¹ The method is also applicable to the copolymerization of these cyclic aromatic oligomers with other lactones making possible the preparation of new copolyesters with tailored properties. In a previous research developed in our group, copolyesters from hexamethylene terephthalate (HT) and ϵ -caprolactone were obtained by ROP in good yields and with high molecular weights.²

In this work we report the synthesis of hexamethylene terephthalate cyclic oligomers α (HT)₂₋₅ by thermal cyclodepolymerization of poly(hexamethylene terephthalate) (PHT) and their subsequent copolymerization with *p*-dioxanone (PDO), which is an aliphatic lactone that has found industrial application in the production of bioabsorbable sutures.



Ring-opening copolymerization in bulk of mixtures of α (HT)₂₋₅ and PDO using tin (IV) oxide catalyst, afforded random copolyesters displaying moderated molecular weights which decreased with their content in dioxanone. The isothermal crystallization kinetics using the Avrami method revealed that the crystallization rate decreased as the content in PDO increased in the copolyester. The thermal stability of the coPHT_xPDO_y was evaluated by TGA showing that, in contrast to the homopolymers, a two-stage mechanism operates in the thermal degradation of these copolyesters. A preliminary study made on the hydrolytic degradation of the synthesized copolyesters followed by gravimetry, NMR and GPC showed slightly enhanced degradability compared to the PHT homopolymer.

Acknowledgments. CICYT (Spain) for Grant Number MAT2006-12,209-C02 and FONACIT (Venezuela) for the Master Grant awarded to G.G.

Referencias

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2. Gonzalez-Vidal, N.; Martínez de Ilarduya, A.; Herrera, V.; Muñoz-Guerra, S. *Macromolecules*. 2008, 41, 4136-4146.