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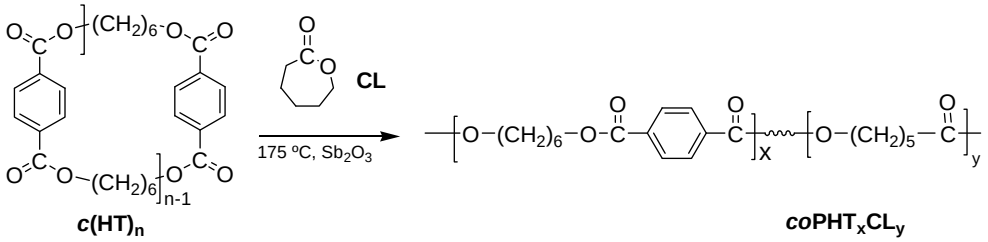
POLY(HEXAMETHYLENE TEREPHTHALATE-*co*-ε-CAPROLACTONE) COPOLYESTERS BY RING OPENING POLYMERIZATION: INFLUENCE OF THE OLIGOTEREPHTHALATE CYCLE SIZE

Nathalie González, Antxon Martínez de Ilarduya, Abdelilah Alla and Sebastián Muñoz-Guerra

Departament d'Enginyeria Química, Universitat Politècnica de Catalunya, ETSEIB, Diagonal 647, 08028 Barcelona
E-mail: abdel.alla@upc.edu

The synthesis of aromatic polyesters by ring-opening polymerization (ROP) of cyclic esters has received considerable attention in the last few years and started to be considered a serious alternative to the traditional polycondensation method for the preparation of the most-extensively used polyesters such as poly(alkylene terephthalate)s and poly(alkylene isophthalate)s.[1]

In this work we describe the synthesis of a series of poly(hexamethylene terephthalate-*co*-caprolactone) *co*PHT_xCL_y by ROP using either a fraction enriched in hexamethylene terephthalate dimers *c*$(HT)_2$ or one enriched in hexa-heptamers *c*$(HT)_{6\text{-}7}$. The cyclic oligomers *c*$(HT)_n$ were prepared previously by cyclodepolymerization reaction of poly(hexamethylene terephthalate) (PHT) which was obtained by bulk polycondensation of dimethyl terephthalate and 1,6-hexanediol. The cyclic oligomer fractions were obtained by selective precipitation with the appropriate solvent. All the cyclic compounds were characterized by MALDI-TOF, HPLC and NMR, as previously described.[2]



No significant differences in structure and thermal properties were found between the copolyesters made from *c*$(HT)_2$ and those made from *c*$(HT)_{6\text{-}7}$ at long reaction times. However, the analysis of the products generated at the earlier stages of the polymerization revealed that the reaction rate was lower when *c*$(HT)_2$ were used, and that the microstructure of the resulting copolyesters was more statistical in this case.

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