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POLY(HEXAMETHYLENE TEREPTHALATE-co-CAPROLACTONE) COPOLYESTERS BY RING OPENING POLYMERIZATION: INFLUENCE OF THE OLIGOTEREPTHALATE CYCLE SIZE

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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) coPHTxCLy by ROP using either a fraction enriched in hexamethylene terephthalate dimers c(HT)2 or one enriched in hexa-heptamers c(HT)6-7. 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)6-7 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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