ε-Decalactone: a thermoresilient and toughening comonomer to poly(L-lactide)

*Peter Olsén, Tina Borke, Karin Odelius, and Ann-Christine Albertsson**

Department of Fibre and Polymer Technology, KTH Royal Institute of Technology, SE-100 44, Stockholm, Sweden

*Corresponding author:aila@polymer.kth.se

Tel. +46-8-790 82 74 Fax: +46-8-20 84 77

Supporting Information

Figure S1.

Conversion as a function of reaction time for the bulk copolymerization of DL (□) and LA (■) at 110 °C with [DL]/[LA] ≈ 1, [DL+LA]/[$Sn(Oct)_2$] ≈ 200 and $M_{n,theory}$ ≈ 30,000 g/mol measured by ^{1}H-NMR.

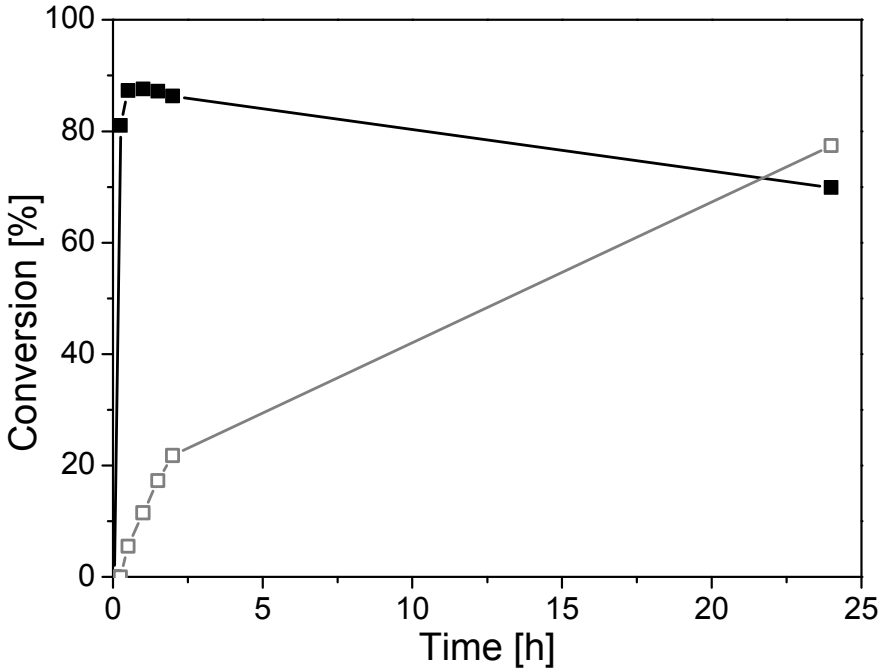

Figure S2.

Mol fractions of DL (□) and LA (■) incorporated into the polymer with time, determined by ^{1}H-NMR. LA polymerizes first and reaches its highest conversion after 30 min. DL- units are subsequently incorporated by transesterification

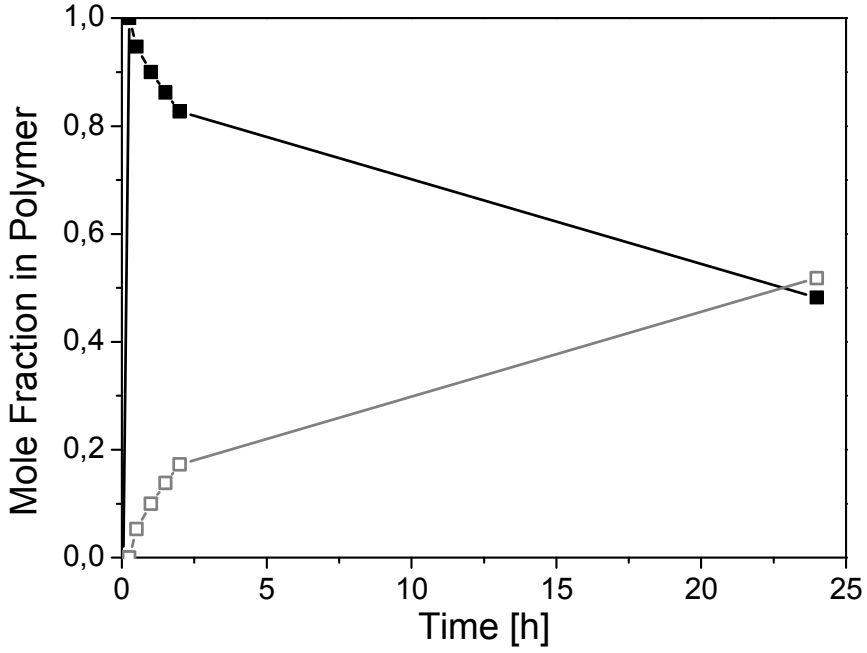

Figure S3.

^{13}C-NMR spectrum of PDL polymerized with $Sn(Oct)_2$/benzyl alcohol for 134 h at 110 °C. The inset shows the structure of PDL with assignment of the signals.

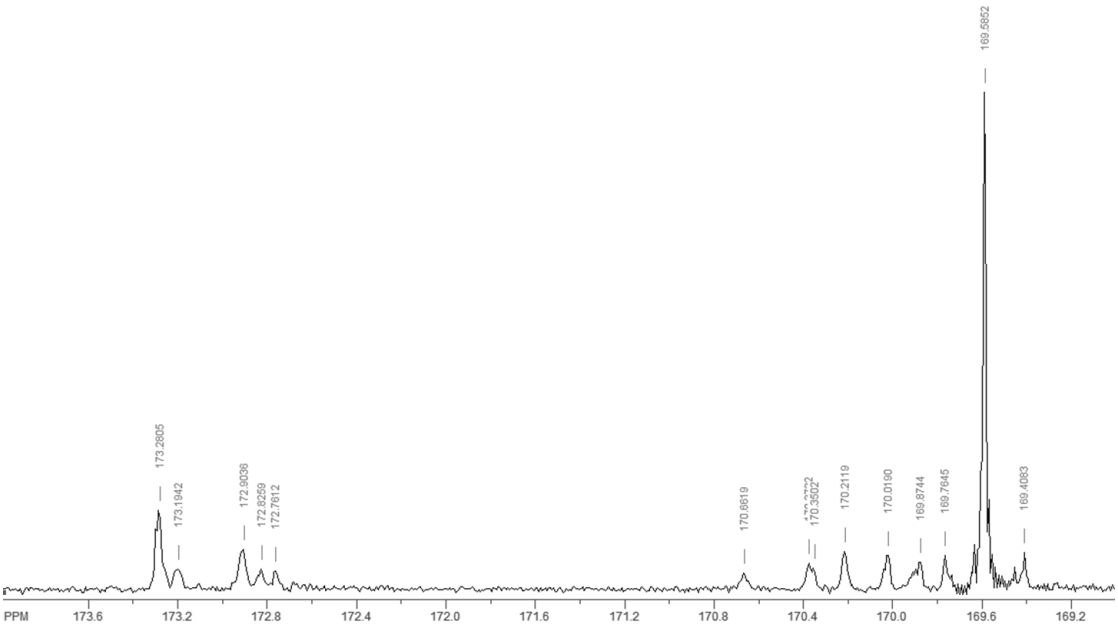

Figure S4.

Detail of the ^{13}C-NMR spectrum of a random PLA/PDL-copolymer showing the carbonyl region. The peaks at 169.6 ppm and 173.3 ppm belong to PLA- and PDL-homopolymer blocks, respectively. The other signals originate from a randomized structure that is a consequence of transesterification reactions.

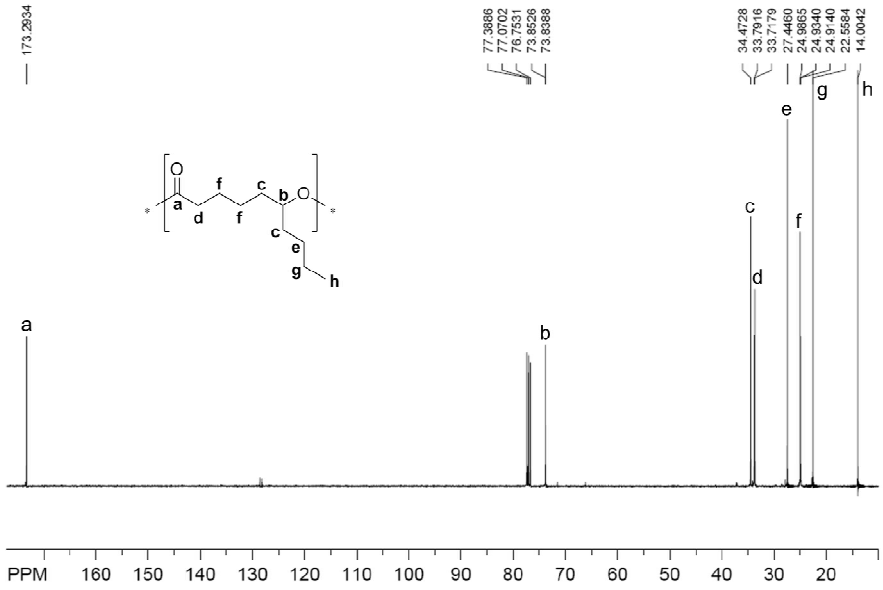

Figure S5

^{1}H-NMR spectra of (I.) a random PLA/PDL copolymer and (II.) a block copolymer showing different signals and peak pattern according to the neighboring monomer units