

**Study on synthesis of GMA-terminated PLLA and
its thermal/mechanical properties**

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In this study, glycidyl methacrylate-terminated poly(L-lactide) (GMA-PLLA) with an improved thermal and mechanical properties was synthesized for packaging and construction materials. The synthesis of GMA-PLLA was performed by two steps as follows:

First, PLLA was synthesized by using 50 g of L-lactide, 0.1 wt% initiator (1-dodecanol), and 0.5 wt% catalyst of [tin(II)-bis-2-ethylhexanoate{Sn(Oct)₂}] at 140°C. Its number average molecular weight (M_n) and melting temperature (T_m) were about 193,000 g/mol and 180 °C, respectively. Second, GMA-PLLA was obtained by polymerization of 50 g-PPLA, 11 g- GMA and 0.1~0.3 wt% zinc catalyst. The value of tanδ was 0.740 at 82 °C, which was the lowest. The synthesized GMA-PLLA had number average molecular weight of 43,000 g/mol and melting temperature of 193 °C. In conclusion, it was found that GMA-terminated PLLA was higher than PLLA in thermal and mechanical properties. It could be used for packaging and construction materials.