Supplementary Data

1. Coordination-insertion mechanism of l-lactide ring-opening polymerization using liquid Sn(O*n*R)$_2$ as an initiator

From the kinetic investigations by using non-isothermal DSC methods, the proposed coordination-insertion mechanism of the ring-opening polymerization in bulk using liquid tin(II) *n*-alkoxides (Sn(O*n*R)$_2$) can be shown in Fig. 1.

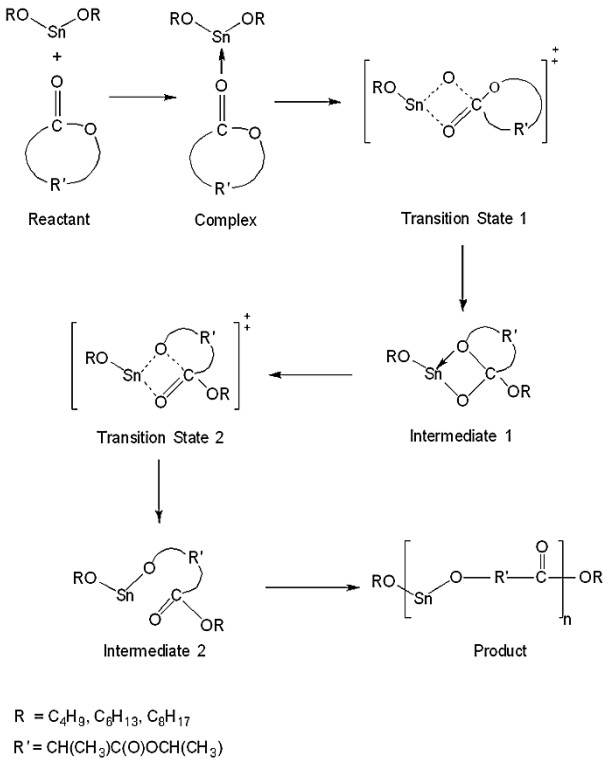


Fig. 1 Coordination-insertion proposed mechanism for the ring-opening polymerization (ROP) in bulk of l-lactide cyclic ester monomer initiated by liquid tin(II) *n*-alkoxides.

2. Characterization of poly(l-lactide) using liquid tin(II) *n*-butoxide as an initiator

2.1. Qualitative structural characterization by FTIR

Fig. 2 shows a typical FTIR spectrum of one of the purified poly(l-lactide) products and the major vibrational peak assignments are listed in Table 1.

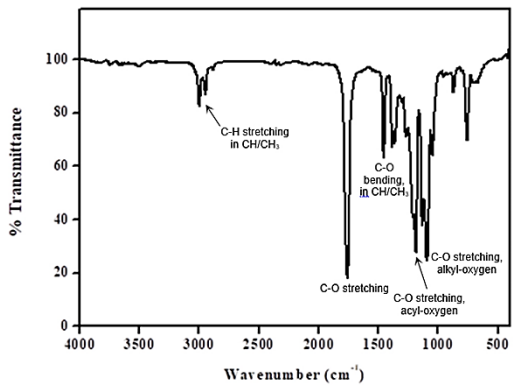
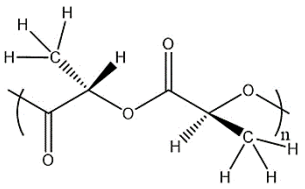


Fig. 2 FTIR spectrum of purified poly(l-lactide) synthesized by using 0.1 mol% liquid Sn(O*n*C$_4$H$_9$)$_2$ as an initiator at 120 °C for 24 h.

Table 1 FTIR major vibrational peak assignments for purified poly(l-lactide) synthesized by using 0.1 mol% liquid $Sn(OnC_4H_9)_2$ as an initiator at 120 °C for 24 h.

Vibrational assignments	Band intensity*	Wavenumber (cm^{-1})
C-H stretching, in CH/CH_3	m	2997, 2946
C-O bending	s	1758
C-H bending, in CH/CH_3	s	1454, 1383
C-O stretching, acyl-oxygen	s	1267
C-O stretching, alkyl-oxygen	s	1096

*w = weak, m = medium, s = strong



Poly(l-lactide), PLLA

2.2. Microstructural characterization by ^{1}H-NMR

A typical ^{1}H-NMR spectrum of a poly(l-lactide) in deuterated chloroform solution at room temperature including the peak assignments for the various protons of polymer structure were shown in Fig. 3 and the chemical shifts of the various peaks are given in Table 2.

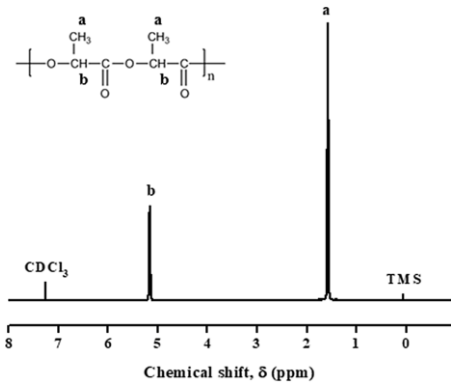


Fig. 3 400 MHz ^{1}H-NMR spectrum of purified poly(l-lactide) synthesised by using 0.1 mol% liquid tin(II) *n*-butoxide ($Sn(OnC_4H_9)_2$) as an initiator at 120 °C for 24 h.

Table 2 Proton assignments and chemical shifts (δ, ppm) of the ^{1}H-NMR spectrum of poly(l-lactide) synthesized by using 0.1 mol% liquid $Sn(OnC_4H_9)_2$ as an initiator at 120 °C for 24 h.

Proton assignments	Peak multiplicity	Chemical shift (δ, ppm)
a	doublet	1.59
b	quartet	5.06