Sample Name: **Polylactide**

Sample #: **P3937-LA (L-Form)**

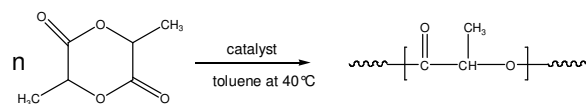**Structure:**

O   CH₃
~~~⌈ ‖   ⌉~~~
   | C — CH — O |
   ⌊   ⌋

Composition:

$M_n \times 10^3$	PDI
4.7	1.09

Synthesis Procedure:

The polymerization of (3S)-cis 3, 6-dimethyl-1,4-dioxane-2,5-dione was initiated with an aluminum-based catalyst and the reaction was carried out in apolar solvent.

n [structure] —catalyst→ / toluene at 40 ℃ ~~~[structure]~~~

Purification:

Catalyst residues were removed by repeated extraction with an aqueous EDTA solution (0.1 mol L⁻¹) and the polymeric solution was then washed with water up to neutral pH. Toluene was removed under reduced pressure and the polymer was precipitated employing a large excess of hexane. The polymer was further dissolved in benzene and filtered followed by freeze drying.
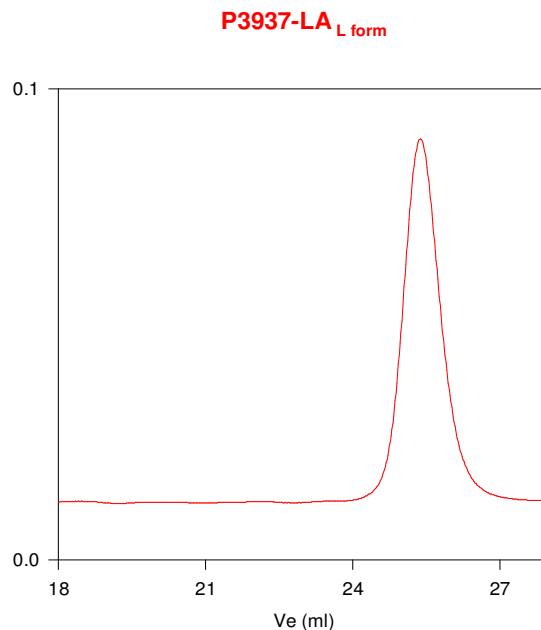
Characterization:

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography.

Solubility:

Polylactide is soluble in toluene, THF, $CHCl_3$ and CH_2Cl_2. The polymer is insoluble in methanol, hexane and ether.

SEC of Homopolymer:

P3937-LA $_{L\ form}$

Size exclusion chromatograph of poly(L–lactide):

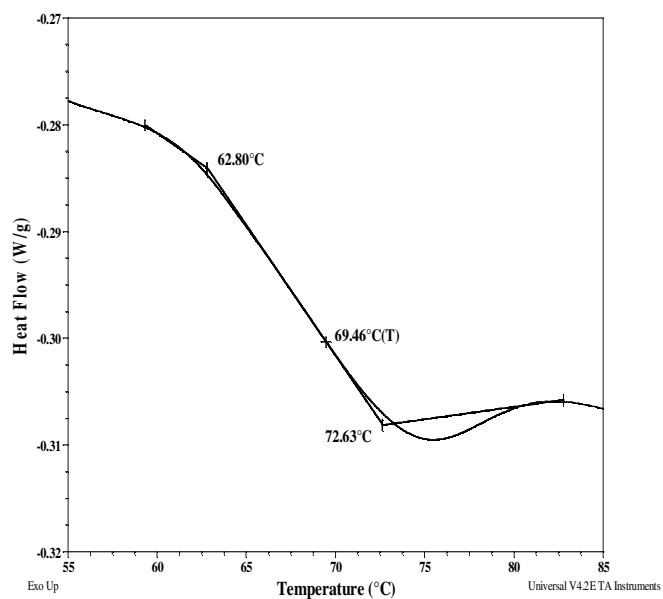M_n=4700, M_w=5100, PI=1.09

Thermal analysis of the sample P3937-LA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Thermal analysis results at a glance

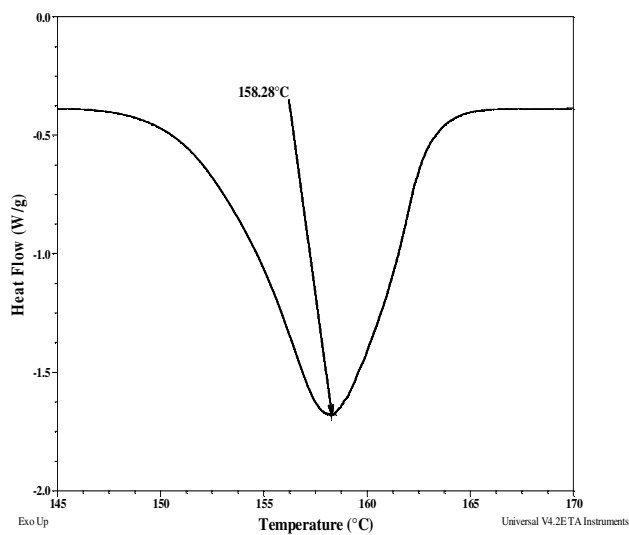| T_m (°C)	T_c (°C)	T_g (°C)
158	112	69

Thermogram for the sample

Melting and crystallization curves

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

Melting curve for the LA sample:

Crystallization curve: