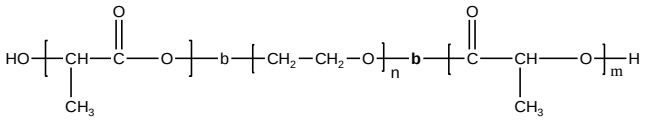
Sample Name:
Poly(lactide -b- ethylene oxide -b- lactide) (DL form)

Sample #: P8468-LAEOLA (DL form)

Structure:

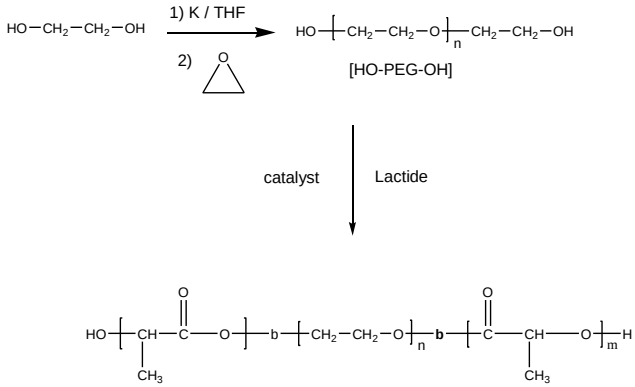


Composition:

Mn x 10^3	PDI
1.0-b-8.0-b-1.0	1.06

Synthesis Procedure:

Poly(lactide -b- ethylene oxide -b- lactide) was prepared by of living anionic polymerization of ethylene oxide(EO) followed by living coordination polymerization of D,L-lactide(LA) using tin catalyst. The scheme of the reaction is illustrated below:



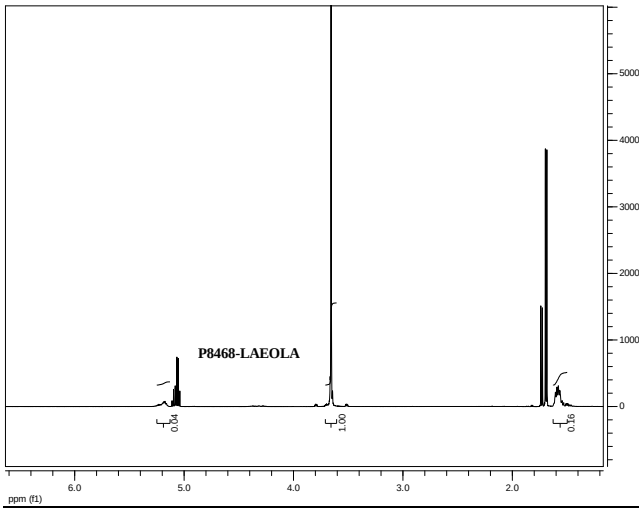
Characterization:

The molecular weight and polydispersity index of the poly(ethylene oxide) block was determined by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. The composition of the lactide ABA triblock copolymer was determined using ^{1}H-NMR spectroscopy by comparing the integration of the lactide peaks (5.2ppm) with that of the ethylene oxide peaks (3.6ppm).

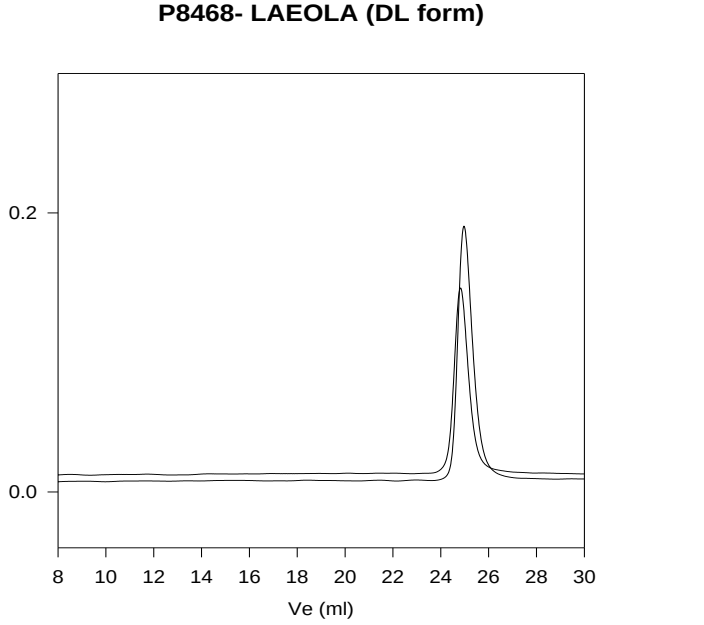
Solubility:

The polymer is soluble in THF, chloroform, DMF and toluene, but not soluble in hexane.

NMR of Sample:



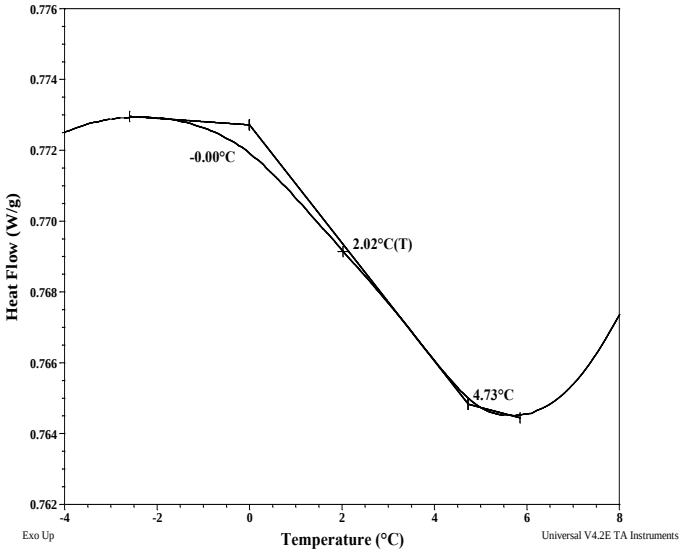
SEC of Sample:



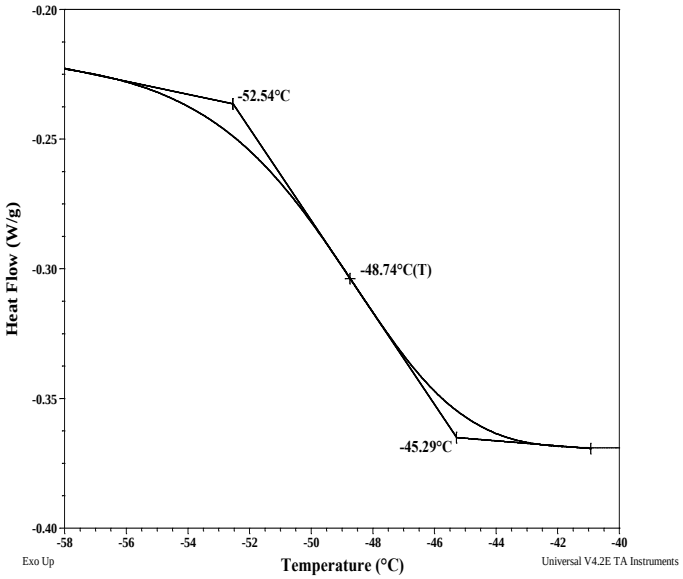
Thermal analysis of the sample# P8468-LAEOLA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°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).

Thermogram for PLA block:



For PEO block



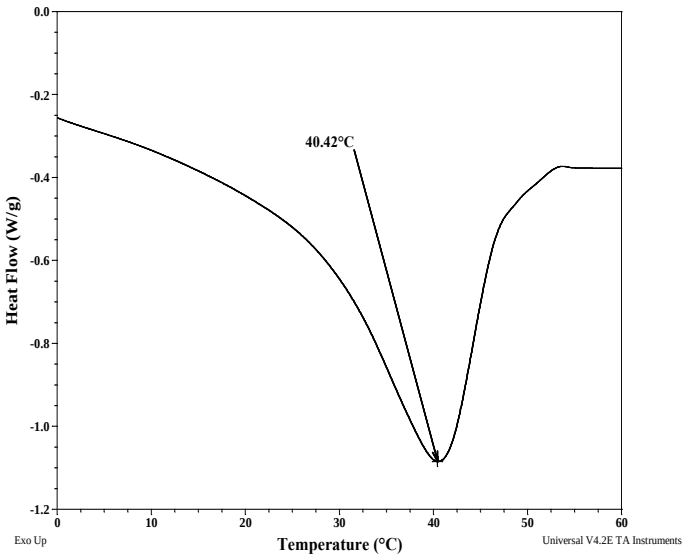
Thermal analysis results at a glance

For PLA block (DL)		
T_g: 02°C	T_m: -	T_c: -
For PEO block		
T_g: -49°C	T_m: 40°C	T_c: -24°C

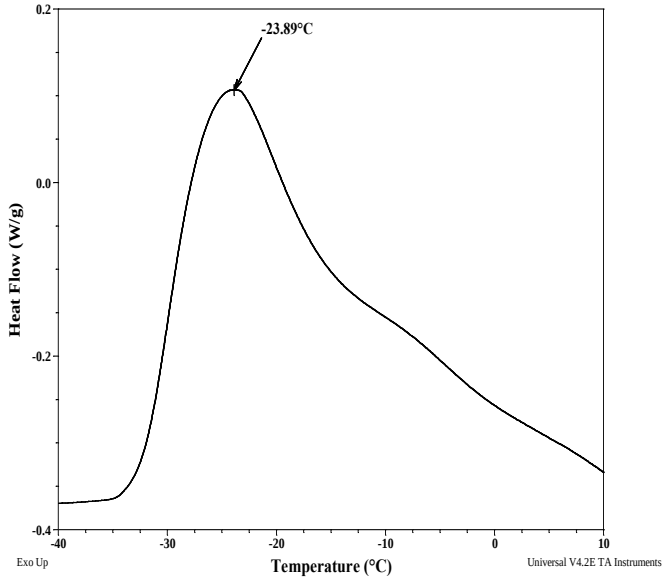
Melting and crystallization curve for the sample

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 PEO block



Crystallization curve For PEO block


-23.89°C
0.2
0.0
-0.2
-0.4
Heat Flow (W/g)
-40
-30
-20
-10
0
10
Temperature (°C)
Exo Up
Universal V4.2E TA Instruments