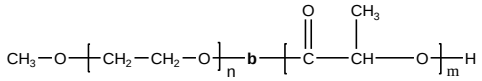
Sample Name:
Poly(ethylene oxide -b- lactide) (DL form)

Sample #: P6533-EOLA (DL form)

Structure:

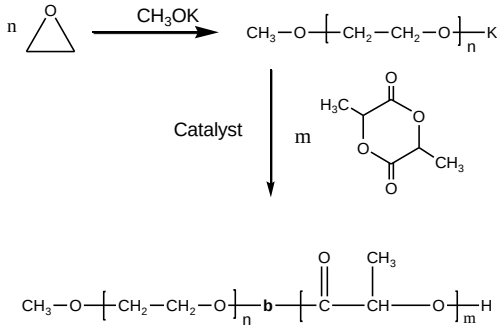


Composition:

Mn x 10^3 PEO-b-PLA	PDI
10.0-b-1.2	1.08

Synthesis Procedure:

Poly(ethylene oxide -b- lactide) is prepared by living anionic polymerization of ethylene oxide and coordination polymerization of lactide with Tin octoate as catalyst. The scheme of the reaction is illustrated below:



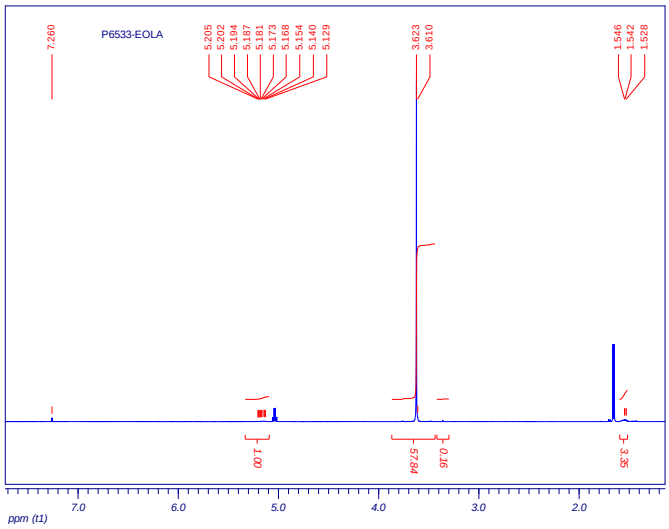
Characterization:

An aliquot of the anionic poly(ethylene oxide) block was terminated before addition of lactide and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the methoxyl protons of poly(ethylene oxide) at about 3.6 ppm with the polylactide protons at about 5.1 and 1.55 ppm.

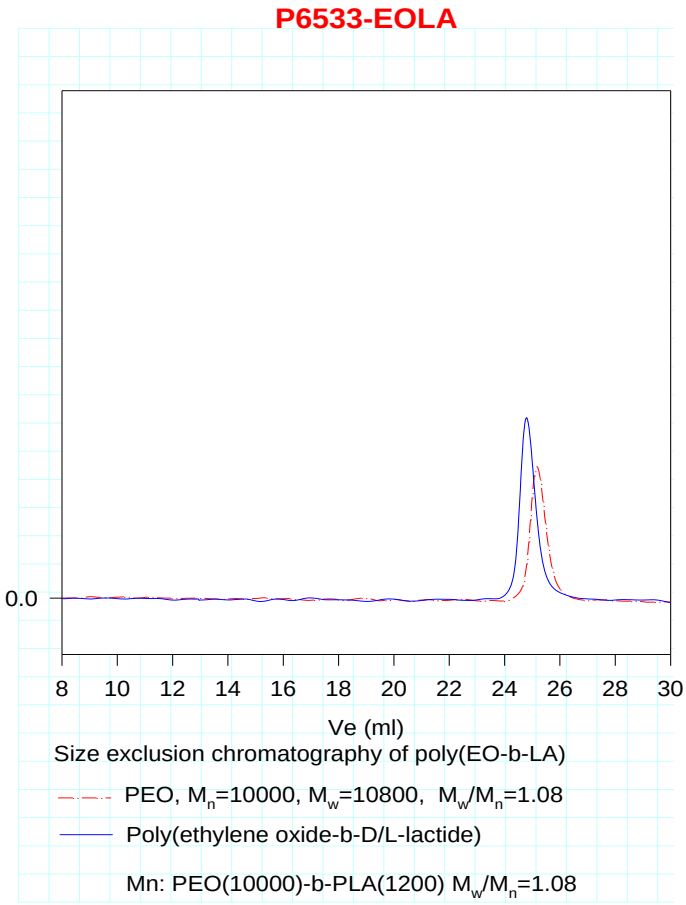
Solubility:

The polymer is soluble in $CHCl_3$, THF, DMF, toluene and precipitates from ethanol, ether and hexane.

^{1}H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:



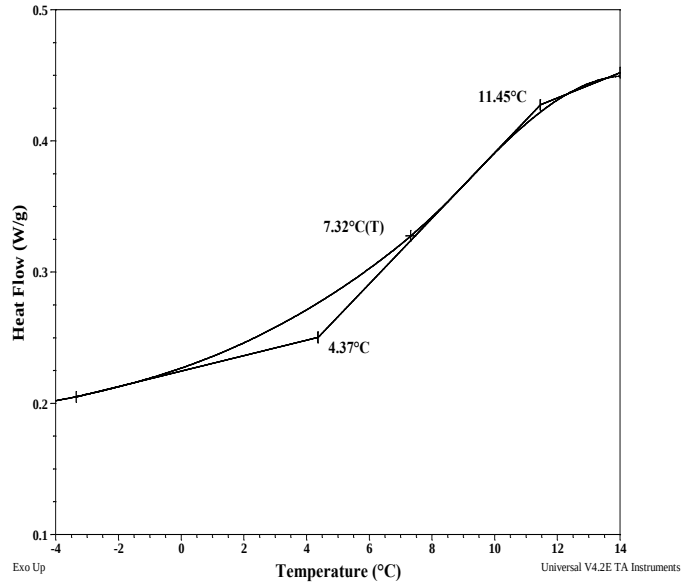
Thermal analysis of the sample# P6533-EOLA

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 cooling scan was considered as the glass transition temperature (T_g).

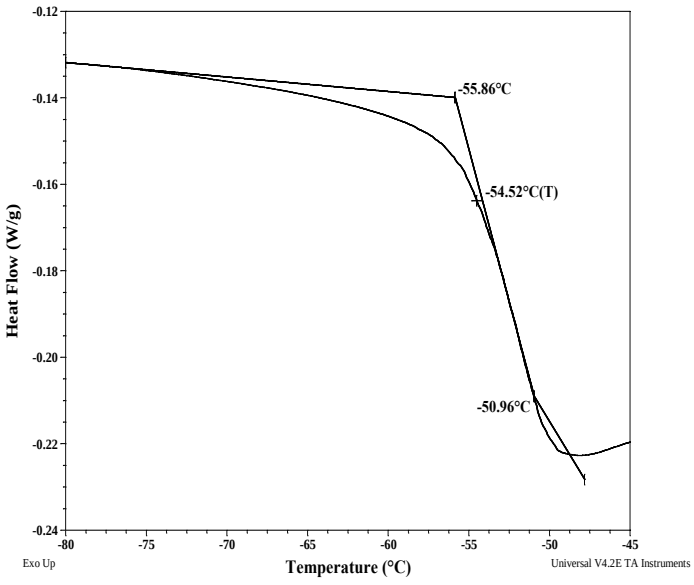
Thermal analysis results at a glance

For PLA block (DL)		
T_g: 07°C	T_m: -	T_c: -
For PEO block		
T_g: -55°C	T_m: 47°C	T_c: 30°C

DSC thermogram for PLA block:



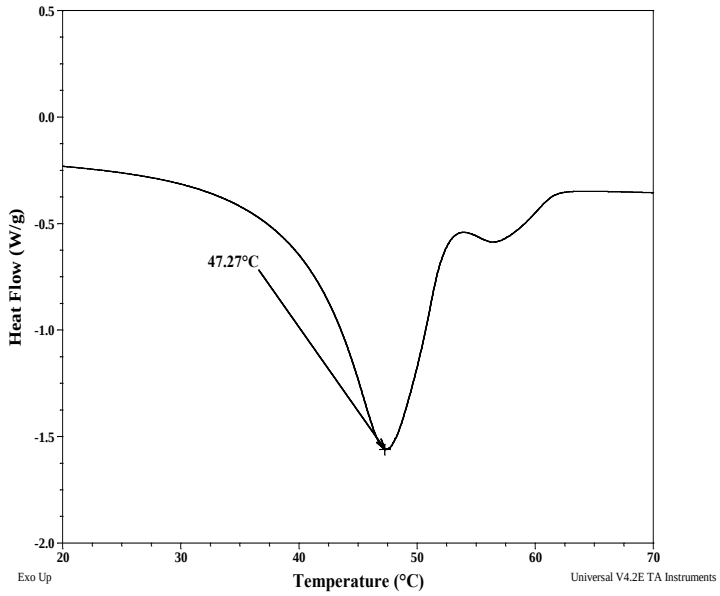
DSC thermogram for PEO block:



Melting and crystallization curve for PEO block:

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. Both peaks were recorded during the 2nd heating cycle.

Melting curve



Crystallization curve