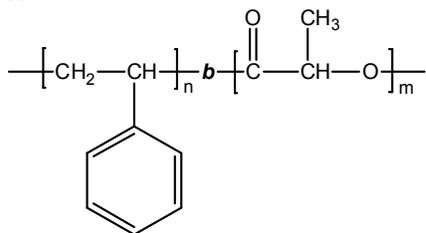


Sample Name: Poly(styrene-b-lactide)

Sample #: P6511-SLA (LA is L form)

Structure:

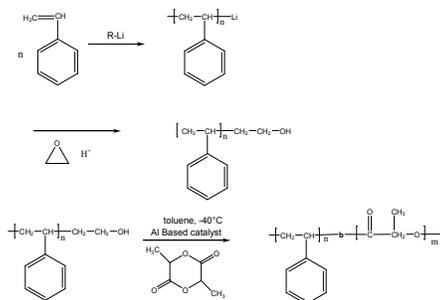


Composition:

$M_n \times 10^3$ S-b-LA	Mw/Mn (PDI)
21.0-b-17.0	1.15

Synthesis Procedure:

Poly(styrene-b-lactide) is prepared by living anionic polymerization in sequential addition of styrene followed by lactide monomer or by taking the OH end functionalized polystyrene and using co-ordination polymerization process. The scheme of the reaction is illustrated below:



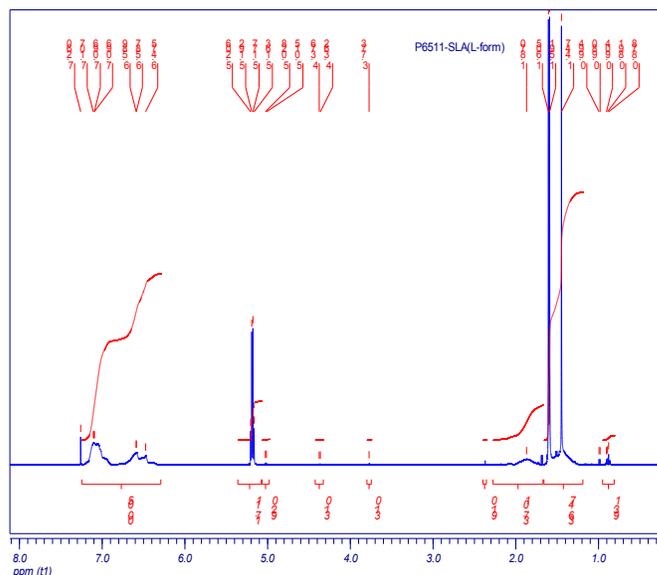
Characterization:

The block polymer was analyzed by size exclusion chromatography (SEC) to estimate the molecular weight and polydispersity index (PDI). Further, the copolymer composition was calculated from $^1\text{H-NMR}$ spectroscopy by comparing the peak area of the polystyrene protons at about 6.3-7.2 ppm with the lactide protons at 5.2 ppm. Copolymer PDI was determined by SEC.

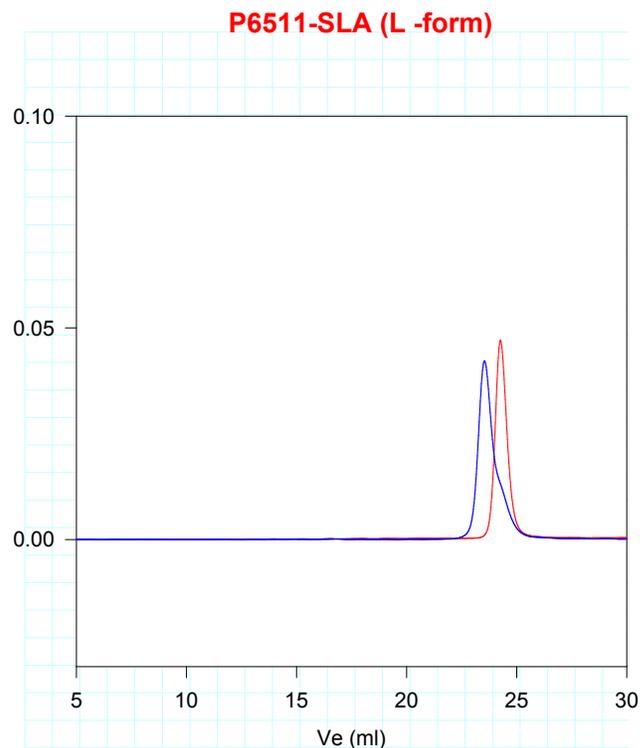
Solubility:

Poly(styrene-b-lactide) is soluble in chloroform, THF, and toluene.

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



SEC of Sample of the block copolymer:



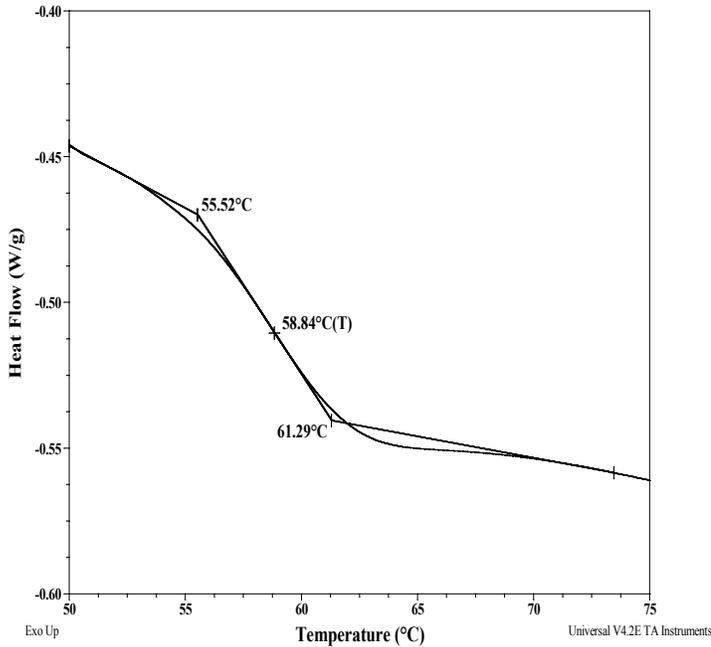
Size Exclusion chromatography of poly (styrene-b- L -lactide):

- Polystyrene, $M_n=21000$, $M_w=22000$, $PI=1.04$
- Block Copolymer: PS(21000)-b-PLA(17000), $PI=1.15$
Composition from H NMR

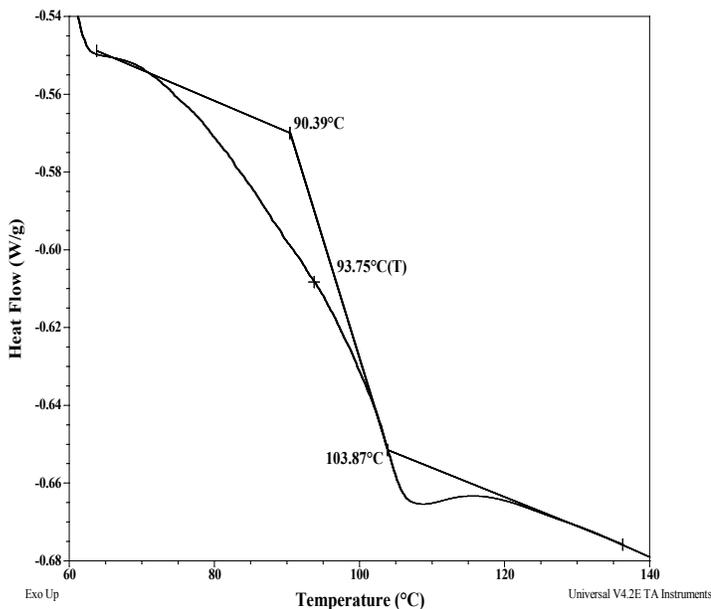
Thermal analysis of the sample# P6511-SLA

Thermal analysis of the block polymer 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).

Thermogram for PLA block:



For PS block



Thermal analysis results at a glance

For PLA block

T_g : 59°C

T_m : 162°C

T_c : Not observed

For PS block

T_g : 94°C

Melting curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak during heating of the sample from 20°C to 200°C at heating rate of 10°C/min.

Melting curve for PLA block

