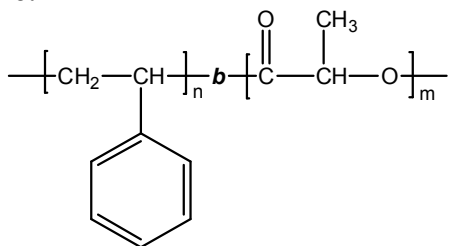


## Sample Name: Poly(styrene-b-lactide)

## Sample #: P6513-SLA (LA is L form)

### Structure:

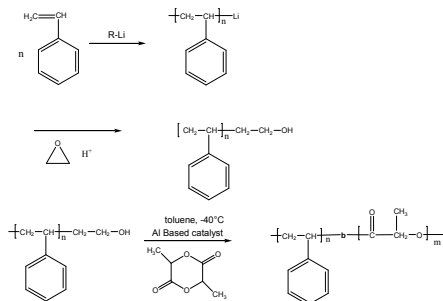


### Composition:

| Mn x 10 <sup>3</sup><br>S-b-LA | Mw/Mn (PDI) |
|--------------------------------|-------------|
| 21.0-b-24.3                    | 1.14        |

### 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:



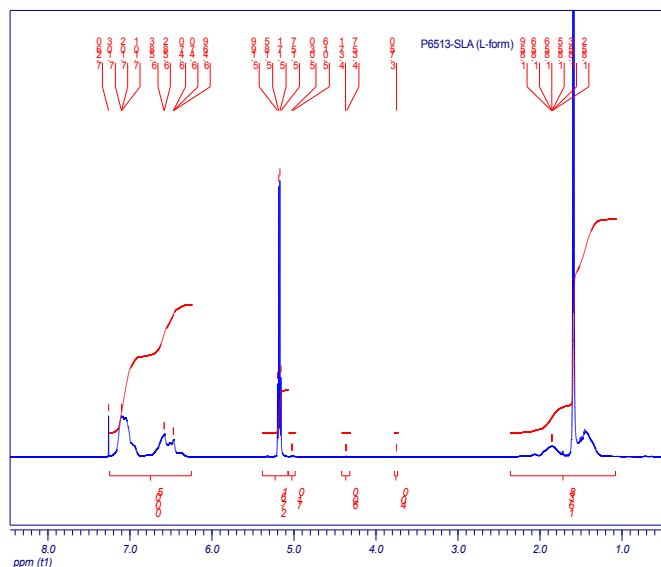
### Characterization:

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 <sup>1</sup>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.

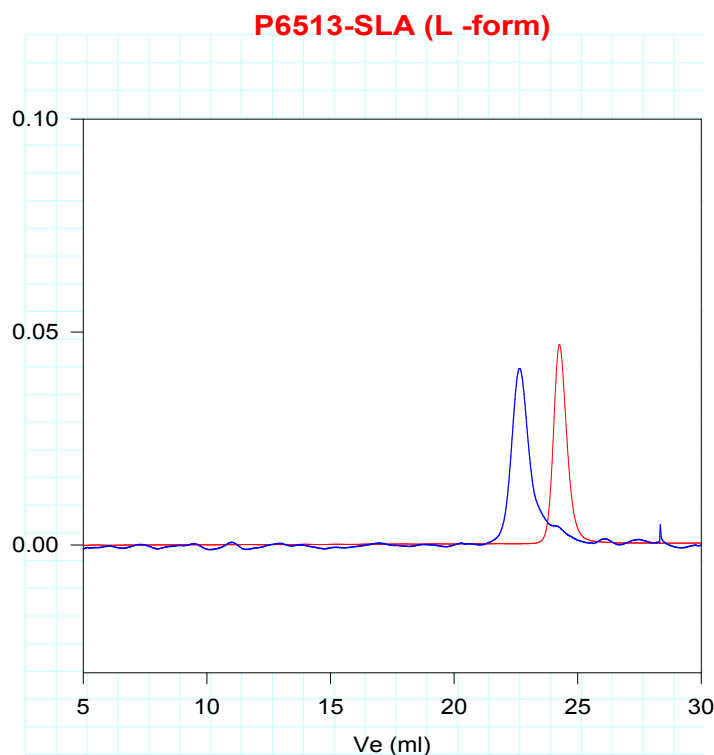
### Solubility:

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

### <sup>1</sup>H-NMR Spectrum of the block copolymer:



### SEC of Sample of the block copolymer:



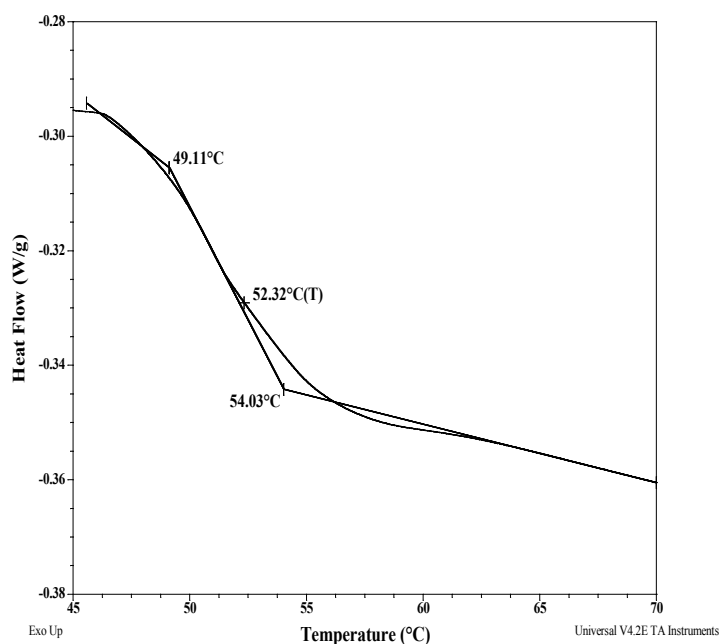
Size Exclusion chromatography of poly (styrene-b- L -lactide):

- Polystyrene, M<sub>n</sub>=21000, M<sub>w</sub>=22000, PI=1.04
  - Block Copolymer: PS(21000)-b-PLA(24300), PI=1.14
- Composition from H NMR

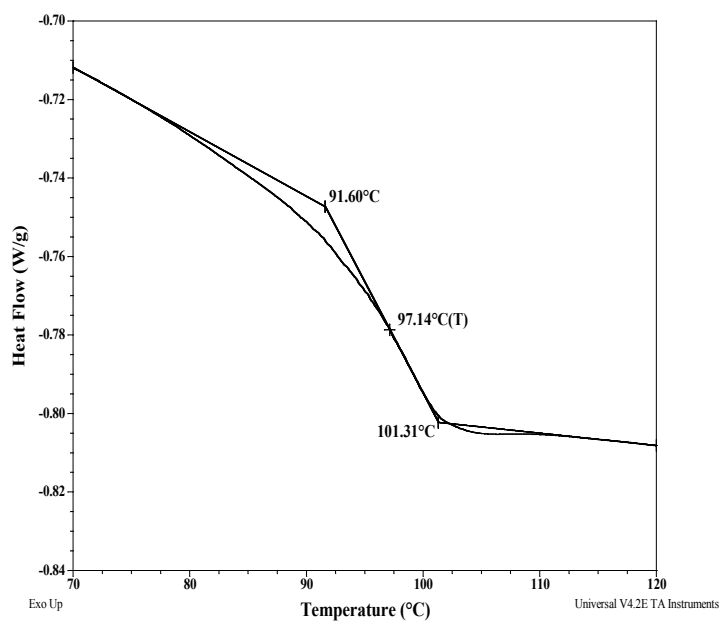
## Thermal analysis of the sample# P6513-SLA

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

|              |               |                      |
|--------------|---------------|----------------------|
| $T_g$ : 52°C | $T_m$ : 172°C | $T_c$ : Not observed |
| For PS block |               |                      |
|              | $T_g$ : 97°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

