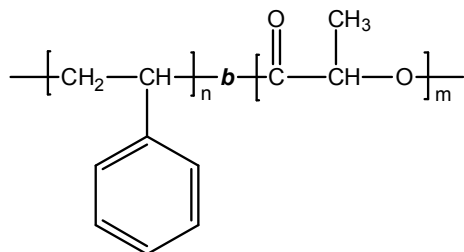## Sample Name: Poly(styrene-b-lactide)

Sample #: P8878-SLA (LA is L form)

Structure:
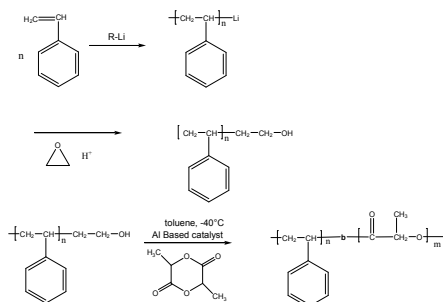

Composition:

Mn x 10^3 S-b-LA	Mw/Mn (PDI)
19.5-b-4.5	1.10

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}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.
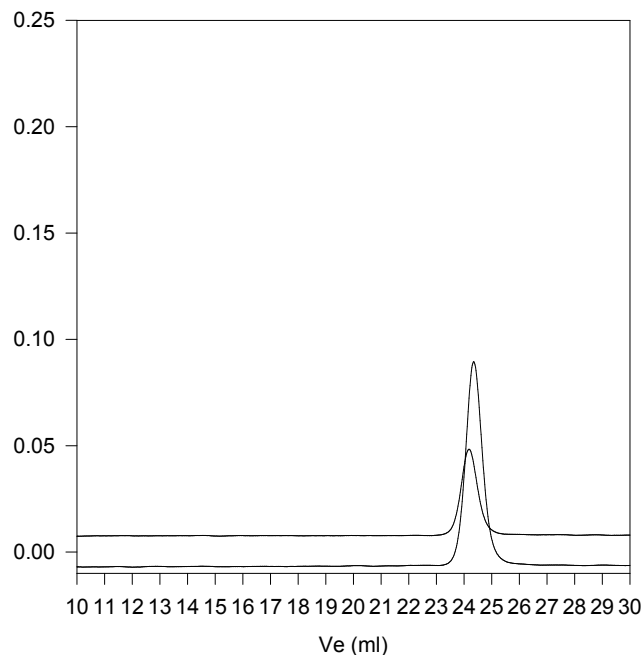
Solubility:

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

^{1}H-NMR Spectrum of the block copolymer:
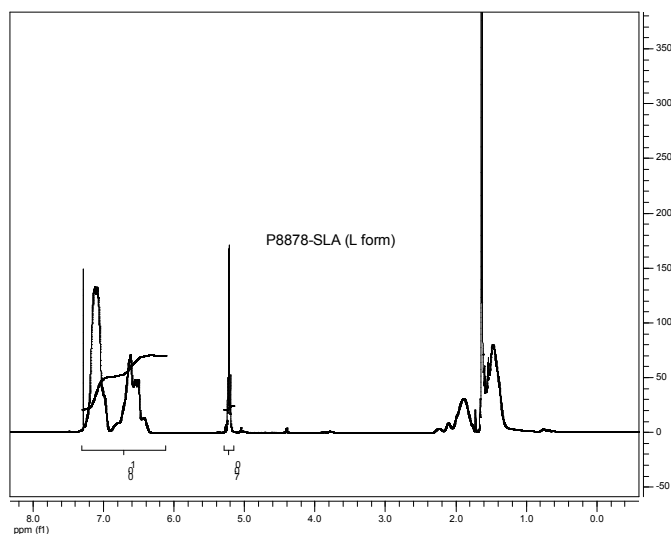
P8878-SLA (L form)

SEC of Sample of the block copolymer:
### P8878-SLA (L-form)

Ve (ml)

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

—— Polystyrene, M_n=19500, M_w=20,400, PI=1.06

—— Block Copolymer from Light scattering
PS(19500)-b-LA(4500), PI=1.10 Composition from H NMR

Thermal analysis of the sample# P8878-SLA

Thermal analysis of the block polymer was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^{o}C/min$. 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:
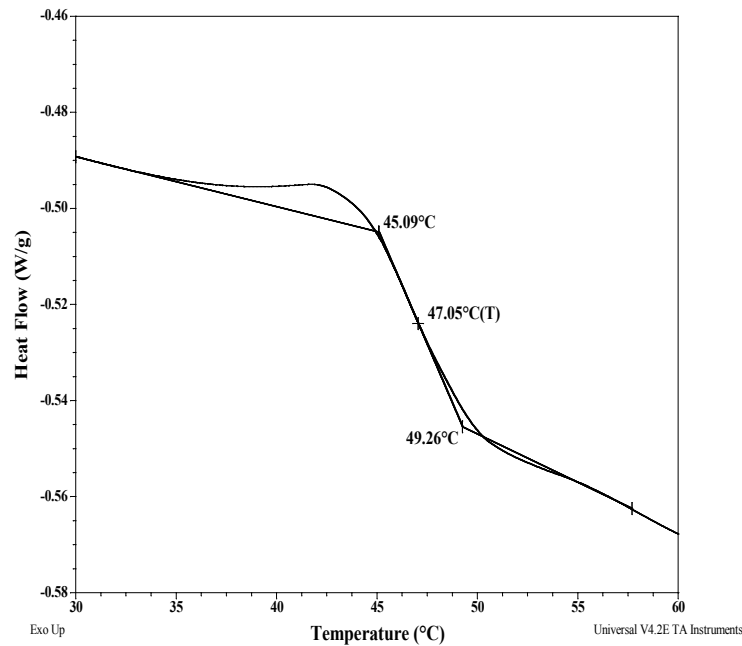
For PS block
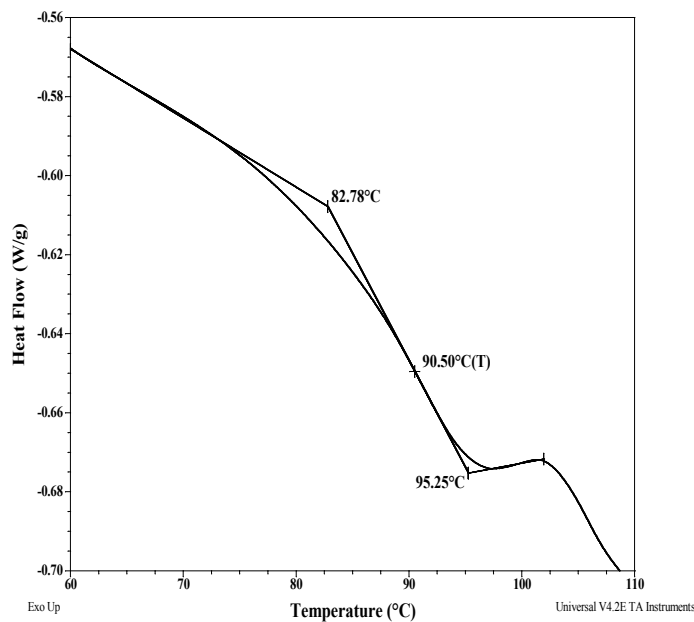
Thermal analysis results at a glance

For PLA block		
T_g: $47^{o}C$	T_m: $165^{o}C$	T_c: Not observed
For PS block		
	T_g: $91^{o}C$	

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 $20^{o}C$ to $200^{o}C$ at heating rate of $10^{o}C/min$.

Melting curve for PLA block