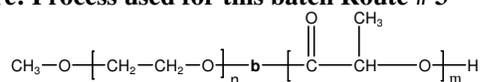


**Sample Name: Poly(ethylene oxide -b- lactide) (DL form)**

**Sample #: P40014-EOLA (DL form)**

**Structure: Process used for this batch Route # 3**



**Composition:**

|                                   |      |
|-----------------------------------|------|
| Mn x 10 <sup>3</sup><br>PEO-b-PLA | PDI  |
| 5.0-b-5.5                         | 1.13 |

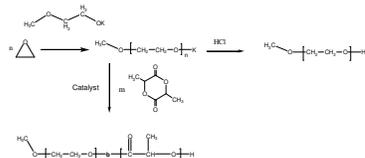
|                              |       |
|------------------------------|-------|
| T <sub>g</sub> for PLA block | 40°C  |
| T <sub>g</sub> for PEO block | -63°C |

**Synthesis Procedure:**

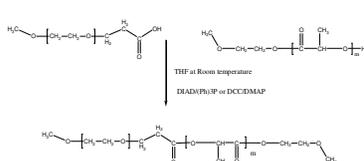
Poly(ethylene oxide-b-lactide) Can be synthesized by following routes:

**Synthetic Routes**

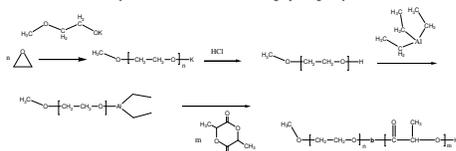
# 1. By anionic and ring opening Polymerization



# 2. By Modification of End groups and Condensation reaction



# 3. By anionic and Co-ordination ring opening Polymerization



**Characterization:**

Polymer analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the methoxyl protons of poly(ethylene oxide) at about a 3.6 ppm with the polylactide protons at about 5.1 and 1.55 ppm.

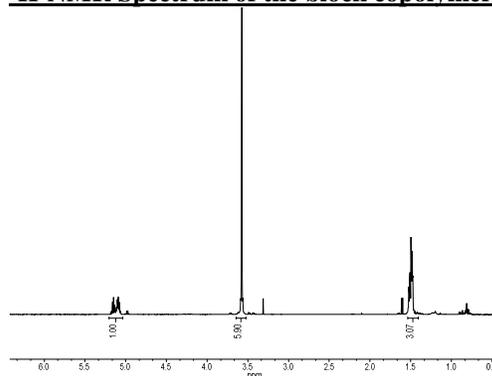
**Thermal analysis**

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<sub>g</sub>).

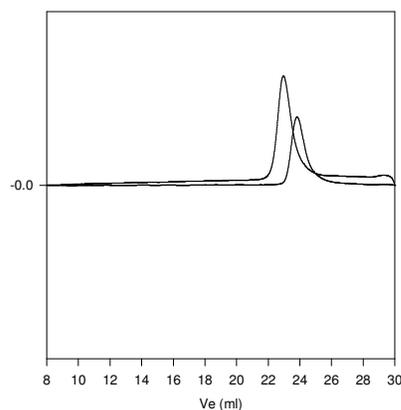
**Solubility:**

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

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

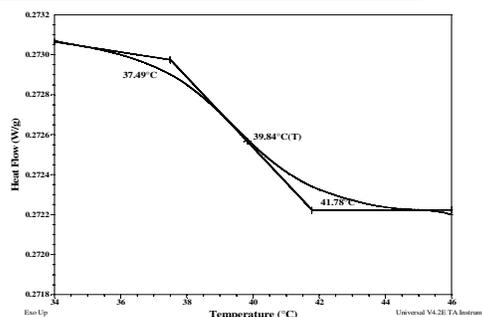


**SEC elugram of the polymer:  
P40014- EOLA (DL form)**



Size exclusion chromatography:  
 — Poly(ethylene glycol), M<sub>n</sub>=5000, M<sub>w</sub>=5200, PI=1.05  
 — Block Copolymer PEO(5000)-b-PLA(5,500), PI=1.13  
 Composition from <sup>1</sup>H NMR  
 Dp: EO(114 units)-b-LA (76 units)

**DSC thermogram for the PLA block:**



**DSC thermogram for PEO block:**

