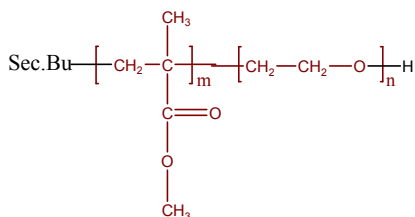


**Sample Name:**

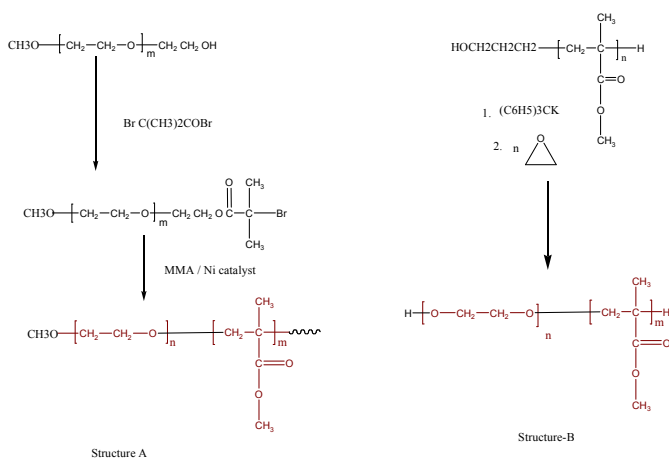
Poly(methyl methacrylate -b- ethylene oxide)

**Sample #: P11126A-EOMMA****Structure:** This has structure A**Composition:**

Mn x 10 <sup>3</sup> PEO-b-MMA	PDI
11.0-b-63.0	1.6

**Synthesis Procedure:**

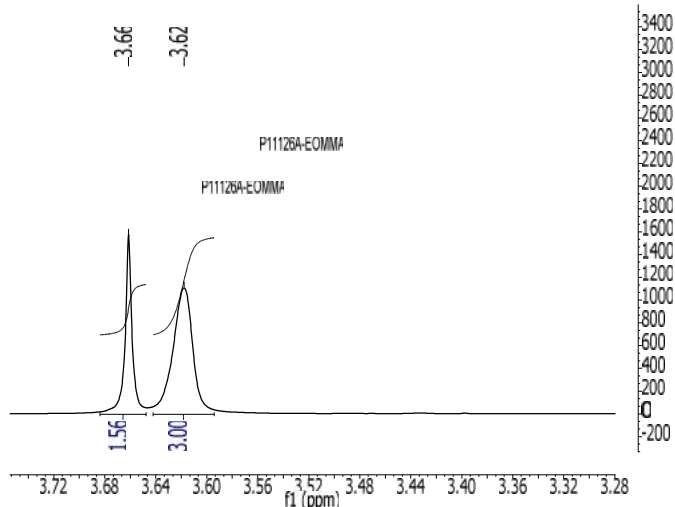
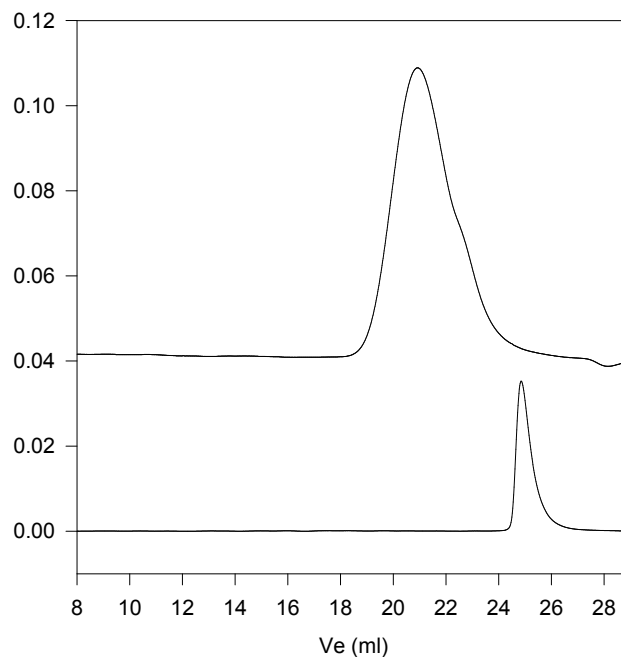
Poly(methyl methacrylate -b- ethylene oxide) is prepared by different routes. The scheme of the reactions are illustrated below:

**Purification of the polymer:**

The non-reacting PEG from the synthesized polymer can be removed by stirring the polymer in hot water. The obtained polymer dissolved in CHCl<sub>3</sub>/toluene and pass through the column packed with silica bed. The di-block copolymer obtained through second route where the macro-initiator with Br terminal group was used to initiate polymerization of the MMA. The obtained polymer solution in toluene/CHCl<sub>3</sub> was passed through a column packed with silica to remove the traces amount of Nickel catalyst. The polymer was further purified by stirring in hot water to remove un-reacted PEG macro-initiator and finally recovered by precipitation in cold ether/hexane mixture.

**Characterization:****Solubility:**

Poly(ethylene oxide -b- MMA) is soluble in CHCl<sub>3</sub>, THF, toluene. The polymer precipitated out from hexane.

**<sup>1</sup>H-NMR Spectrum of the block copolymer:****SEC of the block copolymer:****P11126A-EOMMA**

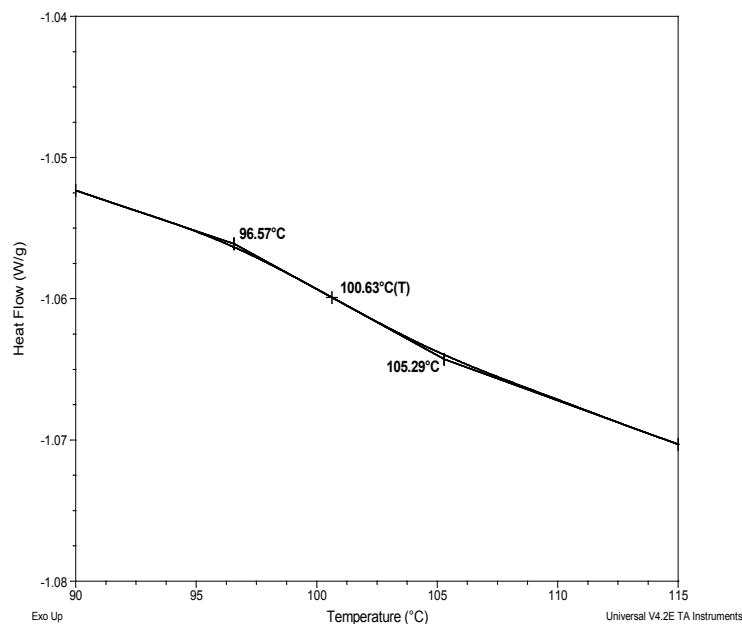
Size exclusion chromatography of poly(EO-b-MMA)

- PEO-Br M<sub>n</sub>=11,000, M<sub>w</sub>=12,000, M<sub>w</sub>/M<sub>n</sub>=1.10
- Poly(ethylene glycol-b-Methylmethacrylate)  
Mn: PEO(11000)-b-MMA(63,000) M<sub>w</sub>/M<sub>n</sub>=1.6  
Composition from <sup>1</sup>H NMR

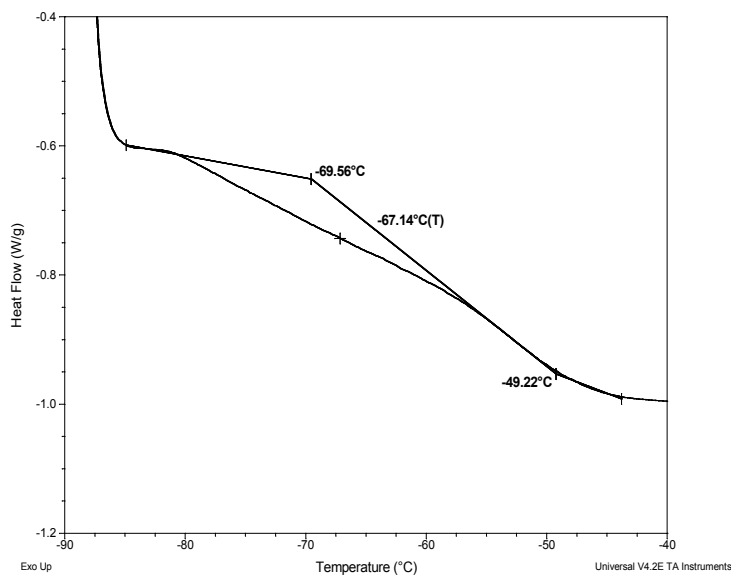
Thermal analysis of the sample# P11126A-EOMMA

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 ( $T_g$ ).

Thermogram for the MMA block



Thermogram for the PEO block



Thermal analysis results at a glance

For PMMA block		
$T_g$ : 101°C	$T_m$ : -	$T_c$ : -
For PEO block		
$T_g$ : -67 °C	$T_m$ : 48°C	$T_c$ : Not observed

Melting and crystallization curve for the sample

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.

Melting curve for PEO block

