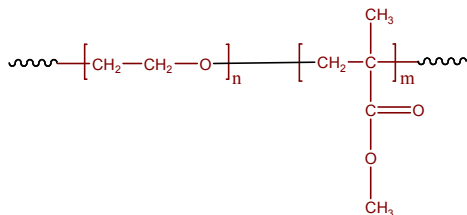


Sample Name:

Poly(ethylene oxide-b-methylmethacrylate)

Sample #: P3946 F2-EOMMA

Structure:

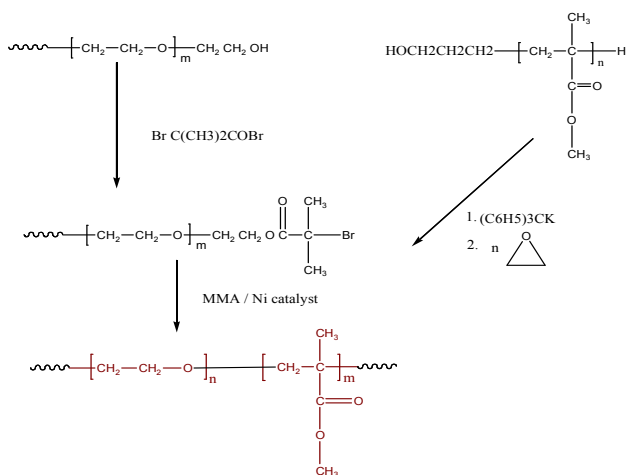


Composition:

Mn x 10 ³ PEO-b-MMA	PDI
2.0-b-8.5	1.15

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:

From the obtained polymer the un-reacted PEG can be removed by stirring the polymer in hot water. The obtained polymer dissolved in CHCl₃/Toluene and pass through the column packed with silica. The diblock copolymer obtained by second route where the macroinitiator of PEG bearing Br terminal group was used to initiate polymerization of MMA. The obtained polymer dissolved in toluene/CHCl₃ 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 macroinitiator. The polymer was recovered by precipitation in cold ether/hexane mixture.

Characterization:

Polymer composition was determined by H NMR taking the integration of PEG block at 3.6 ppm and methyl ester of PMMA block at 3.5 ppm. Molecular weights of the first block and the Mw/Mn of the final and the first block was determined by SEC in THF at 30°C.

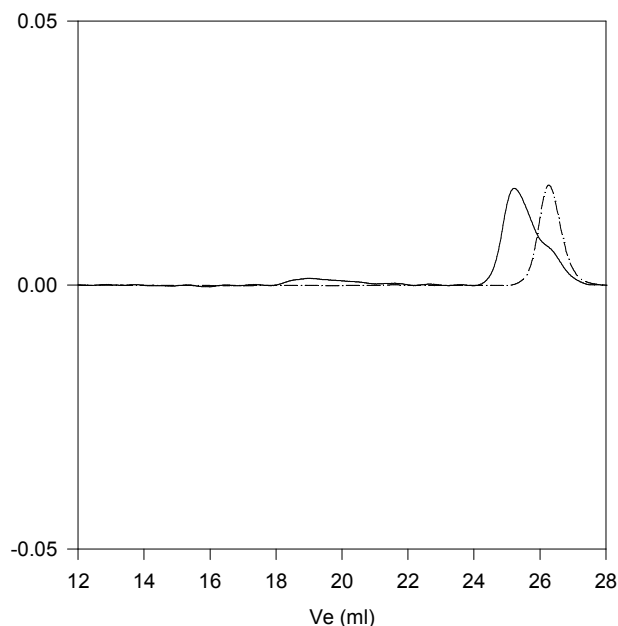
Solubility:

Poly(ethylene oxide -b- MMA) is soluble in CHCl₃, THF, toluene. The polymer precipitated out from hexane.

¹H-NMR Spectrum of the block copolymer:

SEC of the block copolymer:

P3046F2-EOMMA



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

--- PEO, M_n=2000, M_w=2200, Mw/Mn=1.10
— Poly(ethylene glycol-b-Methylmethacrylate)
Mn: PEO(2000)-b-MMA(8500) Mw/Mn=1.15
Composition from ¹H NMR

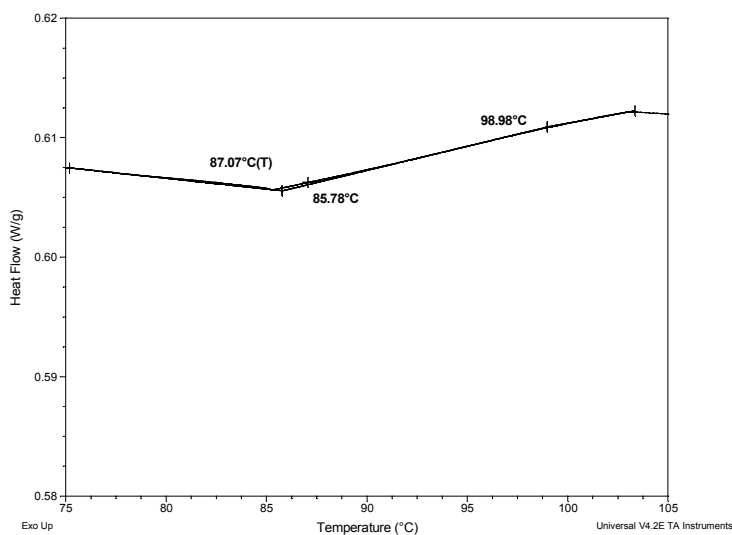
Thermal analysis of the sample# P3946 F2-EOMMA

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).

Thermal analysis results at a glance

For PMMA block		
T_g : 114°C	T_m : -	T_c : -
For PEO block		
T_g : -60°C	T_m : 57°C	T_c : 15°C

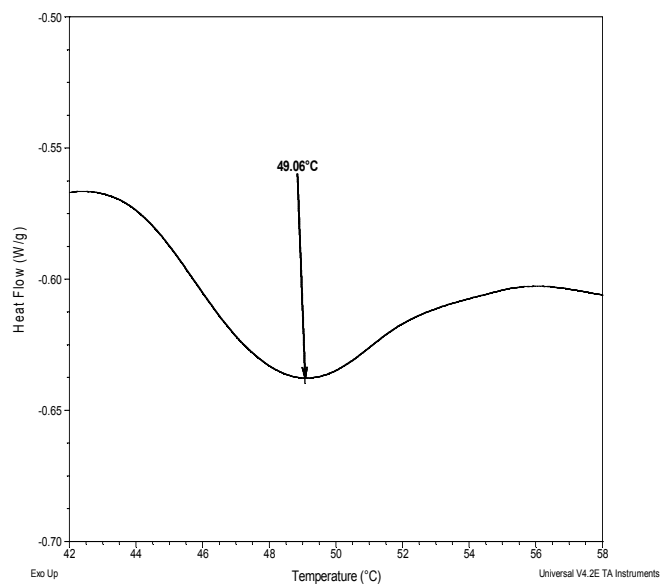
Thermogram for the MMA block



Melting curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak..

Melting curve for PEO block



Thermogram for PEO block

