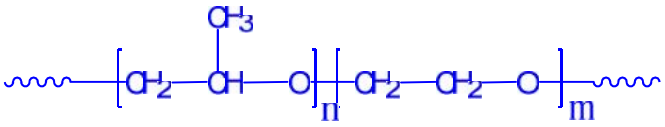
Sample Name: Poly(propylene oxide -b-ethylene oxide)

Sample #: P11107-EOPO

Structure:

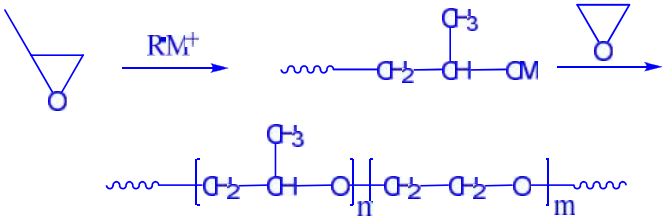


Composition:

Mn x 10^3 PPO-b-PEO	PDI
9.0-b-10.0	1.34
Total Mw by LS: 19.5	

Synthesis Procedure:

Poly(ethylene oxide-b-propylene oxide) is prepared by living anionic polymerization with sequence addition of propylene oxide followed by ethylene oxide or vise versa depending on the chemical compositions. The scheme of the reaction is illustrated below:



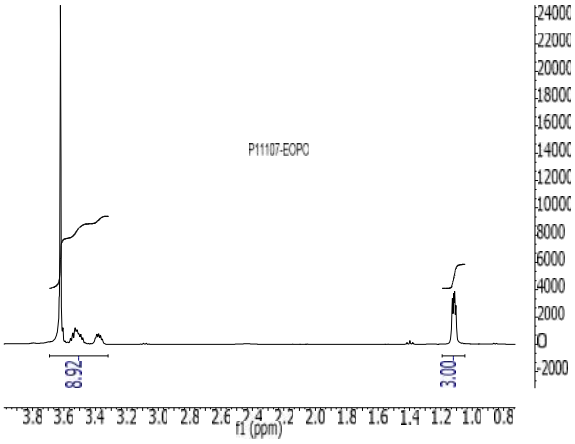
Characterization:

An aliquot of the anionic poly(propylene oxide) block was terminated before addition of ethylene oxide and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about 3.6 ppm with the propylene oxide protons (CH(CH3)at about 1.08 ppm.

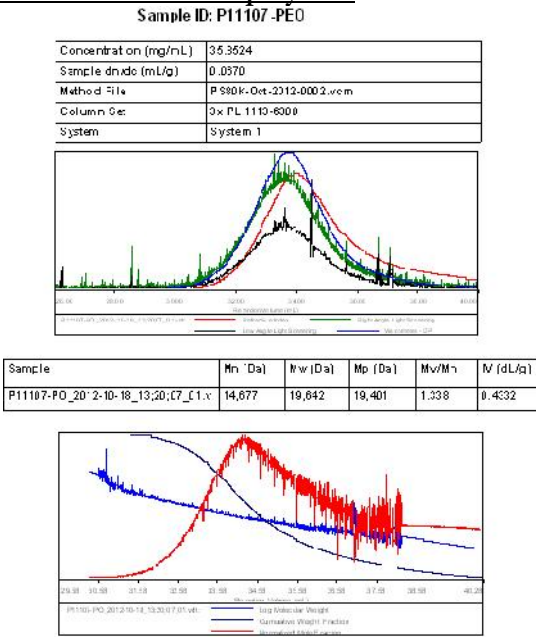
Solubility:

Poly(ethylene oxide -b- propylene oxide) is soluble in CHCl3, THF and methanol ethanol.

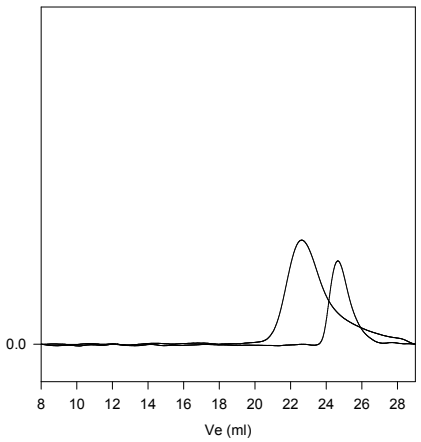
^{1}H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:



P11107-POEO (EOPO)



Size exclusion chromatography of poly(Popylene oxide-b-Ethylene Oxide):

—— PPO Block M_n=9000, M_w=11,000, PI=1.22

—— Block Copolymer PPO(9000)-b-PEO(10,000), PI=1.34

Thermal analysis of the sample# P11107-EOPO

Thermal analysis of the samples 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).

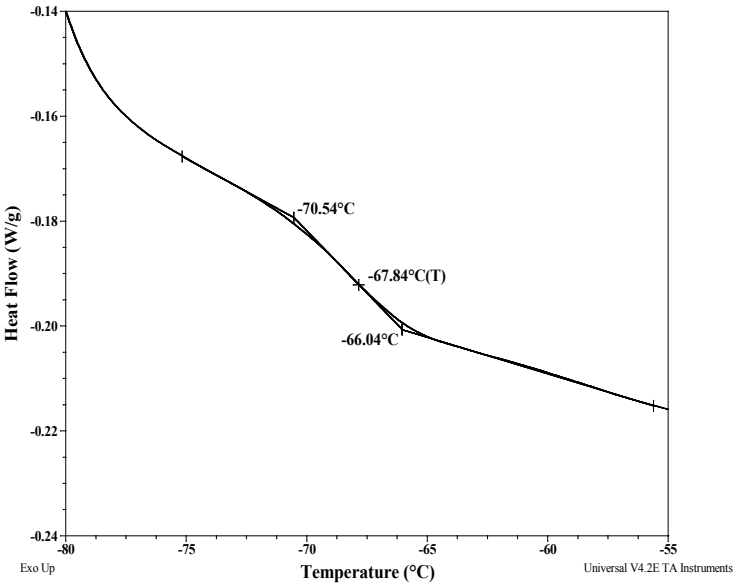
Melting and crystallization curve for the sample

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.

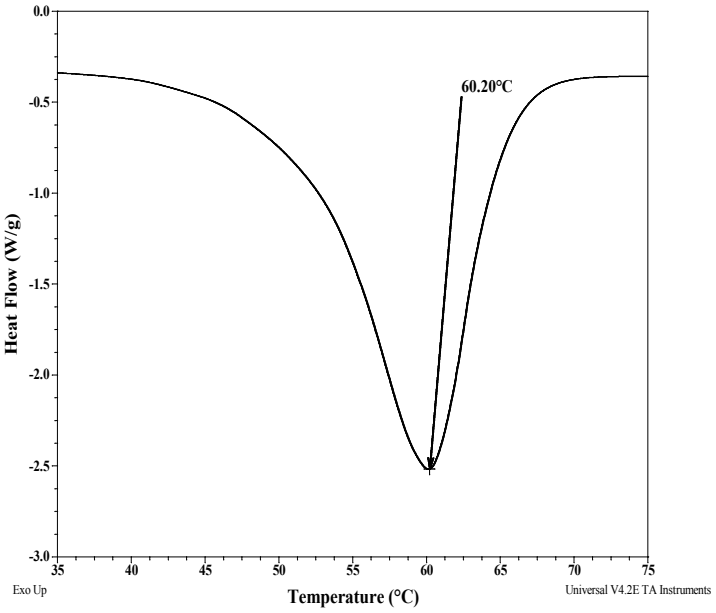
Thermal analysis results at a glance

Sample	T_m (°C)	T_c (°C)	T_g (°C)
EO block	60	35	Not distinct
PO block	-	-	-68

Thermogram for PO block



Melting curve for EO block:



Crystallization curve for EO block: