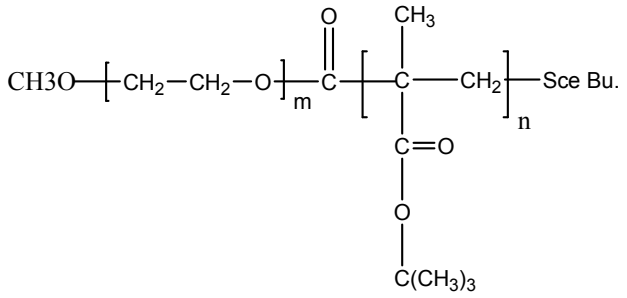
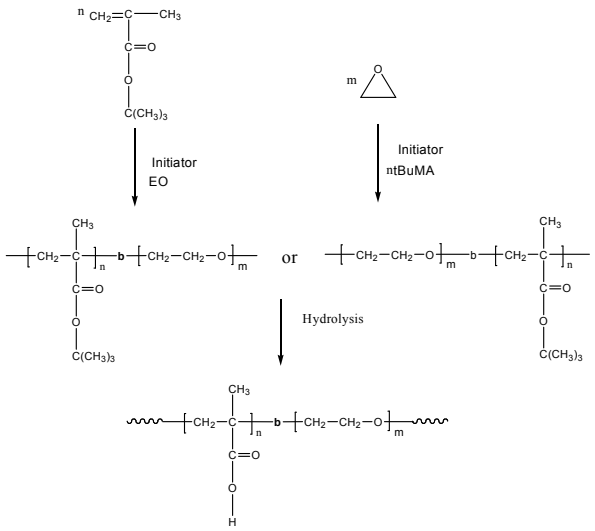
Sample Name: Poly(ethylene oxide -b-tert.butylmethacrylate)
Sample #: P8314-tBuMAEO
Structure:



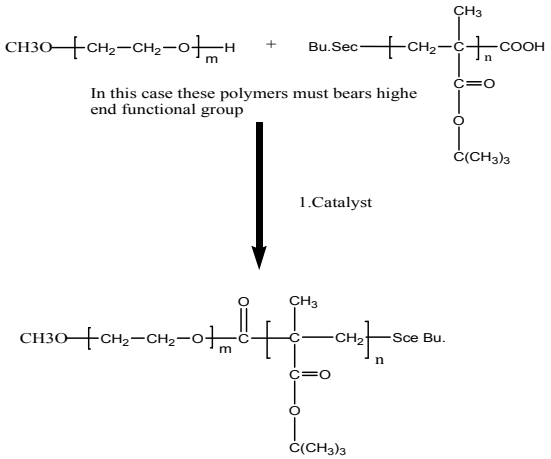
Composition:

Mn × 10^3 PEO-b-PtBuMA	PDI
8.5-b-1.5	1.3

Synthesis Procedure:
Poly(ethylene oxide -b- methylacrylic acid) is prepared by 2 different routes: i). By living anionic polymerization of sequential addition of EO and tBuMA (ethylene oxide or t-butyl methacrylate) followed by hydrolysis of the t-butyl group[1] or ii). by chemical coupling reaction of the corresponding functionalized polymer. The scheme of the reaction is illustrated below:

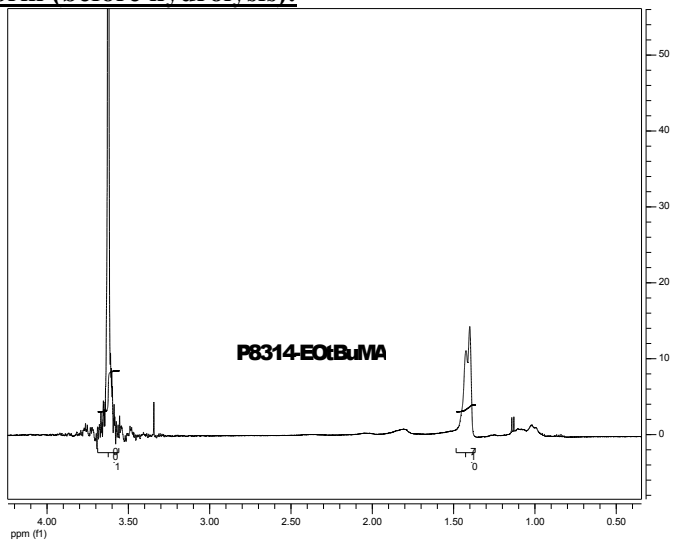


or

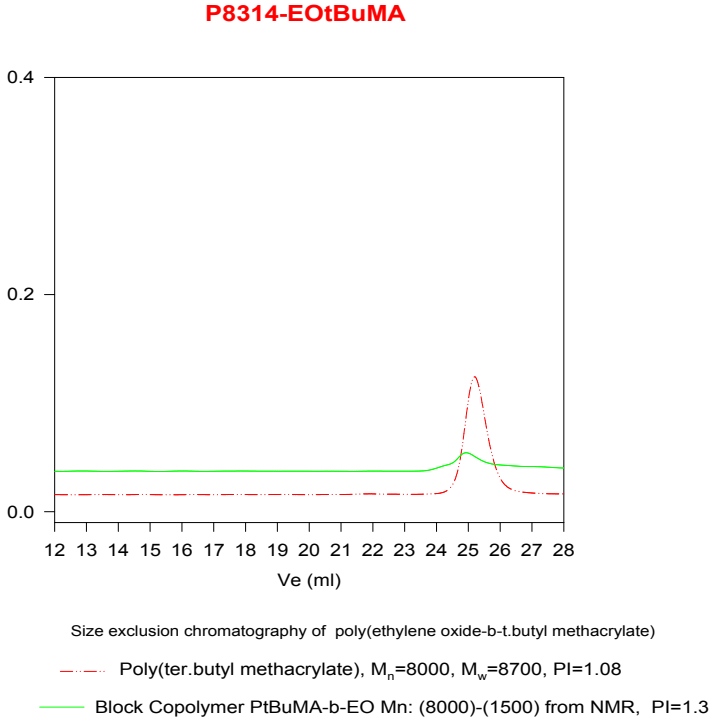


Characterization:
An aliquot of the first anionic block was terminated before addition of the second block and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about about 3.6 ppm with the tert.butyl protons at about 1.4 ppm.

^{1}H-NMR Spectrum of the block copolymer in ester form (before hydrolysis):



SEC of the block copolymer:



References:
J. Wang, **S. K. Varshney**, J. Jerome and Ph. Teyssie "Synthesis of AB (BA) ABA and BAB Block copolymers of tert-butylmethacrylate (A) and ethylene oxide (B) " *CA Vol 117, 16, 151478, J. Polym. Sci., Part-A: Polym. Chem. Ed., 1992, 30, 2251-2261.*

Thermal analysis of P8314-tBuMAEO

Thermal analysis of the samples 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).

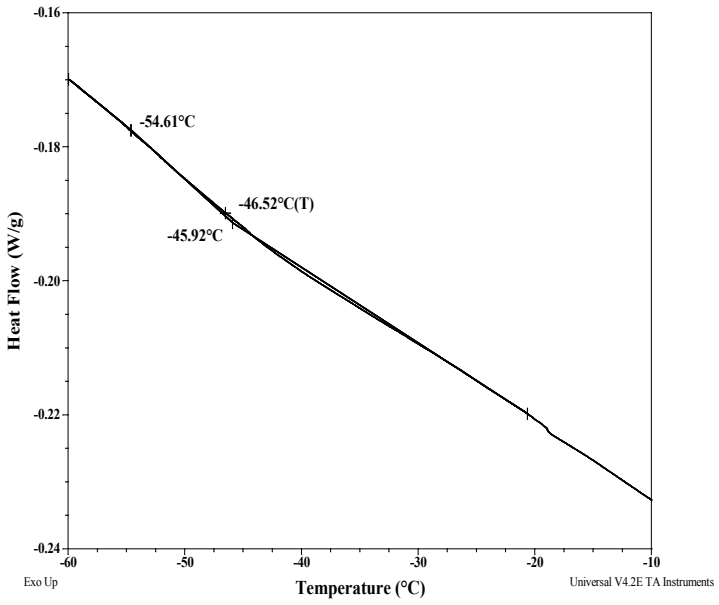
Melting and crystallization curve for the sample

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.

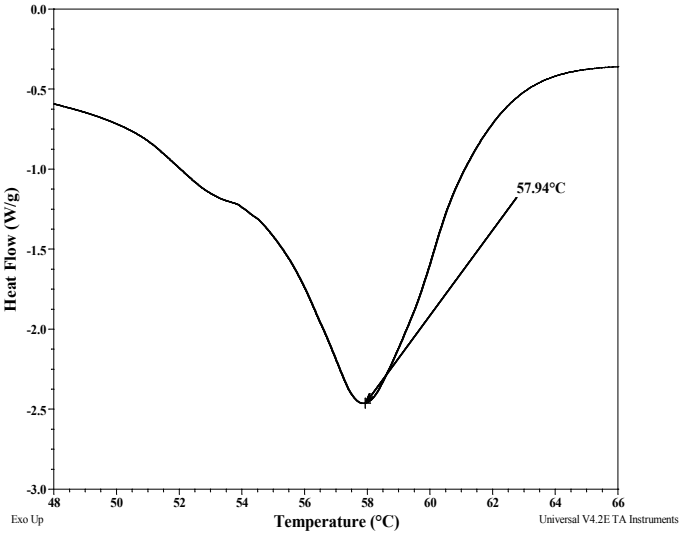
Thermal analysis results at a glance

Sample	T_m (^{o}C)	T_c (^{o}C)	T_g (^{o}C)
EO	58	36	-47
tBuMA	-	-	Not distinct

Thermogram for the PEO block



Melting curve for EO block:



Crystallization curve for EO block: