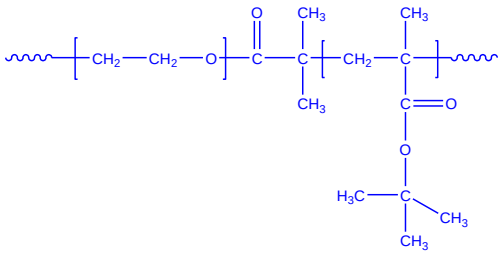
Sample Name: **Poly (t-butyl methacrylate -b-ethylene oxide)**

Sample #: **P7368-tBuMAEO**

Structure:

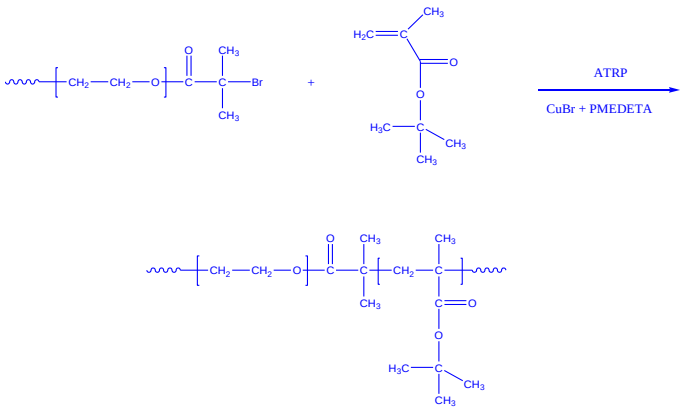


Composition:

Mn x 10^3 PEO-b-PtBMA	PDI
14.4-0.7	1.1

Synthesis Procedure:

Poly(ethylene oxide -b- tert-butyl methylacrylate) is prepared by ATRP using bromo-terminated poly(ethylene glycol) as the macro-initiator. The scheme of the reaction is illustrated below:



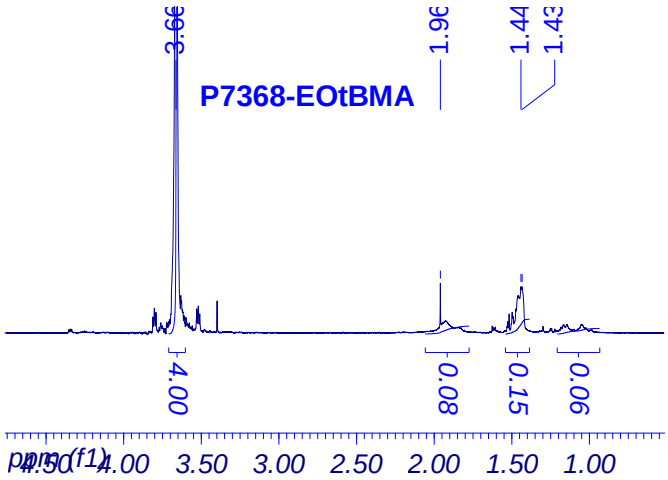
Characterization:

PEG-Br and final block copolymer were analyzed by size exclusion chromatography (SEC) to obtain the molecular weight of PEG and polydispersity index (PDI) for both PEG and block copolymer. 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.

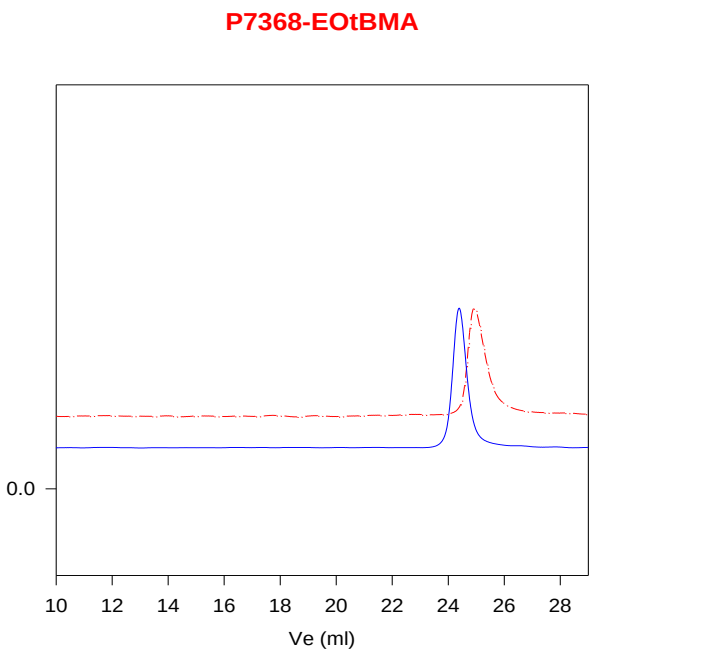
Solubility:

Poly(ethylene oxide -b- t-butyl methacrylate) is soluble in THF, acetone, and chloroform and it precipitates out in hexane if t-butyl methacrylate block is not that long.

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



SEC of the block copolymer:



Size exclusion chromatography of poly(ethylene oxide-b-t-butyl methacrylate)

PEO, M_n=14400, M_w=15700, Mw/Mn=1.09

Poly(ethylene oxide-b-t-butyl methacrylate)

Mn: PEO(14400)-b-tBMA(700) Mw/Mn=1.1

Thermal analysis of the tBuMAEO sample#7368

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).

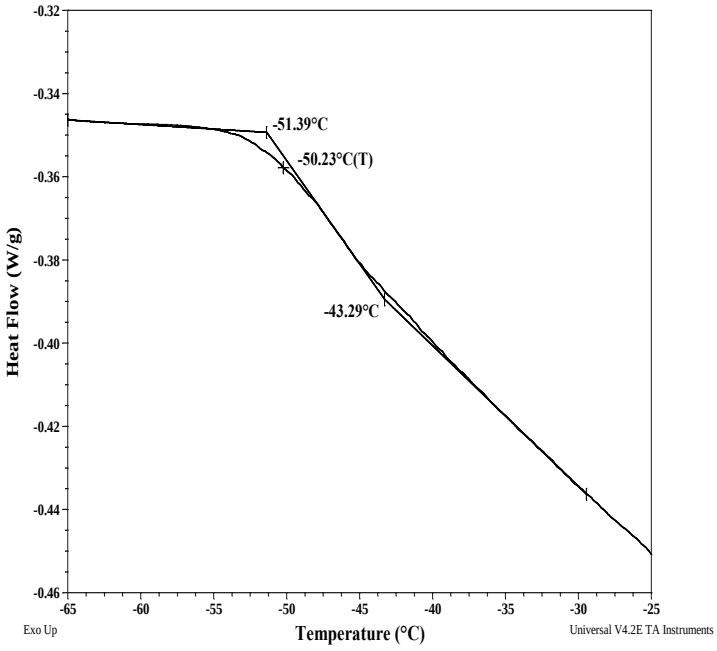
Melting and crystallization curve for the sample

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.

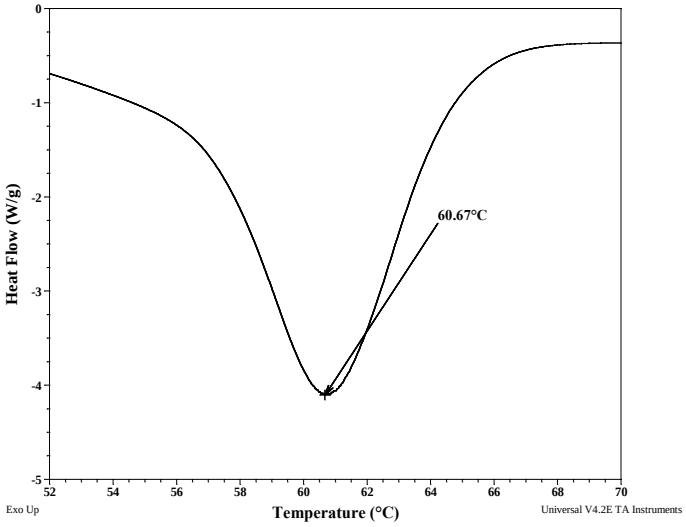
Thermal analysis results at a glance

Sample	T_m (°C)	T_c (°C)	T_g (°C)
EO	61	45	-50
tBuMA			Not distinct

Thermogram for the PEO block



Melting curve for EO block:



Crystallization curve for EO block: