Sample Name:
Poly(ethylene oxide -b- acrylic acid)

Sample #: P10961B-EOAA
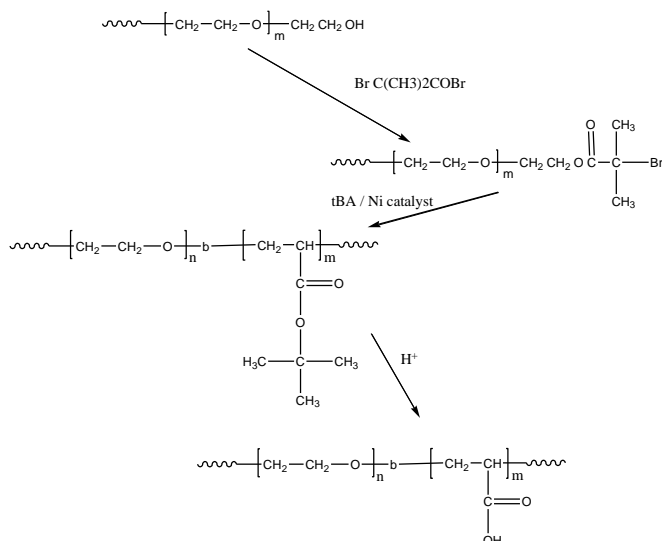
Structure:

Composition:

Mn × 10^3 PEO-b-PAA	PDI
3.8-b-7.0	1.3
Presence of ter.butyl ester	> 7%

Synthesis Procedure:

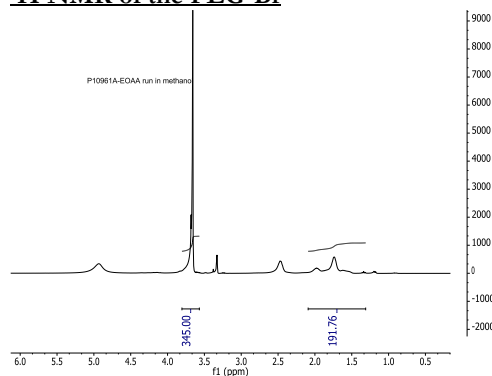The polymer is prepared by the following scheme:

Characterization:

The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy of poly(ethylene oxide -b- t-butyl acrylate) by comparing the peak area of the t-butyl acrylate protons at 1.43 ppm with the peak area of the ethylene oxide protons at 3.6 ppm, then transferred to the EOAA form accordingly. Copolymer PDI is determined by SEC of poly(ethylene oxide -b- t-butyl acrylate).
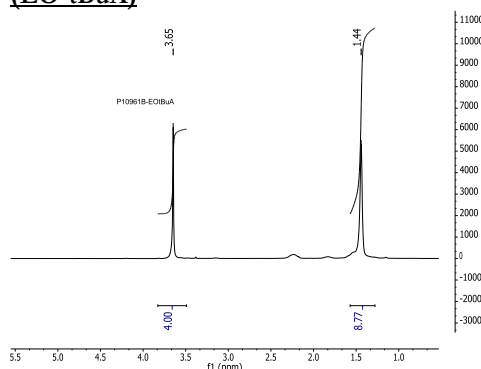
Solubility:

The polymer is soluble in CHCl3, methanol, THF and precipitated out from cold hexane or ether.
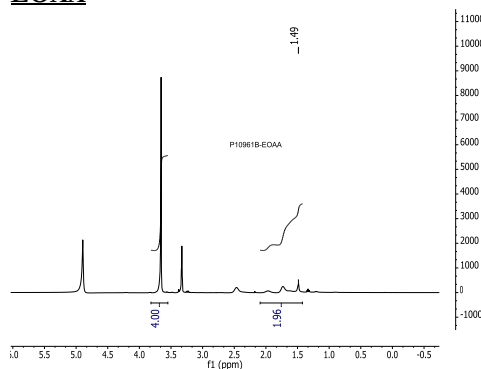
^{1}H NMR of the PEG-Br

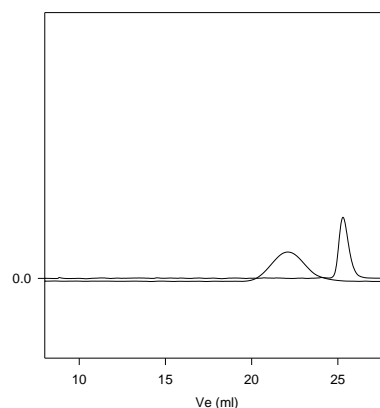**H-NMR Spectrum of the block copolymer (EO-tBuA)**

EOAA

SEC of the block copolymer before hydrolysis:

P10960B-EOAA

Size exclusion chromatography of poly(ethylene oxide-t-butyl acrylate)
—— Poly(ethylene oxide), M_n=3800, M_w=4000, PI=1.05
—— Block Copolymer PEO(3800)-b-PtBA(11,500 from NMR), PI=1.3

After hydrolysis
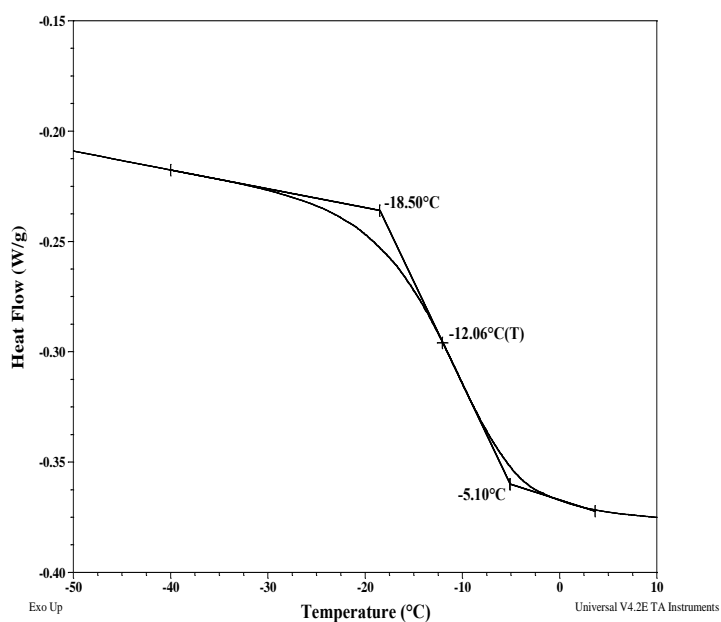Block Copolymer PEO(3800)-b-PAA(7000 from NMR), PI=1.3

Thermal analysis of the P10961B- EOAA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10\,^{\circ}C/min$. 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.

Thermogram for the EO block

Exo Up   Universal V4.2E TA Instruments

Typical thermal analysis results at a glance:

Sample	T_m (°C)	T_c (°C)	T_g (°C)
EO	-	-	-12
AA			85

Thermogram for AA block:

Exo Up   Universal V4.2E TA Instruments