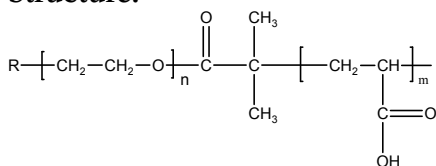


Sample Name:

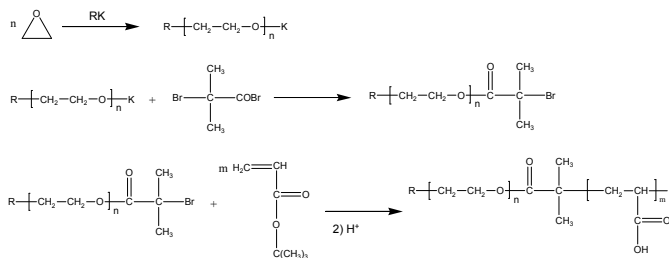
Poly(ethylene oxide -b- acrylic acid)

Sample #: P6348-EOAA**Structure:****Composition:**

$M_n \times 10^3$ PEO-b-PAA	PDI
2.0-b-2.4	1.10

Synthesis Procedure:

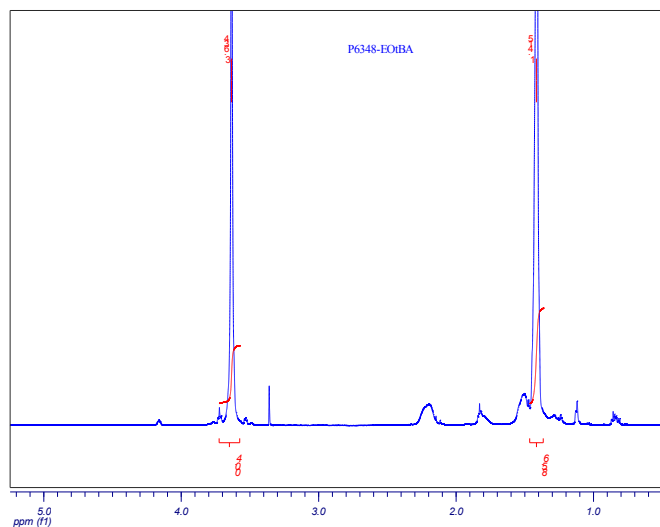
Poly(ethylene oxide -b- acrylic acid) is prepared by living anionic polymerization of ethylene oxide and controlled radical polymerization of-butyl acrylate followed by hydrolysis of the t-butyl group. The scheme of the reaction is illustrated below:

**Characterization:**

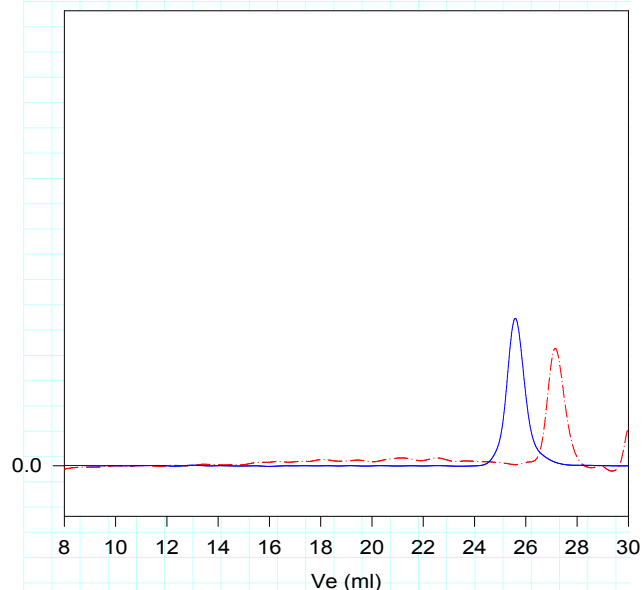
An aliquot of the anionic poly(ethylene oxide) block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^1H -NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about 3.6 ppm with the t-butyl protons (before hydrolysis) at about 1.43 ppm.

Solubility:

Poly(ethylene oxide -b- acrylic acid) is soluble in water and methanol. It precipitates from hexanes, ether and acetone, dependant on the composition.

 ^1H -NMR Spectrum of the block copolymer:**SEC of the block copolymer:**

P6348-EOtBA
(Precursor of P6348-EOAA)



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

--- PEO, $M_n=2000$, $M_w=2100$, $M_w/M_n=1.05$

— Poly(ethylene oxide-b-tert-butylacrylate)

 M_n : PEO(2000)-b-PtBA(4200) $M_w/M_n=1.10$

After hydrolysis: PEO(2000)-b-PAA(2400)

Thermal analysis of the P6348-EOAA

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).

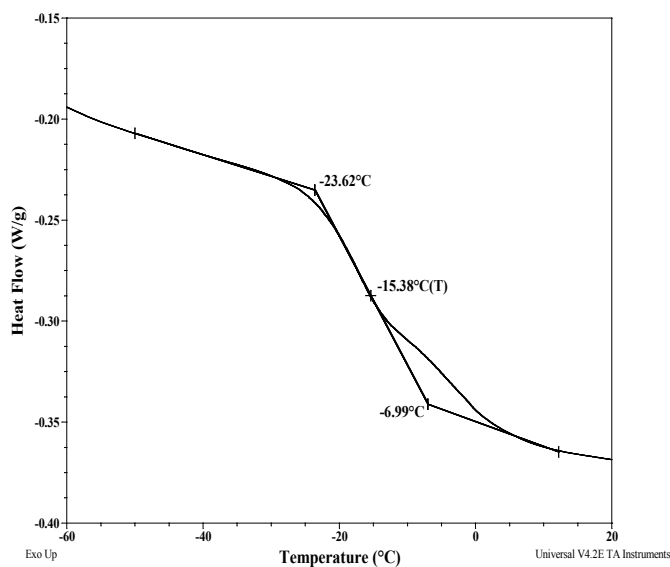
Melting and crystallization curve for the sample

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.

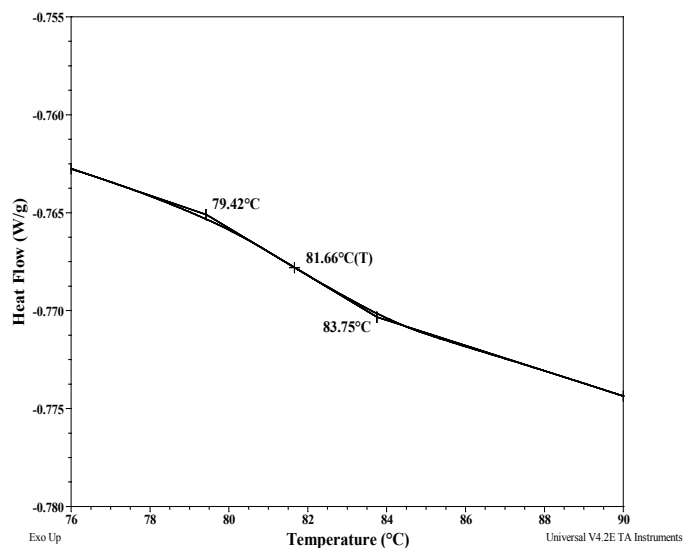
Typical thermal analysis results at a glance:

Sample	T_m (°C)	T_c (°C)	T_g (°C)
EO	48	-	-15
AA			82

Typical thermogram for the EO block



Thermogram for AA block:



Melting curve for EO block:

