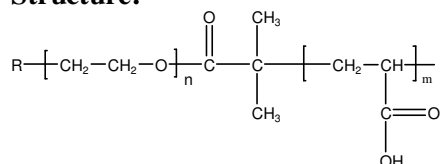


Sample Name:
Poly(ethylene oxide -b- acrylic acid)

Sample #: **P6353A-EOAA**

Structure:

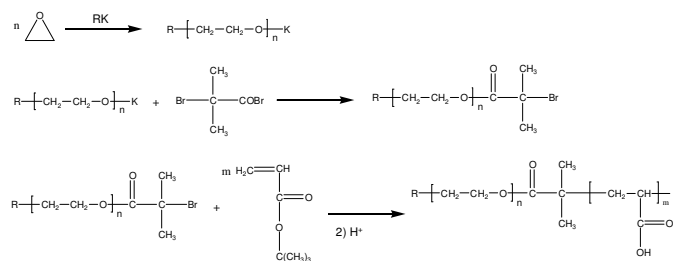


Composition:

$\text{Mn} \times 10^3$ PEO-b-PAA (k)	PDI
5.0-b-6.7	1.20

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:



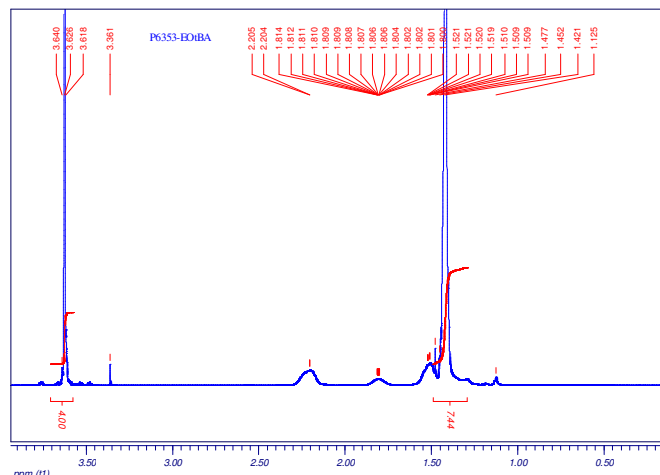
Characterization:

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.

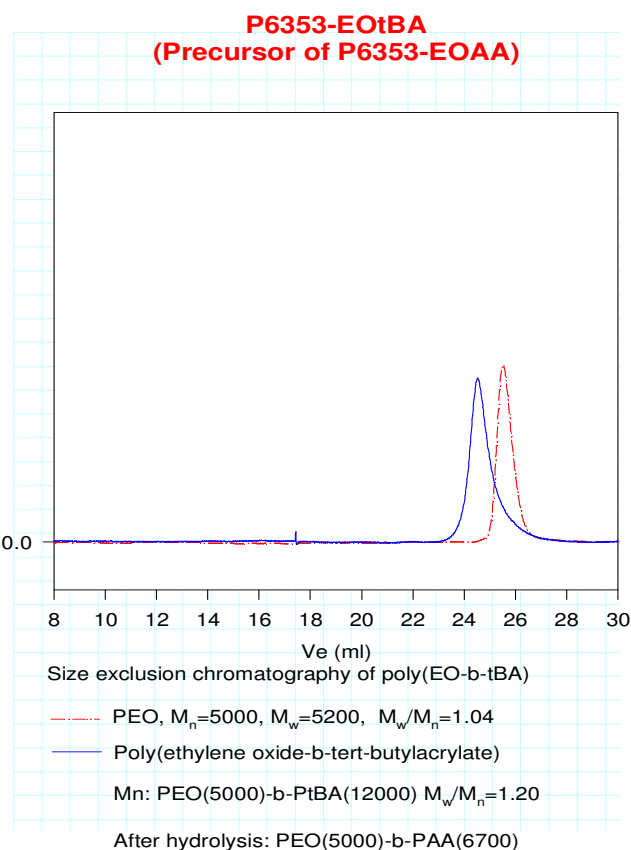
Solubility:

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:



Thermal analysis of the P6353 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).

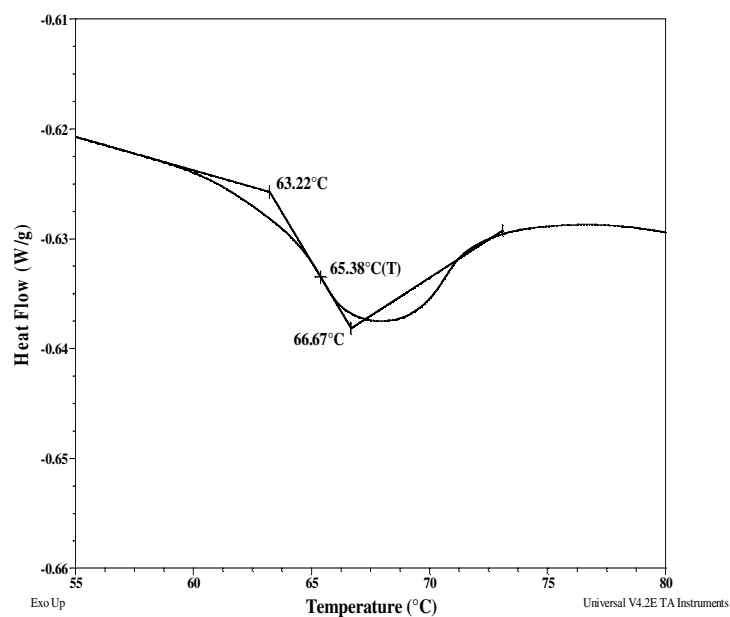
Melting and crystallization curve for the sample

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	-	-	-15
AA			65

Thermogram for AA block:



Thermogram for the EO block

