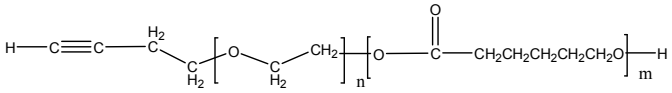
Sample Name:

Alkyne end functionalized Poly(ethylene oxide -b- ε-caprolactone)

Sample #: **P10221A- AlkyneEOCL**

Structure:

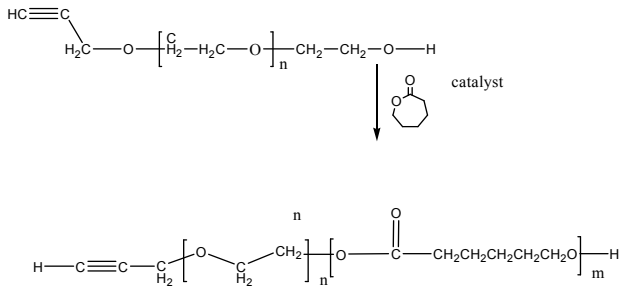


Composition:

Mn x 10^3 AlkynePEG-b-PCL	PDI	alkyne functionality
3.0-b-73.0	1.4	>95%

Synthesis Procedure:

The scheme of the reaction is illustrated below:

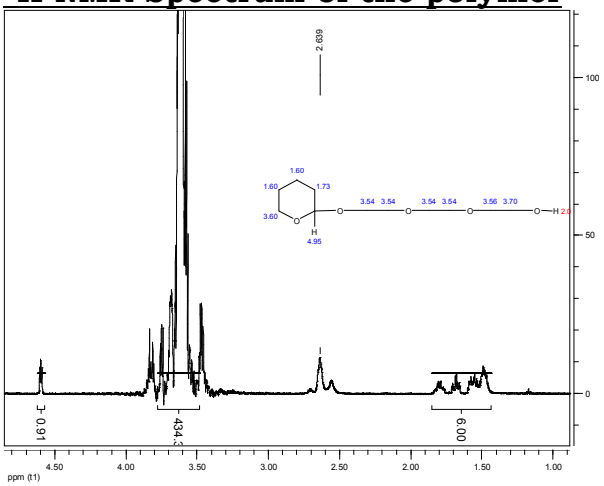


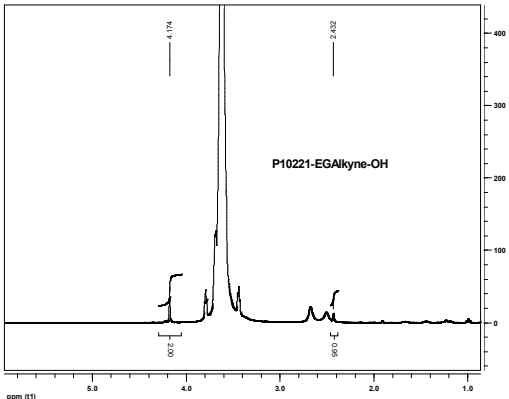
Characterization:

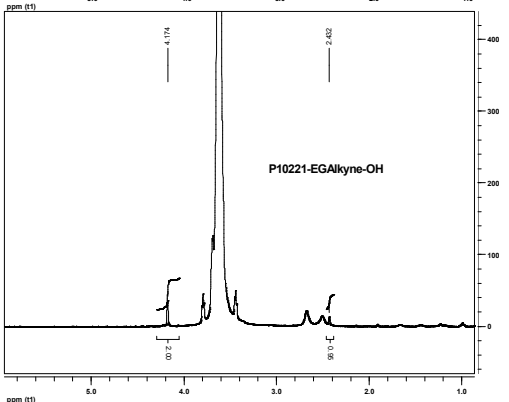
An aliquot of the anionic poly(ethylene oxide) block was terminated before addition of caprolactone and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The polymer obtained at each step and the final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about about 3.6 ppm with the ε-caprolactone protons at about 4.1 ppm.

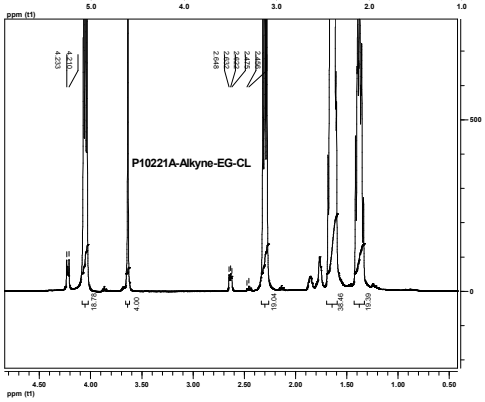
Thiol end functionalized Poly(ethylene oxide -b- ε-caprolactone) is soluble in CHCl3, THF,and precipitated out from cold ethanol, diethyl ether.

^{1}H-NMR Spectrum of the polymer



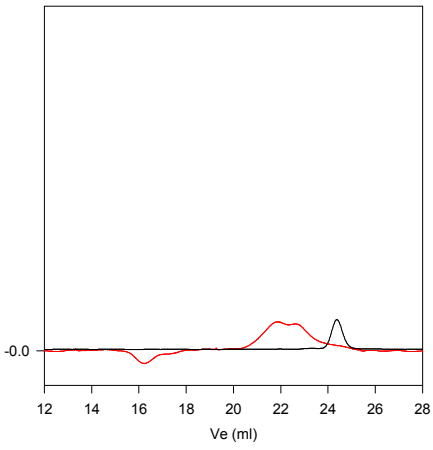






SEC of the block copolymer:

P10221A-AlkyneEGCL



Size exclusion chromatograph of poly(ethylene glycol):

PEG-Alkyne: M_n=3000, M_w=3300, PI=1.08

Alkyne-EG-b-CL: 3000-b-73,000 PI 1.4

Thermal analysis of the P10221A-AlkyneEOCL

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).

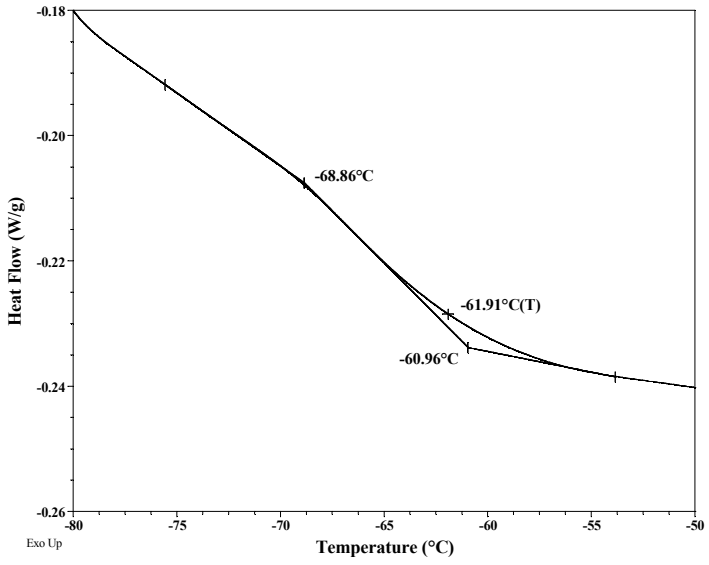
Melting and crystallization curve for the sample

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.

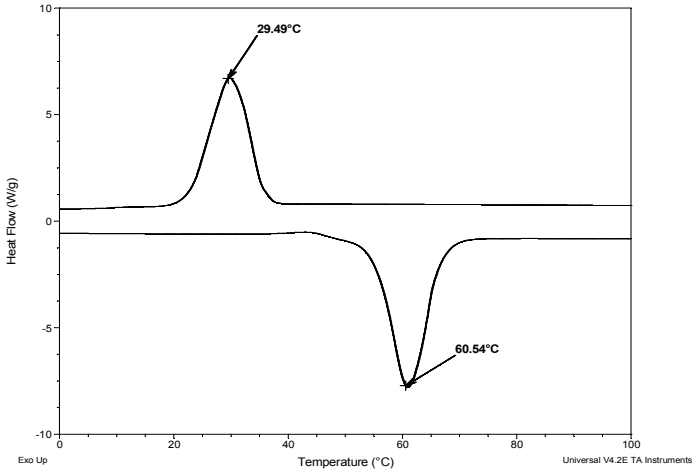
Typical thermal analysis results at a glance (PEO-b-CL=2-b-0.4)

Sample	T_m (°C)	T_c (°C)	T_g (°C)
EO	61	29	-65
ε-CL	55	29	-69
EOCL	58	31	-62

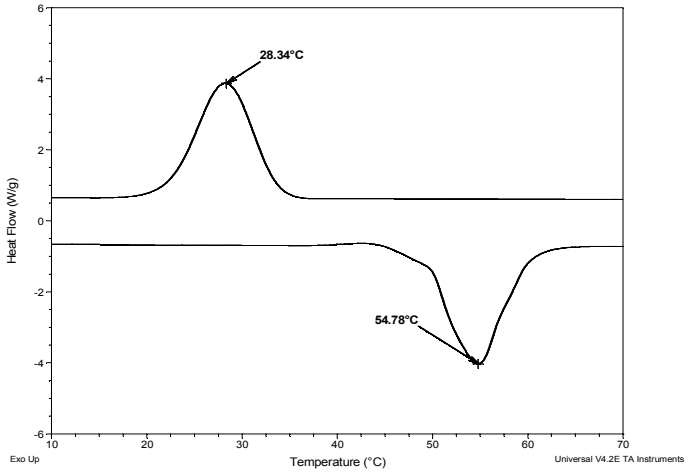
Typical thermogram for the PEO block



Thermogram of poly (ethylene glycol) methyl ether (Mn≈5000)



Thermogram of ε-caprolactone (Mn≈8000)



Typical thermogram for EOCL sample