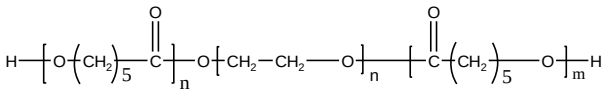
Sample Name:
Poly(ε-caprolactone - ethylene oxide -b- ε -caprolactone)

Sample #: P10682B- CLEOCL

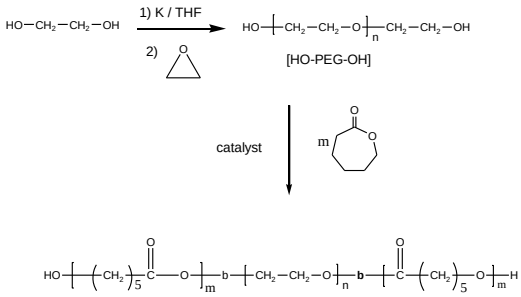
Structure:



Composition:

Mn x 10^3 PCL-b-PEO-b-PCL	PDI
1.95-b-4.0-b-1.95	1.18

Synthesis Procedure:
The polymer is prepared by living anionic polymerization of ethylene oxide and coordination polymerization of ε -caprolactone. The scheme of the reaction is illustrated below:



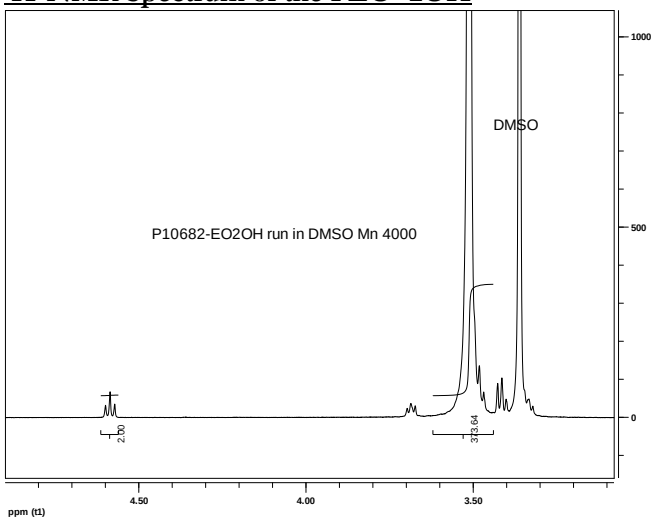
Characterization:
An aliquot of the anionic poly(ethylene oxide) block was terminated before addition of caprolactone and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR 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.

Solubility: Poly(ε -caprolactone - ethylene oxide -b- ε -caprolactone) is soluble in CHCl3, THF, DMF, toluene and precipitated out from cold ethanol and diethyl ether.

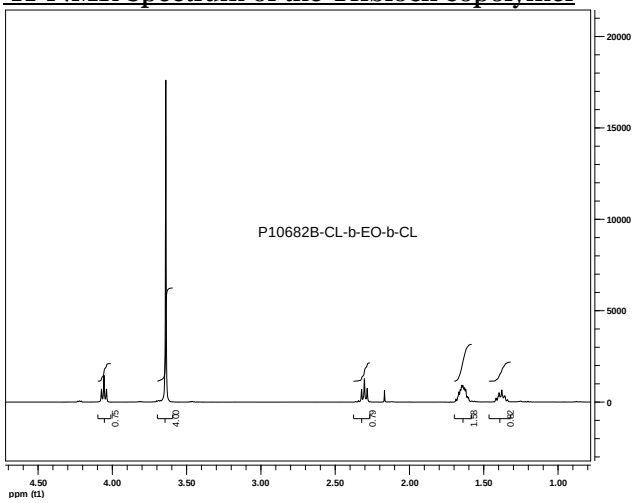
Purification of the obtained polymer:
Purification of the obtained polymer was carried out rigorously as follows to ensure the removal of the catalyst side product:

1. Dissolved the polymer in dried acetone and filter using Whatman Filter # 4.
2. Polymer solution dried on a small amount of Na2SO4 and the solution pass through a column packed with dried Al2O3.
3. Polymer solution pass through a Whatman filter paper and added slowly to diethyl ether.
4. Solution stirrer for 1h at room temperature.
5. Solution filter and dried under vacuum for over night at 40 oC.
6. It was packed under hood and sealed under vacuum.

^{1}H-NMR Spectrum of the PEO -2OH

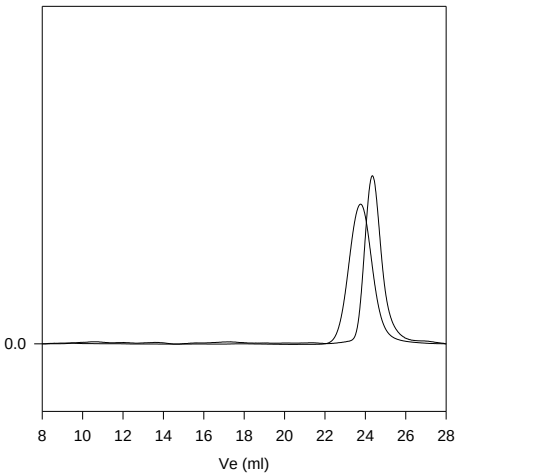


^{1}H-NMR Spectrum of the Triblock copolymer



SEC of the block copolymer:

P10682B-CLEOCL



Size exclusion chromatography:
—— Poly(ethylene glycol) diol, M_n=4,000, M_w=4,500, PI=1.05
—— Block Copolymer PCL(1,950) -PEO(4,000)-b-PCL(1,950), PI=1.18
Composition from ^{H} NMR