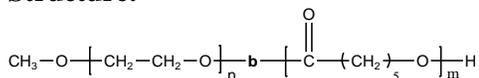


Sample Name:

**Poly(ethylene oxide -b-  $\epsilon$ -caprolactone)**

Sample #: P10904- EOCL

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup> PEO-b-PCL	PDI
5.0-b-4.0	1.15

**Synthesis Procedure:**

Poly(ethylene oxide -b-  $\epsilon$ -caprolactone) is prepared by living anionic polymerization of ethylene oxide and coordination polymerization of  $\epsilon$ -caprolactone.

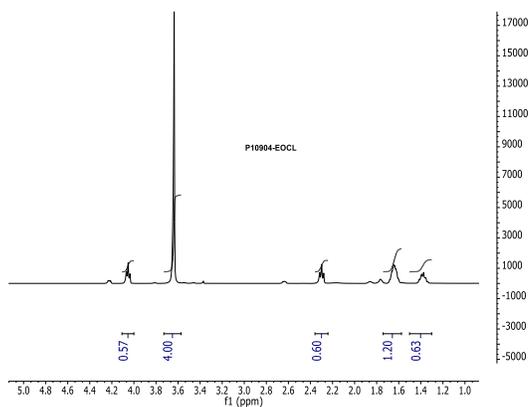
**Characterization:**

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 <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the ethylene oxide protons at about 3.6 ppm with the  $\epsilon$ -caprolactone protons at about 4.1 ppm.

**Solubility:**

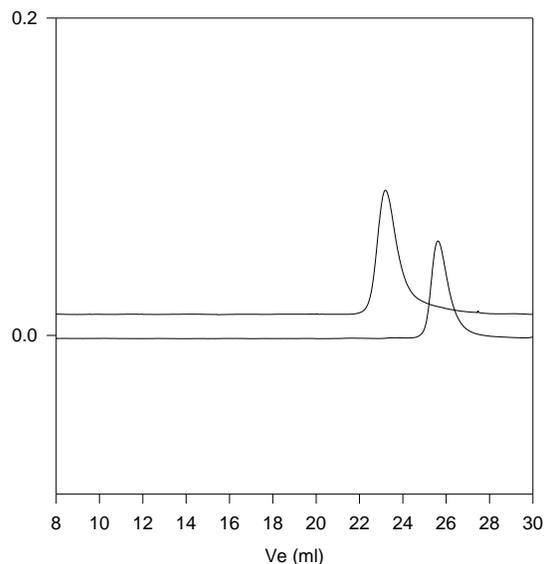
Poly(ethylene oxide -b-  $\epsilon$ -caprolactone) is soluble in CHCl<sub>3</sub>, THF, DMF, toluene and precipitated out from cold ethanol, diethyl ether.

**<sup>1</sup>H-NMR Spectrum of the block copolymer:**



**SEC of the block copolymer:**

P10904-EOCL



Size exclusion chromatography:

- Poly(ethylene glycol) methoxyl ether, M<sub>n</sub>=5000, M<sub>w</sub>=5600, PI=1.13
- Block Copolymer PEO(5000)-b-PCL(4000), PI=1.15  
Composition from <sup>1</sup>H NMR  
Dp: EO(144units)-b-CL (35units)

**Thermal analysis of the P10904-EOCL sample**

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<sub>g</sub>).

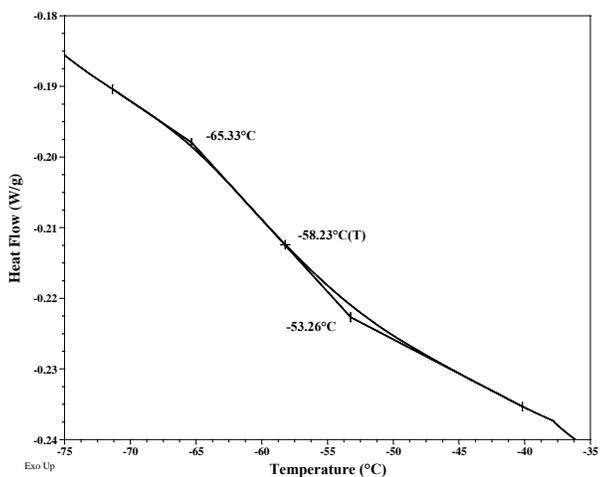
**Melting and crystallization curve for the sample**

The melting temperature (T<sub>m</sub>) was taken as the maximum of the endothermic peak whereas the crystallization temperature (T<sub>c</sub>) was considered as the minimum of the exothermic peak.

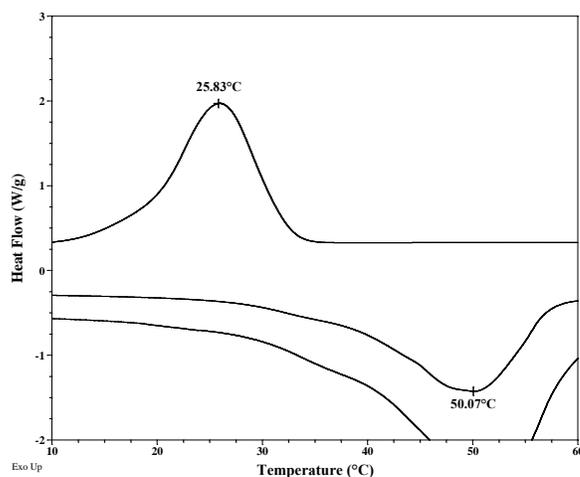
**Thermal analysis results briefly:**

Sample	T <sub>m</sub> (°C)	T <sub>c</sub> (°C)	T <sub>g</sub> (°C)
EO (5k)	61	29	-65
$\epsilon$ -CL (8k)	55	29	-69
EOCL	50	26	-58

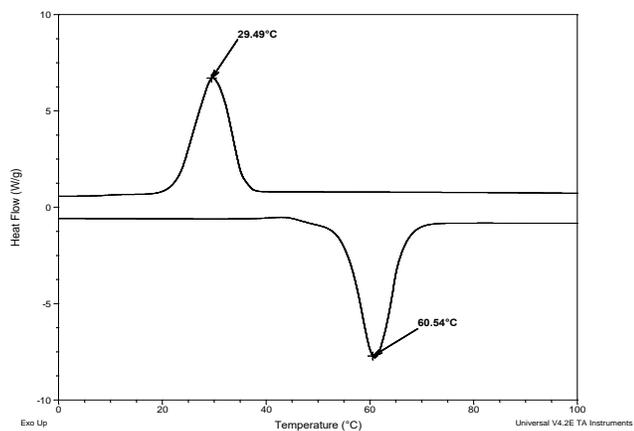
**Typical thermogram for the PEO block**



**Typical thermogram for EOCL sample**



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



**Thermogram of ε-caprolactone (Mn≈8000)**

