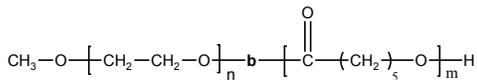


Sample Name:

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

Sample #: **P7019- EOCL**

**Structure:**



**Composition:**

$M_n \times 10^3$ PEO-b-PCL (k)	PDI
2.0-0.3	1.10

**Synthesis Procedure:**

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

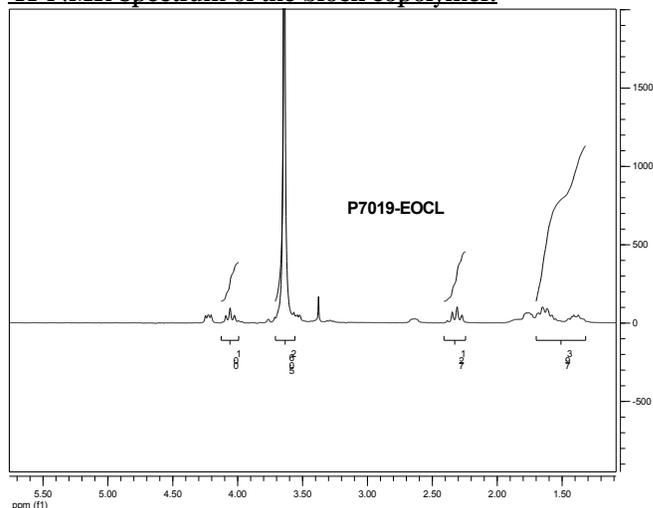
**Characterization:**

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  $^1\text{H-NMR}$  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:**

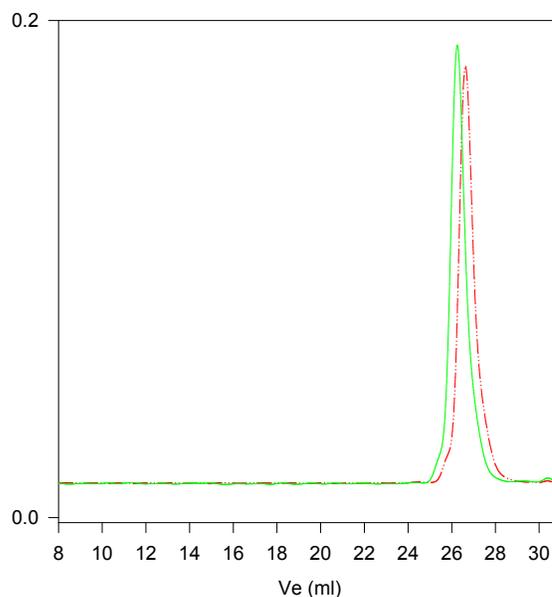
Poly(ethylene oxide -b-  $\epsilon$  -caprolactone) is soluble in  $\text{CHCl}_3$ , THF, DMF, toluene and precipitated out from cold ethanol, diethyl ether.

**$^1\text{H-NMR}$  Spectrum of the block copolymer:**



**SEC of the block copolymer:**

**P7019- EOCL**



Size exclusion chromatography:

- Poly(ethylene glycol),  $M_n=2000$ ,  $M_w=2200$ ,  $PI=1.13$
- Block Copolymer PEG(2000)-b-PCL(300),  $PI=1.10$   
Composition from  $^1\text{H NMR}$   
Dp: EO(45 units)-b-CL (4 units)

## Thermal analysis of the sample# P7019-EOCL

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°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 ( $T_g$ ).

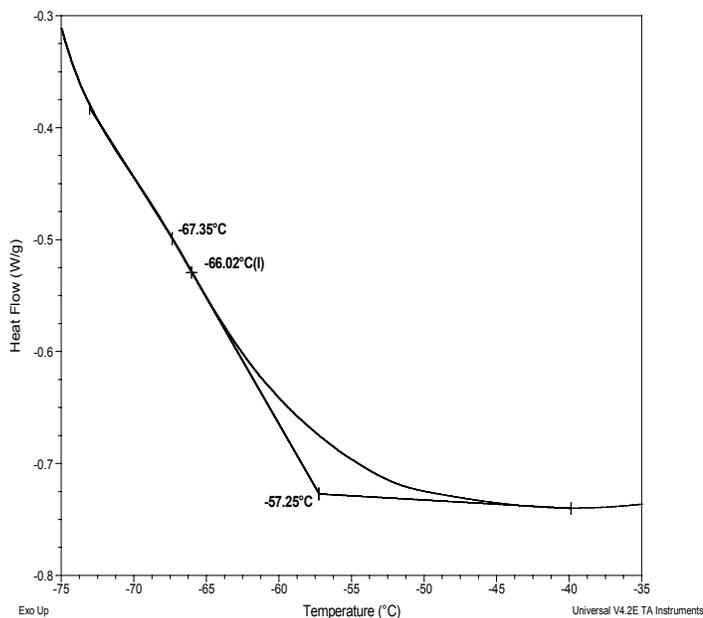
### Melting and crystallization curve for the sample

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.

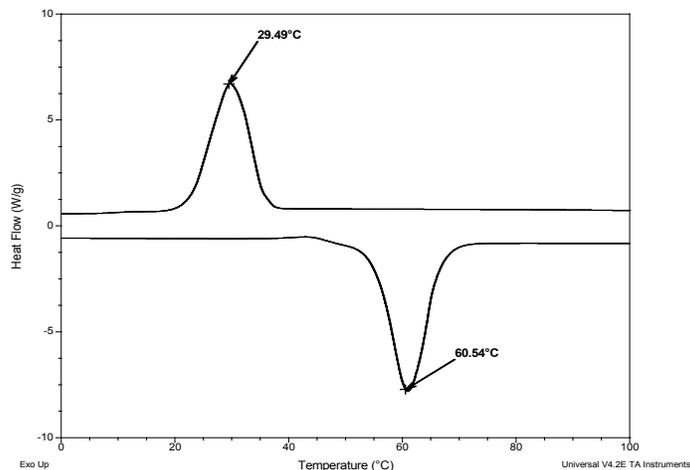
### Thermal analysis results at a glance

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
EO	61	29	-65
$\epsilon$ -CL	55	29	-69
EOCL	49	24	-66

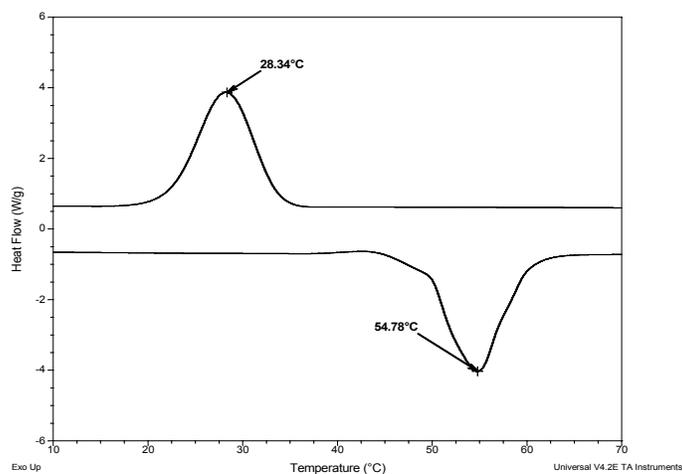
### Thermogram for the sample



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



## Thermogram of $\epsilon$ -caprolactone (Mn≈8000)



## Thermogram of #7019 EOCL sample

