

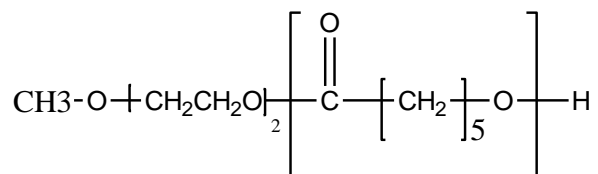
**Sample Name:** Poly( $\epsilon$ -caprolactone)

**SEC of Sample:**

**P7437-CL**

**Sample #:** P7437-CL

**Structure:**

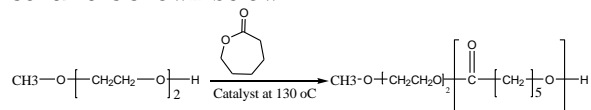


**Composition:**

$M_n \times 10^3$	PDI
7.0	1.2

**Synthesis Procedure:**

The polymerization of  $\epsilon$ -caprolactone can be initiated with a variety of catalysts based on aluminum, tin, barium or HCl. The reaction scheme is shown below:



**Purification:**

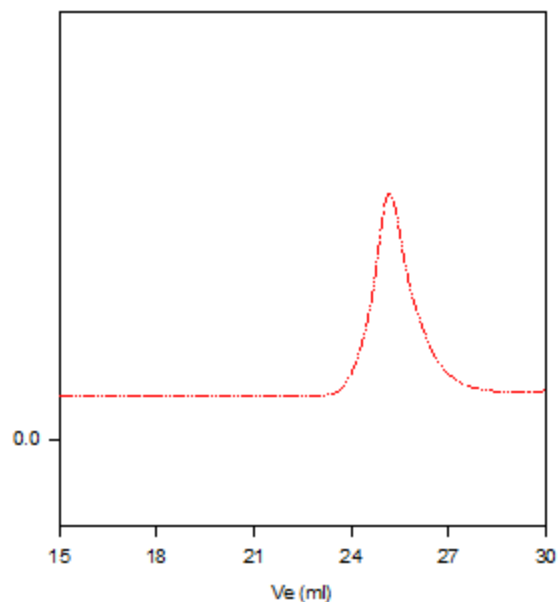
When metal catalysts are employed, the residues are removed by repeated extraction with an aqueous EDTA solution ( $0.1 \text{ mol L}^{-1}$ ) followed by washing with water up to neutral pH. The non-polar solvent (usually toluene) is removed under reduced pressure and the polymer is precipitated in a large excess of hexane. The polymer is then freeze-dried after dissolution in benzene.

**Characterization:**

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography.

**Solubility:**

Poly( $\epsilon$ -caprolactone) is soluble in toluene, THF,  $\text{CHCl}_3$  and  $\text{CH}_2\text{Cl}_2$ . The polymer is insoluble in methanol, hexane and ether.



Size exclusion chromatography result:

-----  $M_n=7000$ ,  $M_w=8500$   $PI=1.2$

Solution Viscosity in THF at  $35^\circ\text{C}$ :  $0.151 \text{ dL/g}$

$dn/dc$  in THF at  $35^\circ\text{C}$ :  $0.045 \text{ mL/g}$

Radius of Gyration:  $3.5 \text{ nm}$

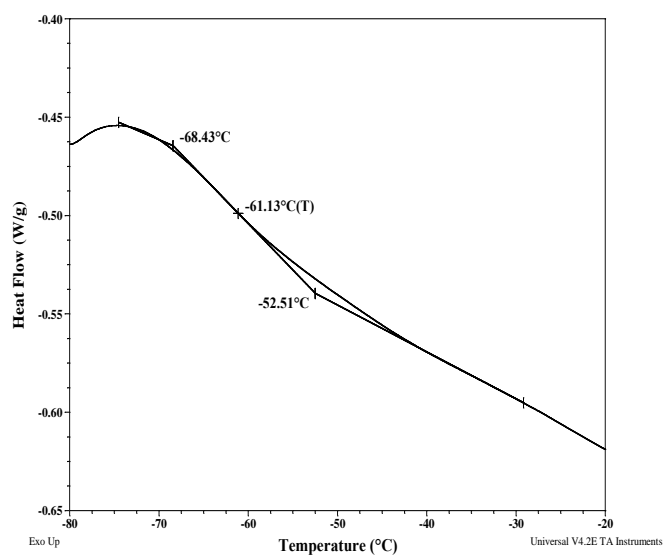
## Thermal analysis of the sample P7437-CL

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 ( $T_g$ ).

### Thermal analysis results at a glance

$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
63	33	-61

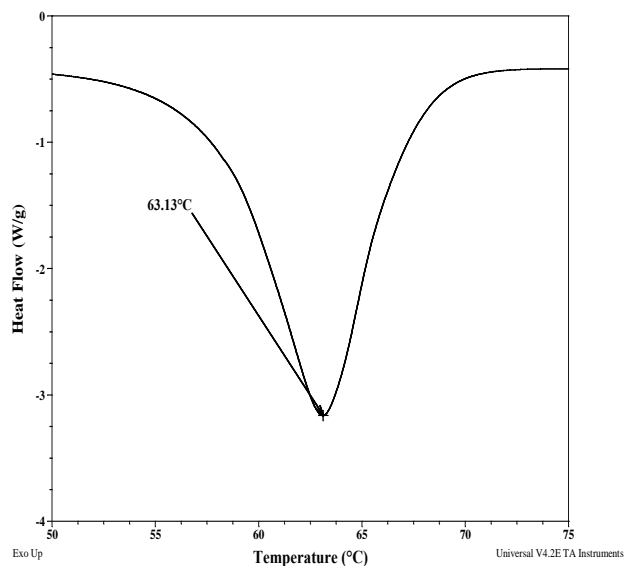
### Thermogram for the sample



## Melting and crystallization curves 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.

### Melting curve for the CL sample:



### Crystallization curve for the CL sample:

