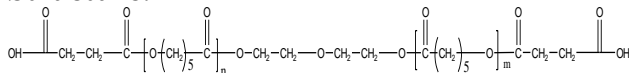


**Sample Name: α , ω -Dicarboxy ended
Poly(ϵ -caprolactone)**

Sample #: P7160-CL2COOH

Structure:

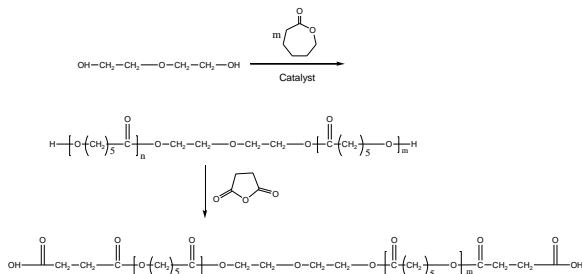


Composition:

Mn x 10 ³	PDI
7.2	1.11

Synthesis Procedure:

α - ω -dicarboxy end functionalized Poly(ϵ -caprolactone) is prepared by ring opening polymerization of ϵ -caprolactone and coordinated reaction with succinic anhydride. The scheme of the reaction is illustrated below:



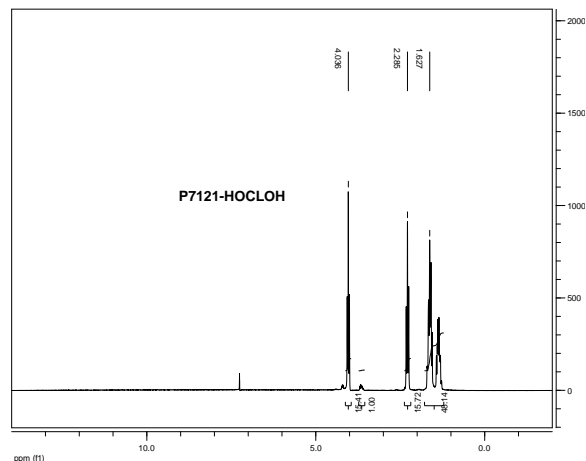
Characterization:

The molecular weight is calculated from NMR of poly(ϵ -caprolactone) by comparing by comparing the peak area of the diethylene glycol protons at about 3.6 ppm with the ϵ -caprolactone protons at about 4.1 ppm, which plus molecular weight of succinic anhydride moiety. The polydispersity index (PDI) is obtained by size exclusion chromatography using polystyrene calibrated columns. There is no GPC signal of α - ω -dicarboxy end functionalized Poly(ϵ -caprolactone) eluting in THF using above mentioned column, which proves the ends of the PCL are carboxyl.

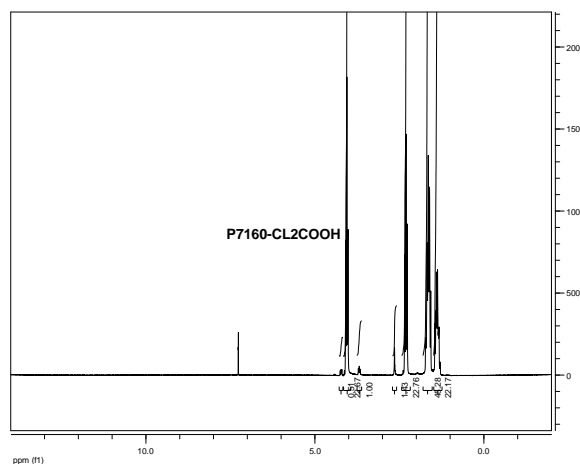
Solubility:

The polymer is soluble in toluene, THF, CHCl_3 and CH_2Cl_2 . The polymer is insoluble in methanol, hexane and ether.

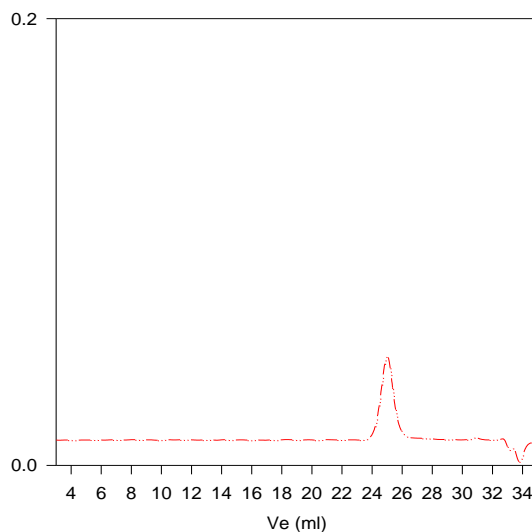
NMR of Sample a-ω dihydroxy terminated poly caprolactone:



NMR of Sample a- ω dicarboxy terminated Polycaprolactone



SEC of Sample of the product before dicarboxy functionalize:
P7121-HOCLOH



Size exclusion chromatography result:

..... $M_n=7000$, $M_w=7800$ $PI=1.11$ (M_n calculated from NMR)

Thermal analysis of the sample# P7160-CL2COOH

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).

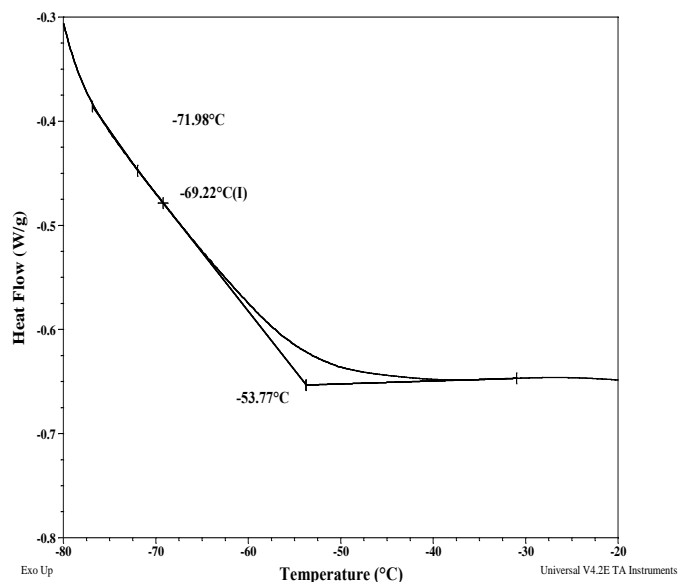
Melting and crystallization curve for the sample

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.

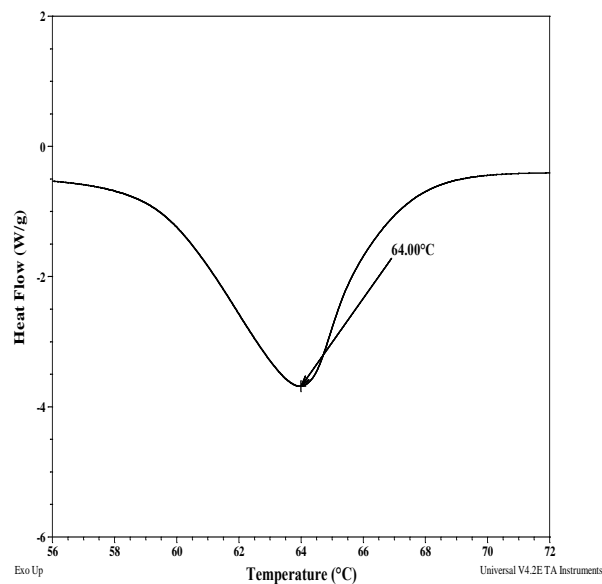
Thermal analysis results at a glance

Sample	T_m (°C)	T_c (°C)	T_g (°C)
CL2COOH	64	32	-69

Thermogram for the sample



Melting curve for the polymer:



Crystallization curve for the polymer:

