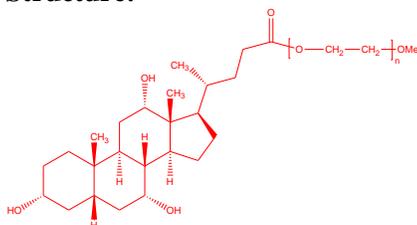


**Sample Name:** Cholic acid-end functionalized with Poly (ethylene glycol) methyl ether

**Sample #:** P12010- EGOCH3-CA

**Structure:**



**Composition:**

$M_n \times 10^{-3}$ (PEG)	PDI
1.1	1.09
Functionality	32%

**Synthesis Procedure:**

Esterification of the carboxylic group of cholic acid (CA) was carried out by a reaction between the COOH group of the CA and the terminal OH group of the methoxy PEG in THF solvent using selected catalysts.

**Purification of the obtained polymer:**

The obtained polymer was purified by a rigorous treatment to remove residual catalyst and side products as described below:

- i.) The polymer was dissolved in de-ionized distilled water to remove insoluble organic catalyst and side products. Further, dichloromethane was added to water-polymer mixture to extract the polymer. The obtained polymer was dried over anhydrous sodium sulfate.
- ii) Solution filtered; passed through a column packed with basic  $Al_2O_3$  and concentrated on rota-evaporator.
- iii) The concentrated solution precipitated out in cold diethyl ether and vacuum dried for 48h at 38 °C.

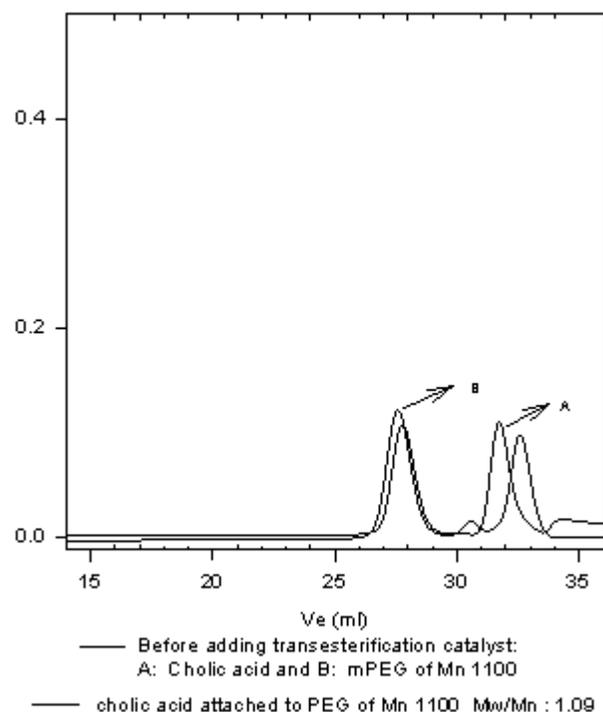
**Characterization:**

The molecular weight and polydispersity index of this polymer were determined by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. Polymer architecture was validated by  $^1H$ NMR

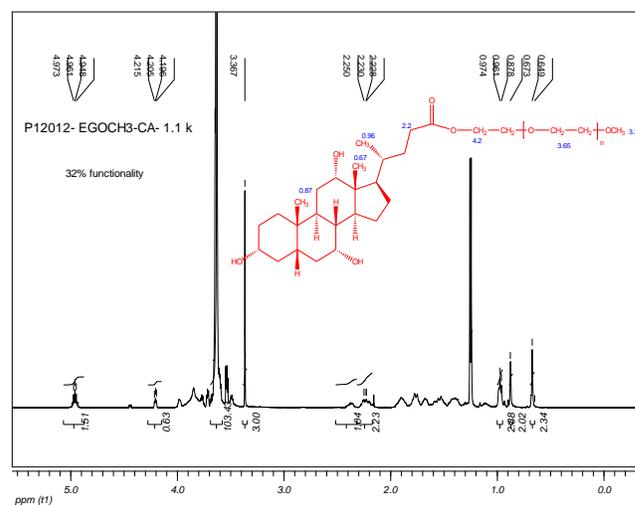
**Solubility:**

Polymer is soluble in, DMSO, THF, toluene, ethanol, methanol and  $CHCl_3$ . It precipitates out from diethyl ether.

**SEC of Sample:**



**$^1H$ NMR of the Polymer:**



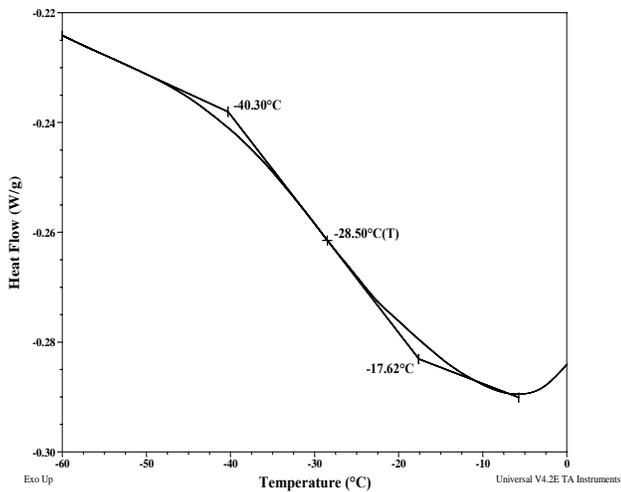
### Thermal analysis of the Sample

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 ( $T_g$ ).

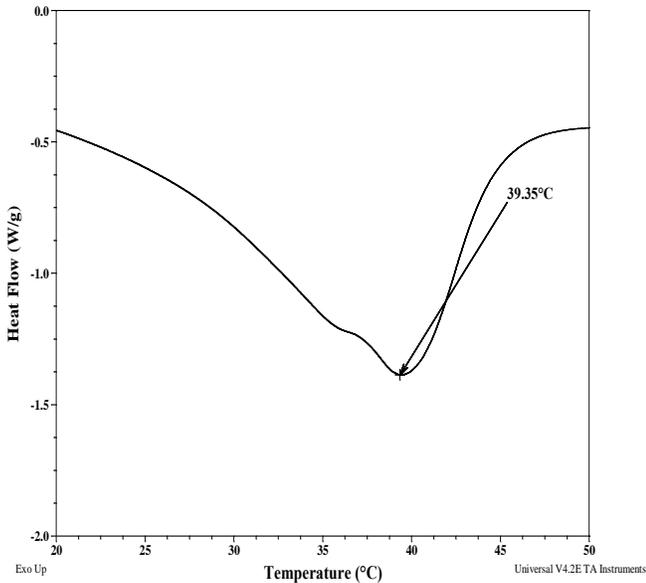
### Melting and crystallization curve for the sample

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.

### Thermogram for EO block:



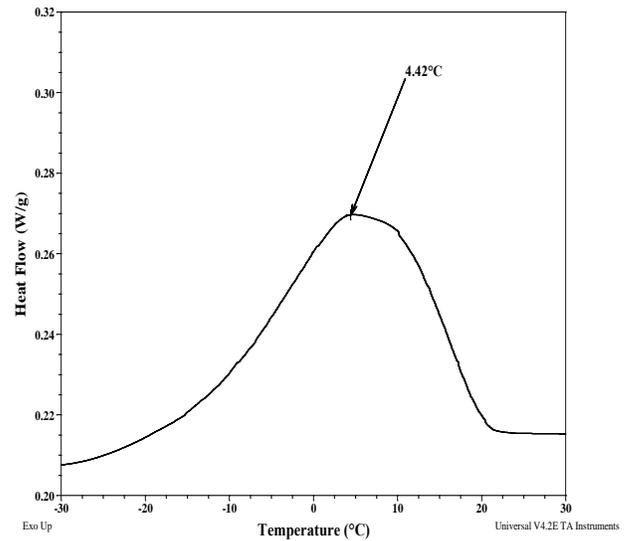
### Melting curve for EO block:



### Thermal analysis results at a glance

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
EO (homopolymer)	38	26	-65
Cholic acid (CA)	62	43	-
EO in EOCH3CA	39	04	-29
CA in EOCH3CA	74	-	-

### Crystallization curve for EO block:



### Melting curve for Cholic acid

