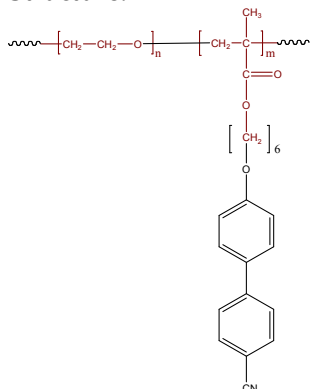


Poly(ethylene oxide-*b*-6-(4'-cyanobiphenyl-4-yloxy)hexyl methacrylate

Sample #: *P9497-EO4CNBPHMA*

Structure:

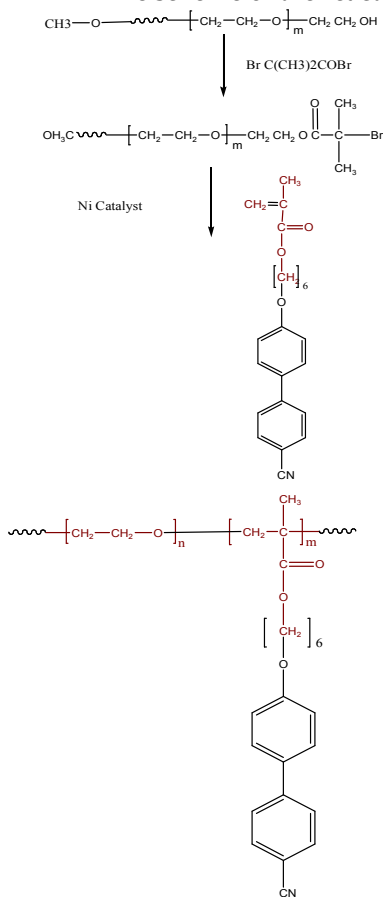


Composition:

| | |
|--|------|
| Mn x 10 ³ PEO-b-4CNBPHMA | PDI |
| 6.7-b-4.0 | 1.25 |

Synthesis Procedure:

The scheme of the reactions is illustrated below:



Purification of the polymer:

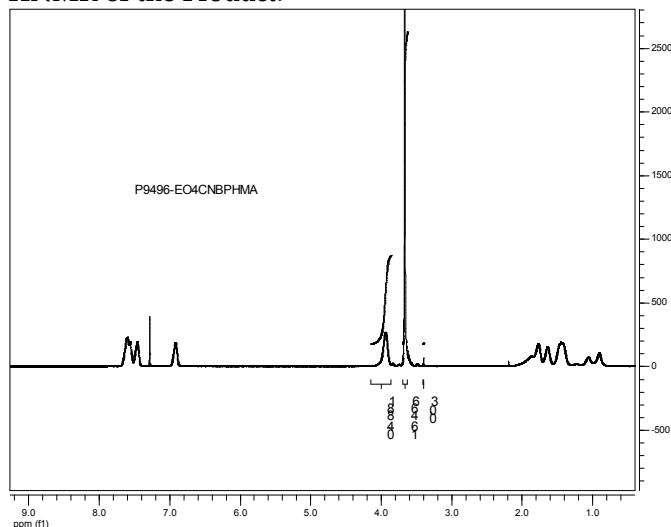
The un-reacted PEG can be removed by stirring the polymer in hot water. The obtained polymer dissolved in CHCl_3 /Toluene and pass through the column packed with silica. The Diblock copolymer obtained through the 2nd route where the macroinitiator of PEG bearing Br terminal group was used to initiate polymerization of 4-cyanobiphenyl-4-yloxy hexyl methacrylate. The

obtained polymer solution in toluene/ CHCl_3 was passed through a column packed with silica to remove the traces amount of Nickel catalyst. The polymer was further purified by stirring in hot water to remove unreacted PEG macroinitiator. The polymer was recovered by precipitation in cold ether/hexane mixture.

Solubility:

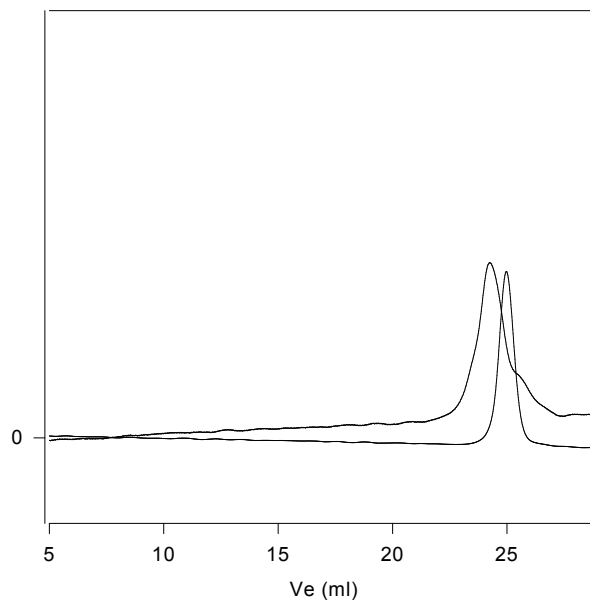
Polymer is soluble in CHCl_3 , THF and toluene. The polymer precipitated out from hexane.

HNMR of the Product:



SEC of the block copolymer:

P9497-EO4CNBPHMA



Size exclusion chromatography of the product:

— Poly(ethylene oxide), $M_n=6700$, $M_w=7000$, $PI=1.05$

— Block Copolymer PEO(6700)-b-4-CNBPHMA (4000), PI=1.25

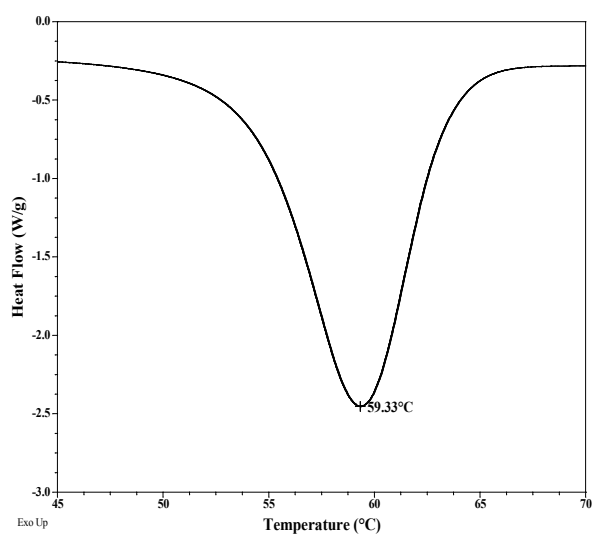
Thermal analysis of the P9497- EO4CNBPHMA

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).

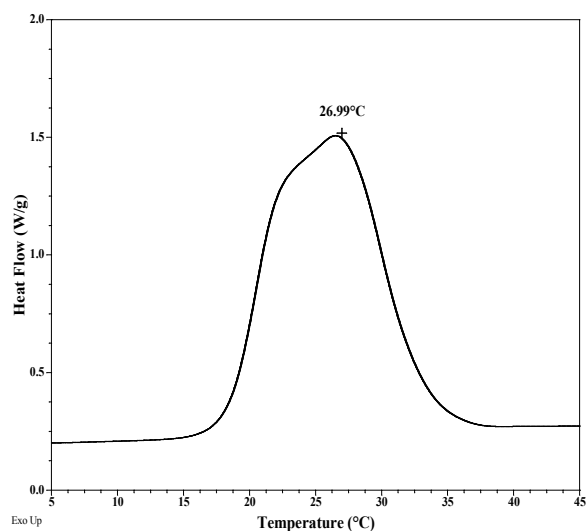
Melting and crystallization curve for the sample

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.

Melting curve for PEO block



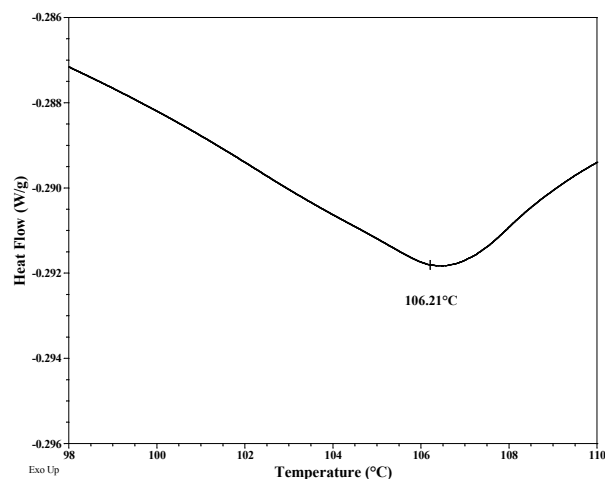
Crystallization curve for PEO block:



Typical thermal analysis results at a glance:

| Sample | T_m (°C) | T_c (°C) | T_g (°C) |
|----------|------------|------------|------------|
| EO | 59 | 27 | - |
| 4CNBPHMA | 106 | 99 | - |

Melting curve for 4CNBPHMA block:



Crystallization curve for 4CNBPHMA block

