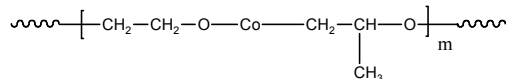


**Sample Name:** Random copolymer of Poly(ethylene oxide-co-propylene oxide)

**Sample #:** P5380-EOPOran

**Structure:**



**Composition:**

$M_n \times 10^3$	PDI
109.00	1.25
EO:	79 mole%

**Synthesis Procedure:**

Random copolymer of Poly(ethylene oxide) and poly(propylene oxide) is prepared by living anionic polymerization with a mixture of monomer using aluminum based adduct.

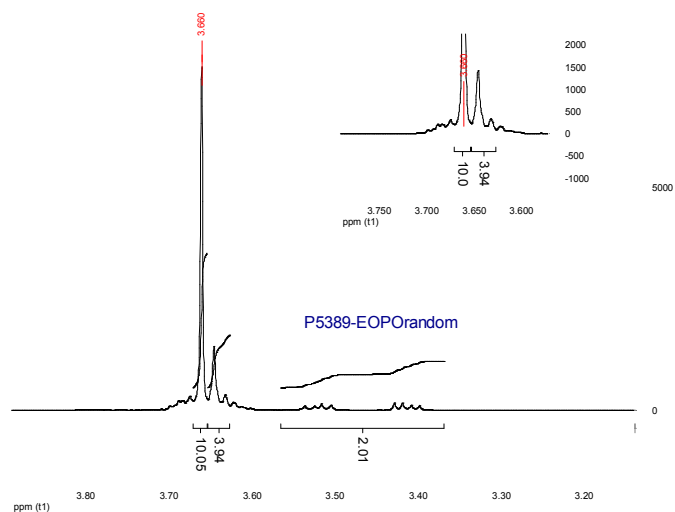
**Characterization:**

The polymer was 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 propylene oxide protons  $\text{CH}(\text{CH}_3)$  at about 1.08 ppm.

**Solubility:**

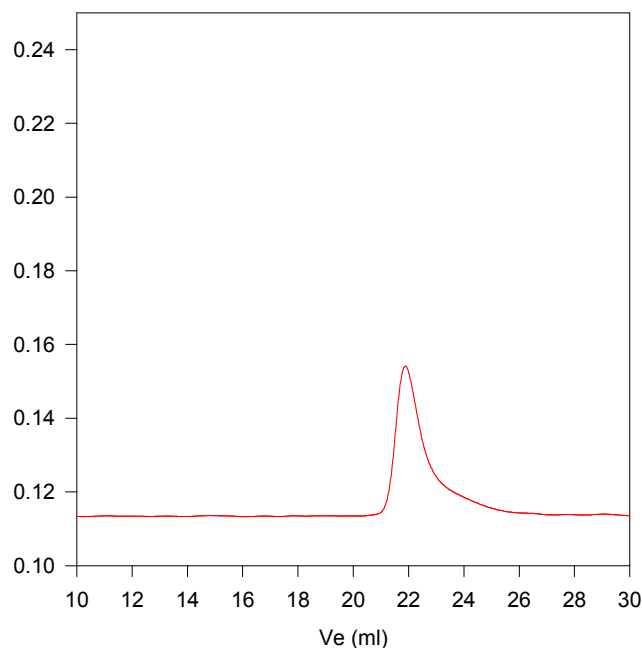
Polymer is soluble in  $\text{CHCl}_3$ , THF, methanol and ethanol. The polymer is precipitated out from hexane and ether if PEO chain is long enough.

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



**SEC of the copolymer:**

**P5380-EOPOran**



Size exclusion chromatograph of the polymer:

$M_n = 109,000$ ,  $M_w = 136,000$ ,  $M_w/M_n = 1.25$

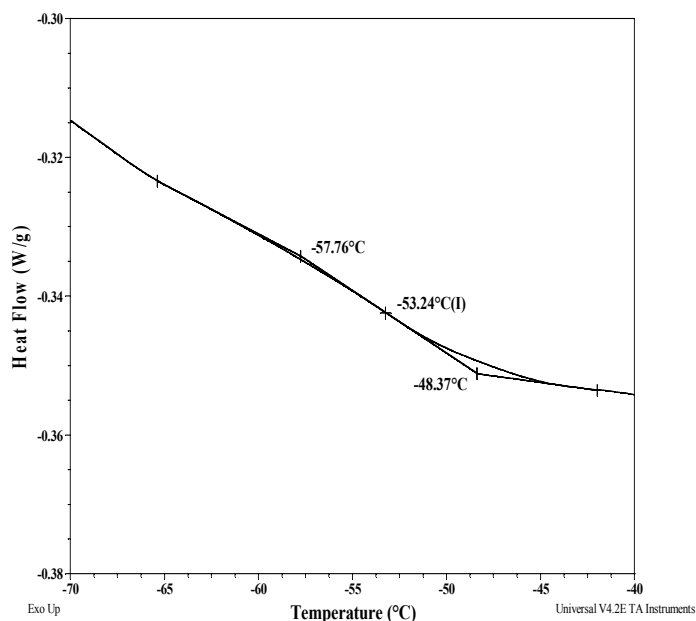
EO = 79.0 mole% from NMR

## Thermal Analysis of the random polymer and comparison with diblock polymer

### Thermal analysis of the sample# P5380-EOPOran

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 ( $T_g$ ).

### Thermogram for PO block



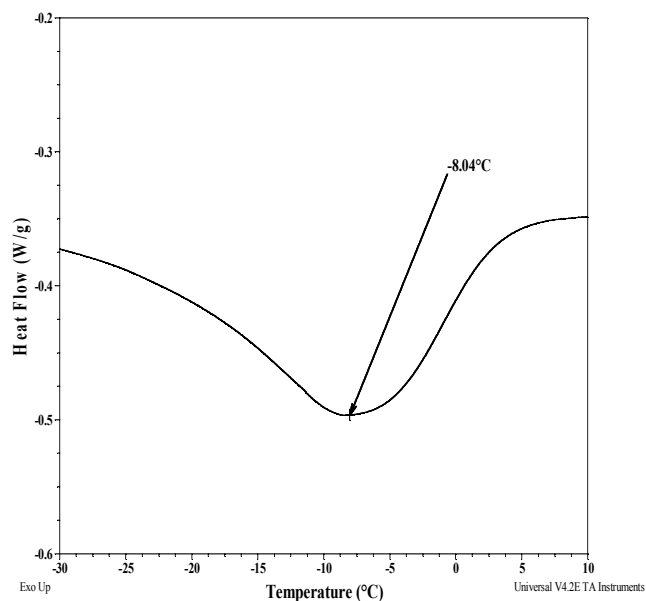
### Melting and crystallization curve for the sample

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.

## Comparative thermal analysis data between block & random polymer based on EO & PO

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
Block (P5374 EOPO; 101-b-20.5)	61	40	-70
Random	-08	-47	-53

### Melting curve for EO block:



### Crystallization curve for EO block:

