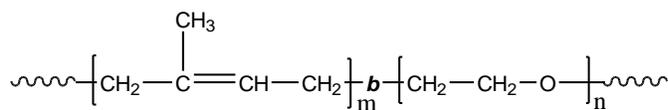


Sample Name:

**Poly(1,4-isoprene)-b-poly(ethylene oxide)**

Sample #: **P6203-IPEO**

Structure:



Composition:

$M_n \times 10^3$ PIP-b-EO	$M_w/M_n$ (PDI)
26.0-b-14.5	1.05

Synthesis Procedure:

Poly(Isoprene 1,4 addition or 1,2 addition)-b-ethylene oxide) can be prepared by the different routes as reported in the literature (Ref: *Macromolecules* 1996, 29, 6994). The direct synthesis of diblock copolymer using lithium counter ion in the presence of **Phosphazene Base**  $t\text{-BuP}_4$  is interesting as reported in *Macromolecules*, **32** (8), 2783 -2785, 1999. These polymers can also be successfully synthesized using different end functionalized polymers as investigated in our laboratory which are proprietary.

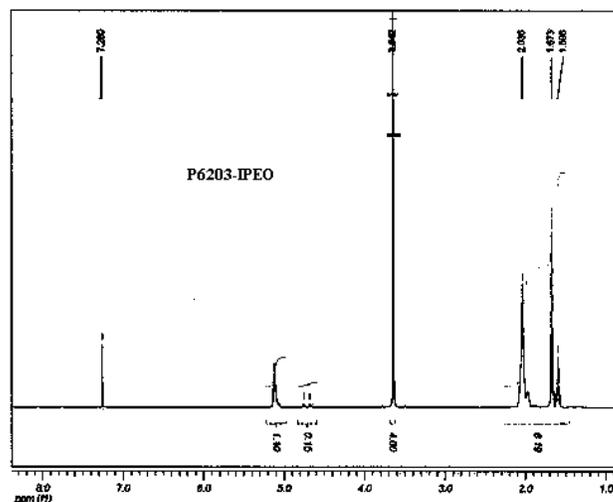
Characterization:

OH terminated isoprene 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 vinylic butadiene protons at about 5.4 ppm with the ethylene oxide protons at 3.6 ppm. Block copolymer PDI is determined by SEC.

Solubility:

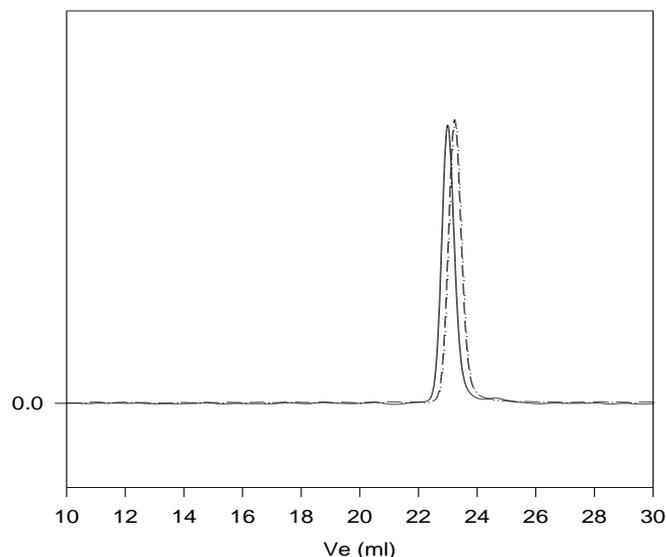
Poly(isoprene-b-ethylene oxide) is soluble in THF,  $\text{CHCl}_3$ , and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

$^1\text{H}$  NMR spectrum of the sample:



SEC profile of the block copolymer:

**P6203-IpEO**



Size exclusion chromatography of poly(isoprene-b-ethylene oxide)

--- PIP,  $M_n=26000$ ,  $M_w=27300$ ,  $M_w/M_n=1.05$

— Poly(isoprene-b-ethylene oxide)

$M_n$ : PIP(26000)-b-PEO(14500)  $M_w/M_n=1.05$

## Thermal analysis of the sample# P6203-IPEO

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 ( $T_g$ ).

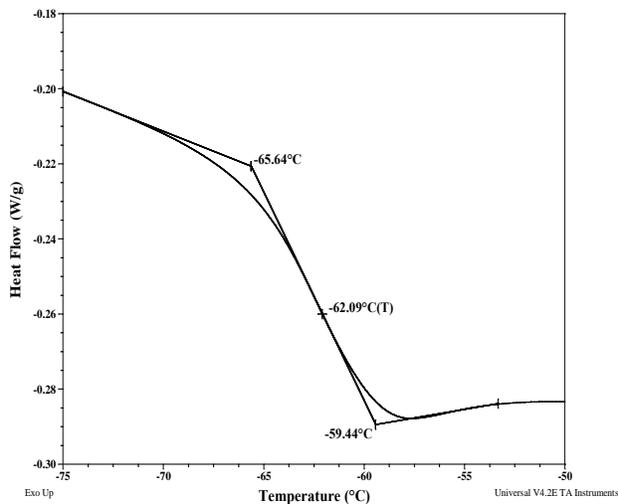
### Melting and crystallization curve for the sample

The melting temperature ( $T_m$ ) was taken as the maximum of the endothermic peak whereas the crystallization temperature ( $T_c$ ) was considered as the minimum of the exothermic peak.

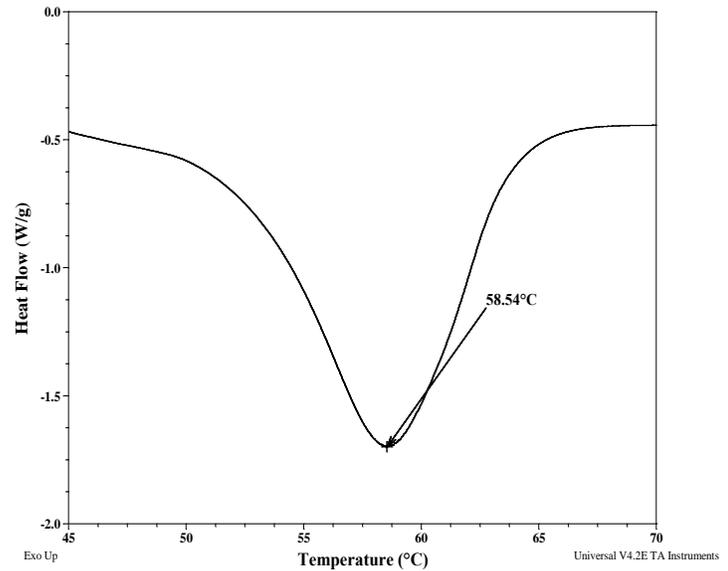
### Thermal analysis results at a glance

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
EO	59	38	-
Ip	-	-	-62

### Thermogram for the sample



### Melting curve for PEO block:



### Crystallization curve for PEO block:

