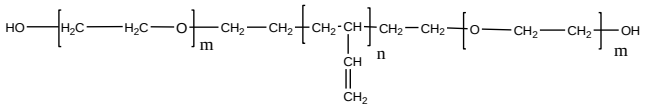
Sample Name:

Poly (ethylene oxide(or glycol)-b-butadiene-b- ethylene oxide (glycol)

Polybutadiene, 1,2-rich microstructure

Sample #: P9493A-EOBdEO

Structure:



Composition:

Mn x 10^3	PDI	**1,2 addition**
4.3-b-0.8-b-4.3	1.04	>85%

Synthesis Procedure:

1,2-rich microstructure addition dihydroxy terminated polybutadiene was prepared by anionic living polymerization (by lithium naphthalene) of butadiene in polar solvent such as THF at 0 ^oC followed by termination with ethylene oxide and than growing PEO block from its potassium salt.

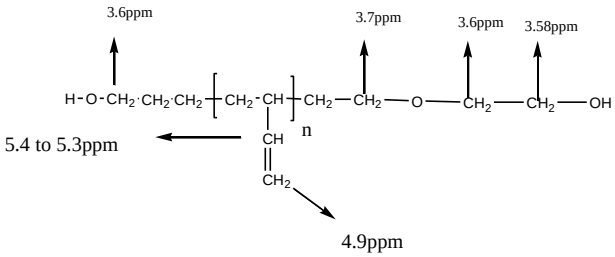
Characterization:

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

Solubility:

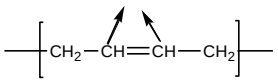
Polymer is soluble in THF, toluene, cyclohexane and $CHCl_3$. It precipitates from methanol, ethanol and water.

HNMR of the Product:

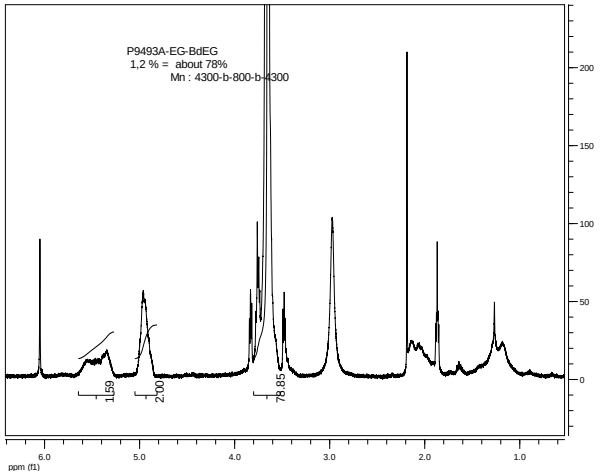


Chemical Shifts

5.0 to 5.3 ppm

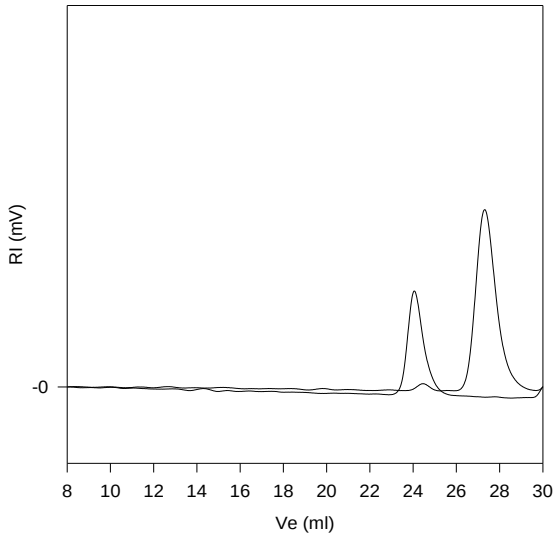


1,4 fractions in 1,2 microstructure



SEC of Sample:

P9493A-EOBdEO (rich in 1,2 addition)



Size Exclusion Chromatography of polystyrene;

—— M_n = 800, M_w =850, M_w/M_n = 1.04

EOBDEO: Mn 4300-b-800-b-4300 Mw/Mn 1.03

Thermal analysis of the P9493A-EOBdEO

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).

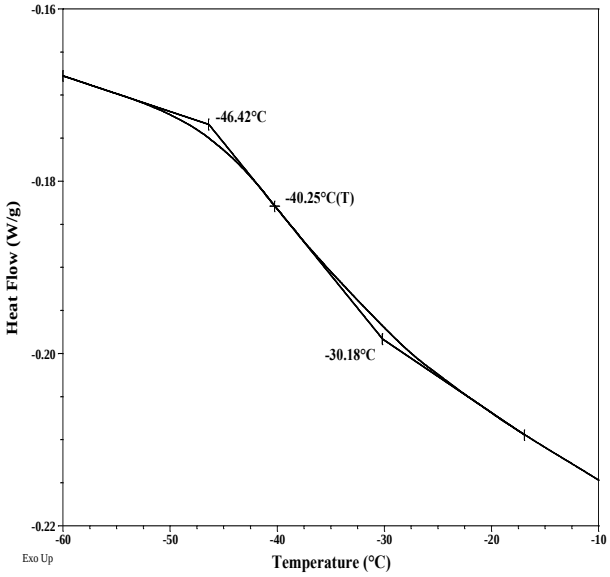
Melting and crystallization curve for the sample

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.

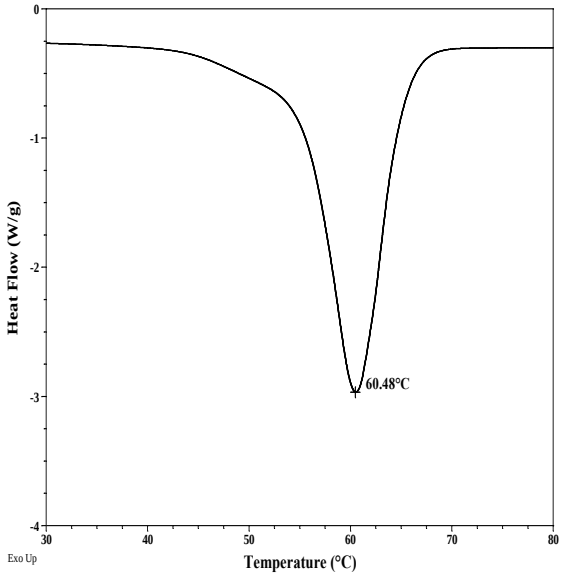
Thermal analysis results at a glance

Sample	T_m (°C)	T_c (°C)	T_g (°C)
PBd block	-	-	-
PEO block	60	38	-40

Glass transition of PEO block:



Melting curve for PEO block



Crystallization curve for PEO block: