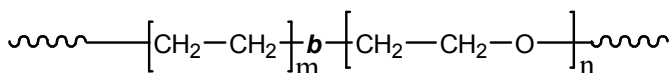


Sample Name: Poly(ethylene-b-ethylene oxide)
Polybutadiene rich in 1,2 or 1,4 microstructure

Sample #: P8255A-EEO
(polybutadiene block rich in 1,4 microstructure)

1,4-rich microstructure:



Composition:

Mn x 10 ³	Mw/Mn (PDI)
E-b-EO	
61.0-20.0	1.05

Synthesis Procedure:

Poly(butadiene(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-BuP₄** is interesting as reported in *Macromolecules*, **32** (8), 2783 -2785, 1999. These polymers can also be successfully synthesized using the different end functionalized polymers as investigated in our lab. These methodologies are proprietary.

Characterization:

OH terminated polybutadiene was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-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(butadiene-b-ethylene oxide) is soluble in THF, CHCl₃, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

Product was hydrogenated in the presence of Wilkinson catalyst under 400psi of hydrogen.

Product after filtration a few times by dissolving in Benzene at 65°C. The product still bears the coloration. This color from the polymer cannot be removed. The product in hot toluene, benzene is clear with light coloration.

Figure: ¹H NMR spectrum of the sample

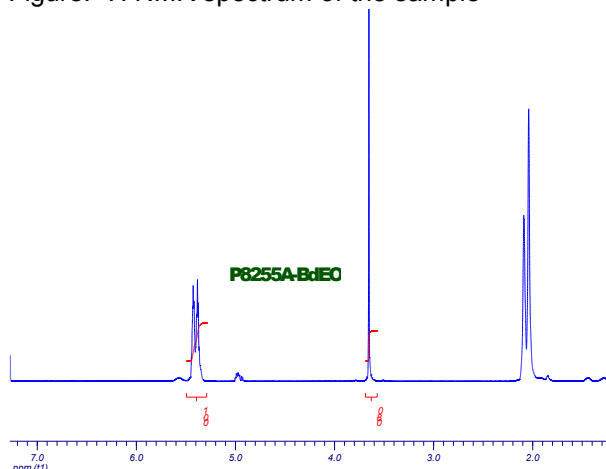
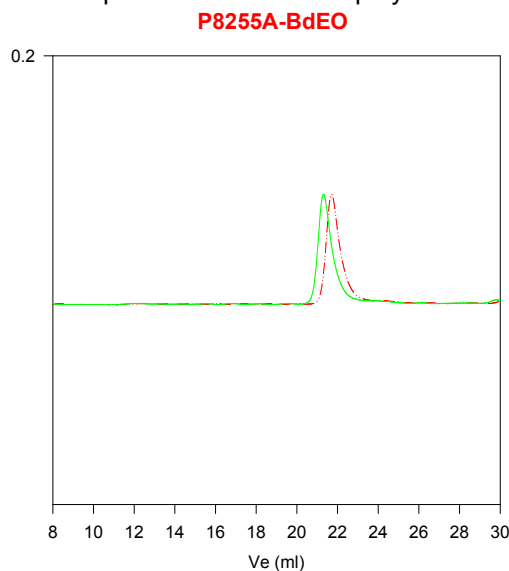


Figure: SEC profile of the block copolymer



Size exclusion chromatography of poly(butadiene-b-ethylene oxide):

- 1,4 polybutadiene M_n=61000, M_w=63500, PI=1.04
 - Block Copolymer PBd(61000)-b-PEO(20000), PI=1.05
- Composition from ¹H NMR. After Hydrogenation:
 PE-b-EO: 63000-b-20000