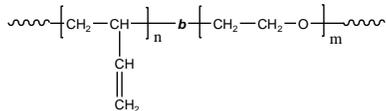


Sample Name: Poly (butadiene-b-ethylene oxide)

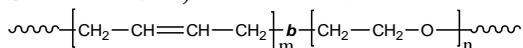
Sample #: P10946A-BdEO

Poly butadiene block rich in 1,2 microstructure

Structure of 1,2-rich microstructure about 95%:



Structure of 1,4-rich microstructure:



Composition:

Mn x 10 ³ Bd-b-EO	Mw/Mn (PDI)	% 1,2 addition Butadiene
4.0-b-2.0	1.12	95%
Dp: of each block: 74-b-45		

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.

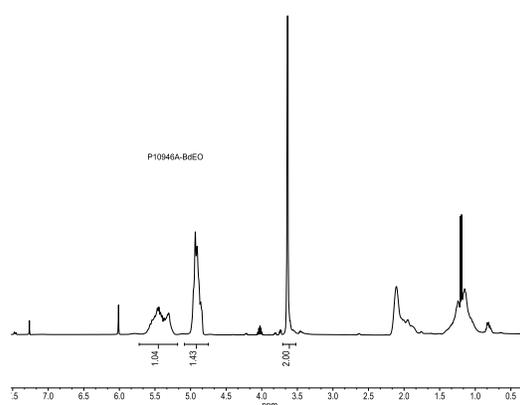
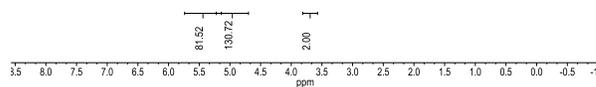
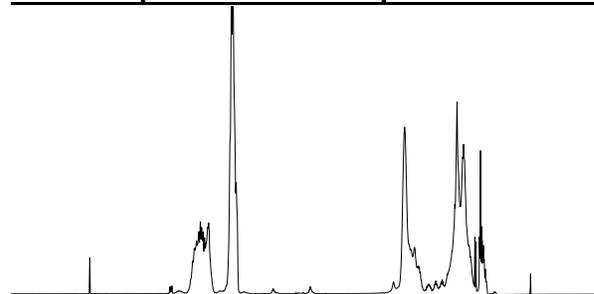
Characterization:

OH terminated polybutadiene 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 ¹H-NMR spectroscopy by comparing the peak area of the vinylic butadiene protons between about 5.0-5.4 ppm with the ethylene oxide protons at 3.6 ppm. Block copolymer PDI is determined by SEC. **Note:** The ¹H-NMR of 1,2-polybutadiene is composed of 1 proton signal at 5.4 ppm and 2 proton signals at 5.0 ppm. Signals due to vinylic 1,4-polybutadiene are also present at 5.4 ppm.

Solubility:

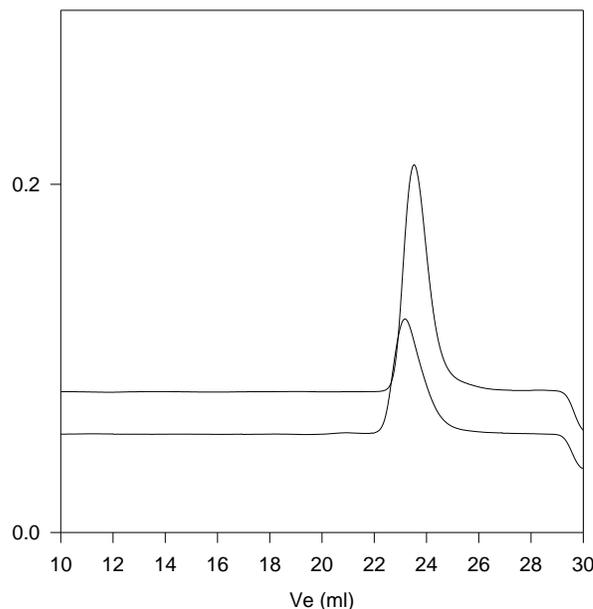
Poly (butadiene-b-ethylene oxide) is soluble in THF, CHCl₃, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.

¹H NMR spectrum of the sample BdOH terminated



SEC profile of the block copolymer

P10946A-BdEO



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

- 1,2 polybutadiene M_n=4000, M_w=4200, PI=1.05
- - - Block Copolymer PBd(4,000)-b-PEO(2,000), PI=1.12
Composition from H NMR