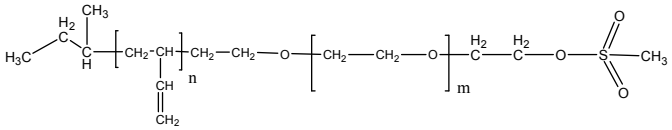
Sample Name: **Mesylate terminated Poly(butadiene-b-ethylene oxide)**

Poly butadiene rich in 1,2 or 1,4 microstructure

Sample #: **P10809-BdEOMesylate**

(poly butadiene block rich in 1,2 microstructure)

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



Composition:

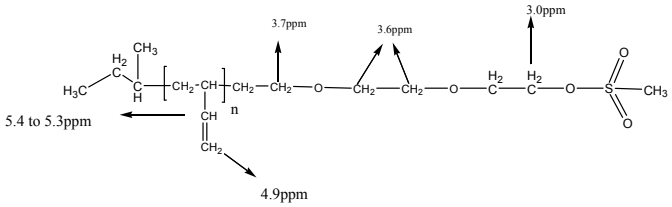
Mn x 10^3 Bd-b-EO	Mw/Mn (PDI)	% 1,2 addition Butadiene
2.5-b-1.3	1.09	95%

Synthesis Procedure: Poly(butadiene(1,4 addtion 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*-**BuP_4 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. Terminal OH modified to mesylate group.

Characterization: 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}H-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 ^{1}H-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.

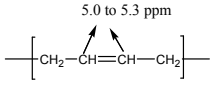
Solubility:

Polymer is soluble in THF, $CHCl_3$, and toluene. The polymer has variable solubility in hexane, methanol, ethanol and water depending on its composition.



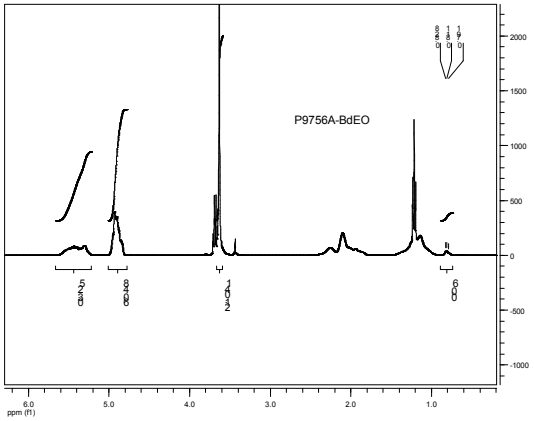
Chemical Shifts

5.0 to 5.3 ppm

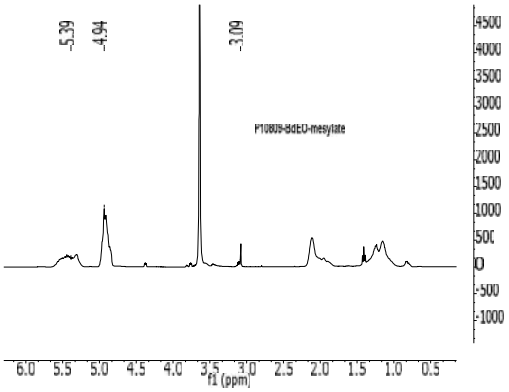


1,4 fractions in 1,2 microstructure

^{1}H NMR spectrum of the sample BdOH terminated

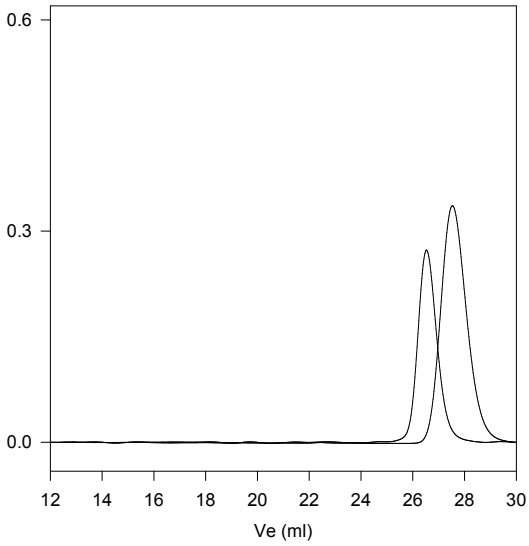


H NMR spectrum of the sample (precursor)



SEC Profile:

P10809-BdEO mesylate



Size Exclusion Chromatogram of Poly(butadiene-b-ethylene oxide)

—— Polybutadiene: M_n=2500, M_w=2700, M_w/M_n=1.07

—— PBd-b-PEO: M_n PBd(2500)-PEO(1300), M_w/M_n=1.07

The Mn of PEO is calculated from NMR results,