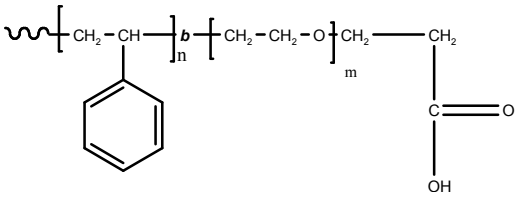
Sample Name: **Carboxylic acid terminated Poly(styrene-b-ethylene oxide)**

Sample #: **P9051-SEOCOOH**

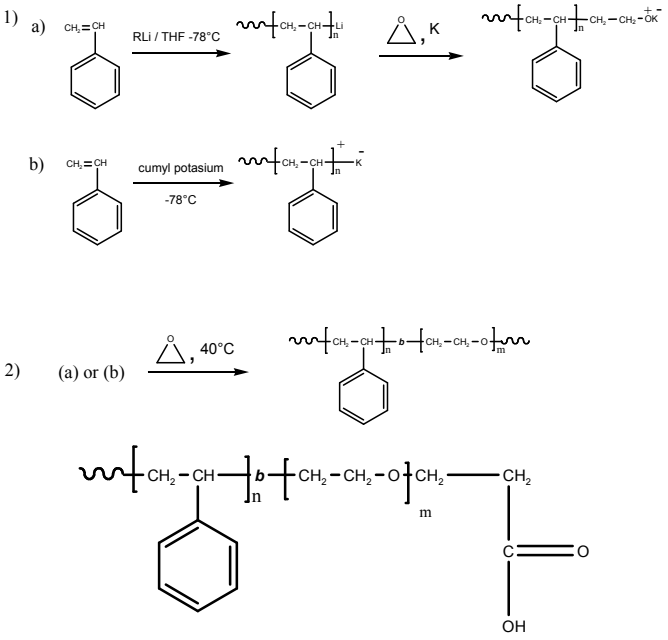
Structure:



Composition:

Mn x 10^3 S-b-EO	PDI	COOH Functionality
1.7-b-0.6	1.09	>98%

Synthesis Procedure:
Poly(styrene-b-ethylene oxide) diblock copolymer is prepared by living anionic polymerization. Following are the 2 possible routes that were used to synthesize SEO. The scheme of the reaction is illustrated below: The obtained polymer chains bear a terminal OH group that reacted with tert.butyl acrylate in the presence of appropriate solvent than the tert.butyl ester terminal converted to free COOH group.

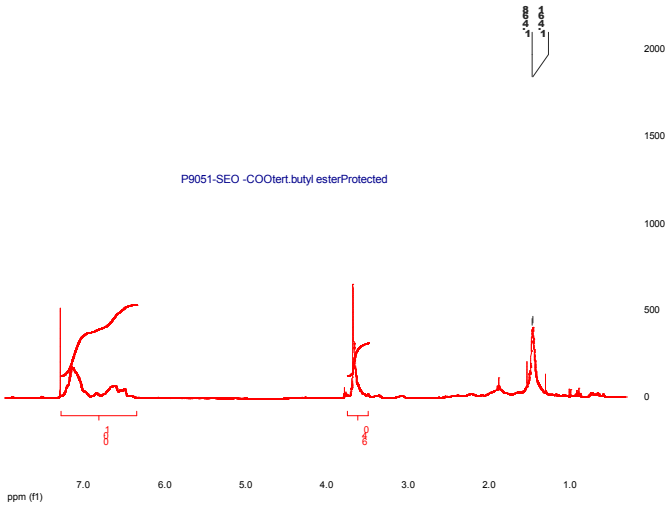


Characterization:

The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from ^{1}H-NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm and the ethylene oxide protons at 3.65 ppm.

Solubility: The polymer is soluble in THF (at 35 °C), $CHCl_3$, benzene, toluene, dioxane. Low molecular weight SEO with high contents of the polyethylene oxide block can also be solubilized in methanol and water.

Figure: ^{1}H NMR spectrum of the sample at different stages:



HNMR in PSEOCOOH

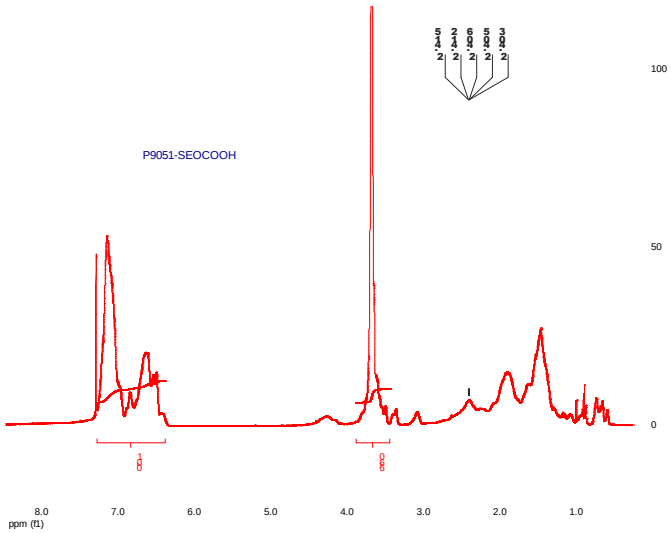
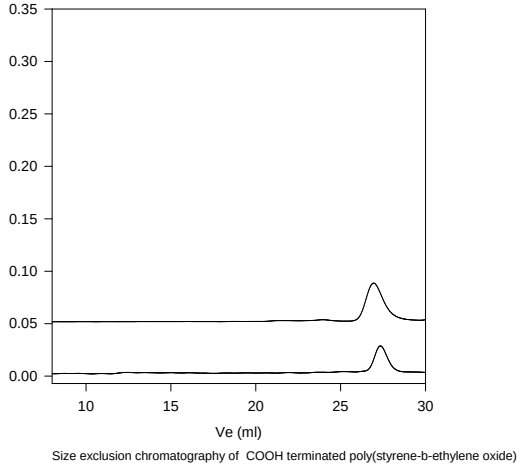


Figure: SEC profile of the block copolymer
P9051-SEOCOOH



Size exclusion chromatography of COOH terminated poly(styrene-b-ethylene oxide)

—— Poly(styrene), M_n=1700, M_w=1900, PI=1.14
—— Block Copolymer PSt(1700)-b-PEO(600), PI=1.09
Composition from ^{H} NMR