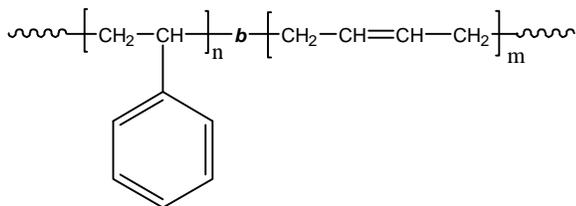


Sample Name: Poly(Styrene-*b*-1,4-Butadiene)

Sample # P958-SBd

Structure:

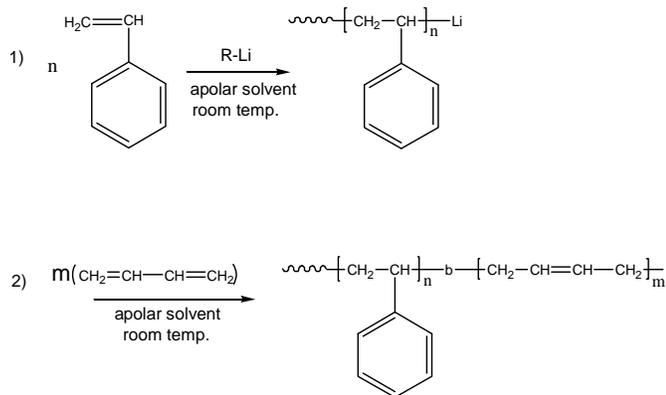


Composition:

Mn x 10 ³ S-b-Bd (k)	M _w /M _n (PDI)
66.9–b–75.0	1.08

Synthesis procedure:

Poly(styrene-*b*-butadiene [rich in 1,4-addition]) was prepared by living anionic polymerization with sequence addition of styrene followed by butadiene (Bd) in a non-polar solvent such as cyclohexane, benzene or toluene. The scheme of the polymerization reaction is presented below:



Characterization:

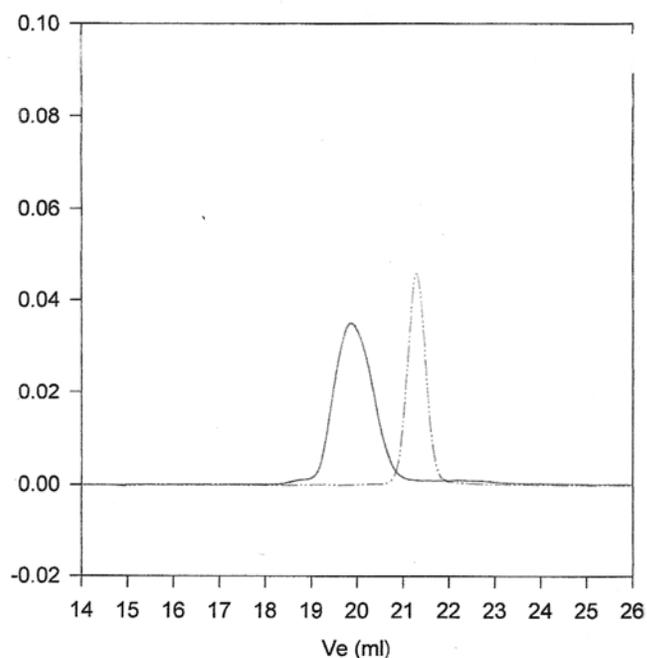
An aliquot of the anionic polystyrene block was terminated before addition of butadiene and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI).

The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the polybutadiene protons (double bond 4.9–5.6 ppm) with the aromatic protons of polystyrene at 6.3–7.2 ppm. ¹H-NMR spectroscopy shows that the copolymer contains mostly 1,4-addition butadiene microstructure (> 90%) (appr. 5.3–5.7 ppm) with a small contribution from 1,2-addition butadiene (appr. 5.0 ppm). PDI of the diblock copolymer was determined by SEC.

Solubility:

Poly(styrene-*b*-butadiene) is soluble in toluene, cyclohexane, benzene, THF, 1,4-dioxane, and chloroform. The polymer precipitates from methanol, ethanol, and water.

SEC elugrams of P958-SBd:



Size exclusion chromatography of poly (styrene-*b*-butadiene)

- Polystyrene, M_n=66900, M_w=69500, PI=1.04
- Block Copolymer PS(66900)-*b*-PBd(75000), PI=1.08