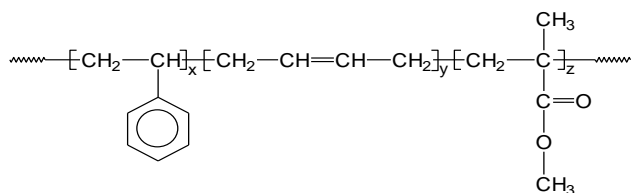


Sample Name:

Poly(styrene-b-butadiene (rich in 1,4 addition)-b-methylmethacrylate)

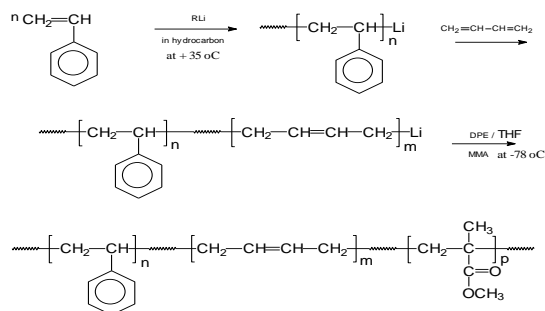
Sample #: P8941-SBdMMA

Structure:**Composition:**

Mn x 10 ³ S-b-Bd-b-MMA	PDI
40.0-b-16.0-b-155.0	1.18
T _g for MMA block: 131°C	T _g for BD block: -54°C

Synthesis Procedure:

The polymer is synthesized by living anionic polymerization with sequence addition of styrene, butadiene (Bd), and then methyl methacrylate (MMA). The scheme of the reaction is illustrated below:

**Characterization:**

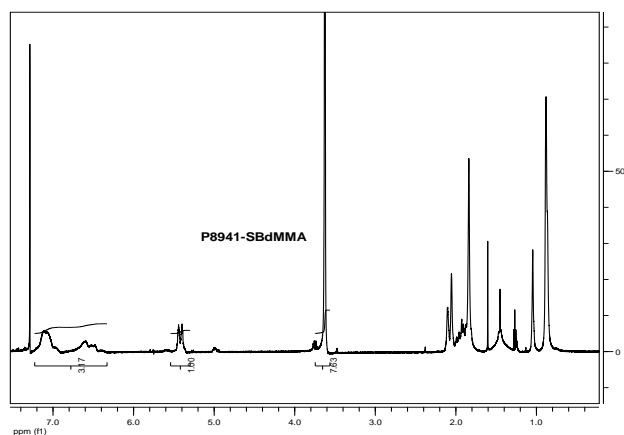
1st Block: The first block was characterized by Size exclusion chromatography (SEC). A Varian liquid chromatograph equipped with UV and refractive detector was used along with Supelco SEC columns. THF was used as an eluent. The columns were calibrated with monodisperse polystyrene. The molecular weights and the polydispersity index were calculated.

2nd and 3rd Block: The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using CDCl₃ as solvent. The molecular weights of 2nd and 3rd block were calculated based on the molecular weight of other blocks and the chemical composition. The polydispersity index of block copolymer was obtained by SEC as described above.

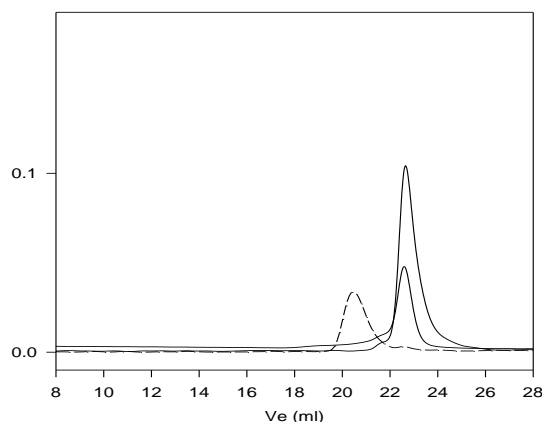
Thermal analysis: Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Polymer is soluble in THF, toluene, and CHCl₃. The polymer readily precipitates from hexanes, ether and water.

¹H-NMR Spectrum of the product**SEC of the polymer:**

P8941-SBd_(rich in 1,4 addition)MMA



Size exclusion chromatography of polystyrene-b-butadiene (1,4 rich addition)-b-methylmethacrylate)

- Poly styrene, M_n=40000, M_w=42000, PI=1.05
- Second block Poly(styrene-b- polybutadiene):PS(40000)-b-PBd(16000), PI=1.08
- - - Final Triblock copolymer: PS(40000)-b-PBd(16000)-b-PMMA(155000), PI=1.18

DSC thermograms: