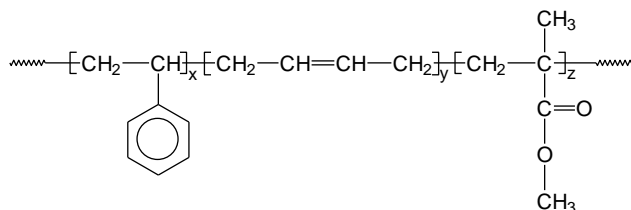


Sample Name:

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

Sample #: P8925-SBdMMA

Structure:

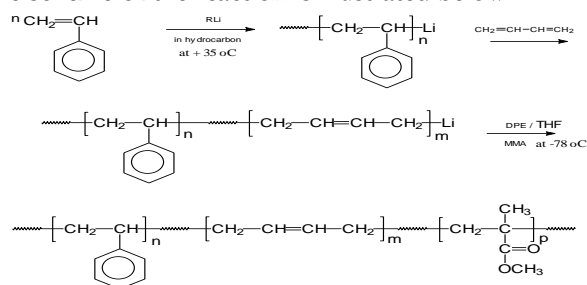


Composition:

Mn x 10 ³	PDI	
S-b-Bd-b-MMA		
39.0-b-8.0-b-283.0	1.3	
T _g for PS block	T _g for Bd block	T _g for MMA block
Not found	Not found	131°C

Synthesis Procedure:

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



Characterization:

First Block: Size exclusion chromatography (SEC): Varian liquid chromatograph equipped with UV and refractive detector. SEC columns from Supelco were used with THF as the eluent. The columns were calibrated with monodisperse polystyrene. The molecular weights and the polydispersity index were calculated.

Second and Third Block: The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using CDCl₃ as solvent. The molecular weights of second and third 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.

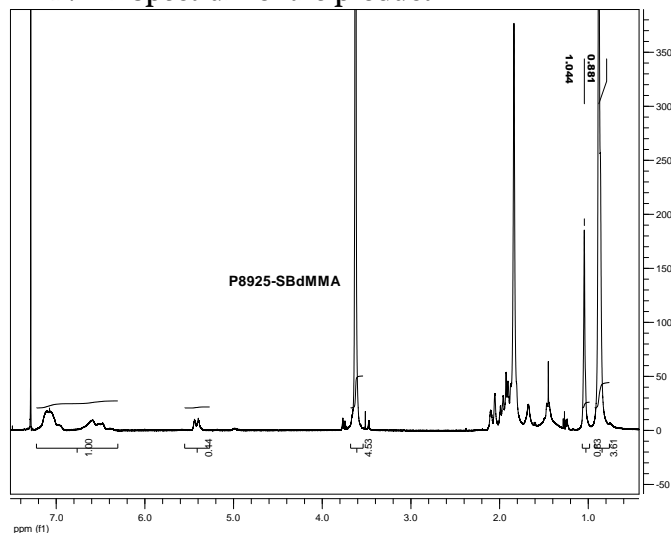
Thermal analysis:

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:

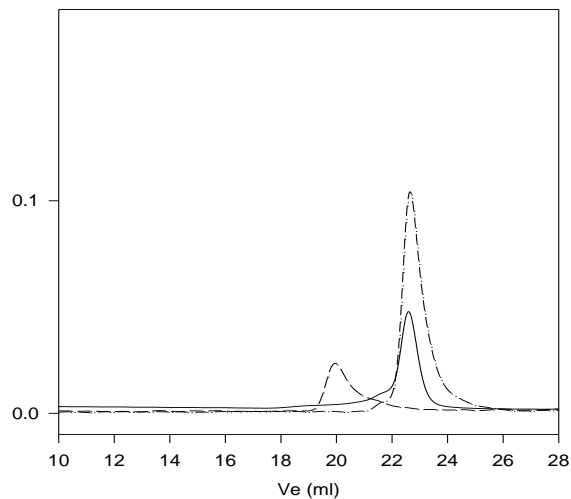
Polymer is soluble in THF, toluene, and CHCl₃. The polymer readily precipitates from hexanes, ether and water.

¹H-NMR Spectrum of the product



SEC for the polymer:

P8925-SBd_(rich in 1,4 addition)MMA



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

- Poly styrene, M_n=39000, M_w=41500, PI=1.06
 - Second block Poly(styrene-*b*- polybutadiene):PS(39000)-b-PBd(8000), PI=1.08
 - ... Final Triblock copolymer: PS(39000)-b-PBd(8000)-b-PMMA(283000), PI=1.3
- Composition from ¹H-NMR

DSC thermogram for the MMA block:

