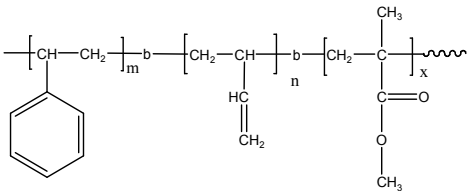
Sample Name:

Poly(styrene-b-butadiene $_{(rich\ in\ 1,2\ addition)}$-b-methylmethacrylate)

Sample #: **P5455-SBdMMA**

Structure:



Composition:

Mn × 10^3 S-b-Bd-b-MMA	PDI	
52.0-b-9.0-175.0	1.13	
T_g for Bd block: -23°C	T_g for PS block: 92°C	T_g for MMA: 133°C
PBd microstructure:	1,2 %: (about 90%)	

***Synthesis Procedure*:**

The triblock polymer is synthesized by living anionic polymerization in THF with sequence addition of styrene, butadiene (Bd), and methyl methacrylate (MMA).

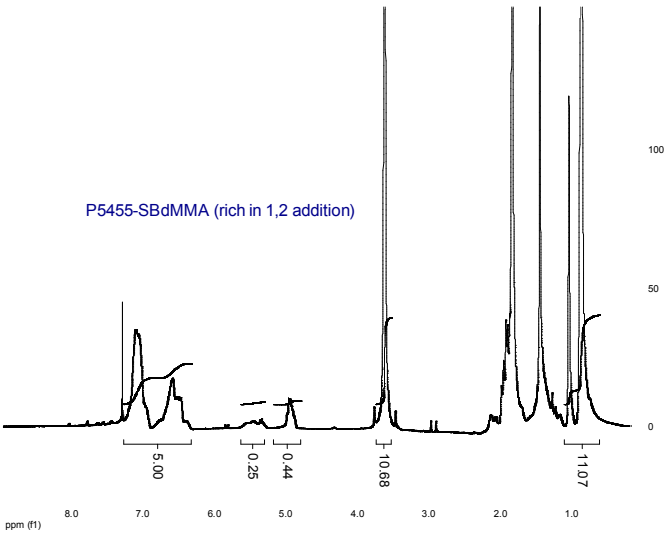
Characterization:

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. The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using $CDCl_3$ as solvent.

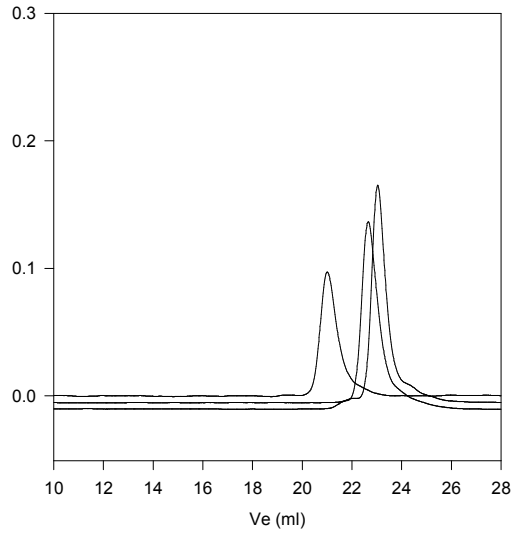
Thermal analysis of the sample:

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).

^{1}H-NMR Spectrum of the product



P5455-SBd(rich 1,2) MMA



Size exclusion chromatography of polystyrene-b-butadiene$_{(1,2\ rich\ addition)}$-b-methylmethacrylate)

First block: Poly styrene, M_n=52,000, PI=1.10

Second block Poly(styrene-b- polybutadiene):PS(52000)-b-PBd(9000), PI=1.10

Final Triblock copolymer: PS(52000)-b-PBd(9000)-b-PMMA(175000), PI=1.13 (1,2 addition > 90%)

Composition from ^{1}HNMR

DSC thermogram for PS, MMA & Bd: