Sample Name:
Poly(Styrene-b-isoprene-b-Methyl methacrylate)

Sample #: P9340-SIpMMA
Structure:
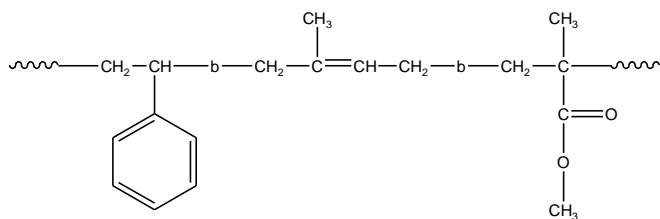
Composition:

Mn x 10^3 S-b-IP-b-MMA	PDI
105.0-b-48.0-b-485.0	1.18
Microstructure for PMMA block Syndio:hetero: :iso	79: 18:4

Synthesis Procedure:

By living anionic polymerization with sequence addition of styrene then isoprene (polymerization in apolar solvent), followed by addition of 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.

Second and Third Block: The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using $CDCl_3$ 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.

Solubility:

Polymer is soluble in THF, toluene, and $CHCl_3$. The polymer readily precipitates from cold hexanes/ethanol mixture. .

^{1}H-NMR Spectrum of the polymer:
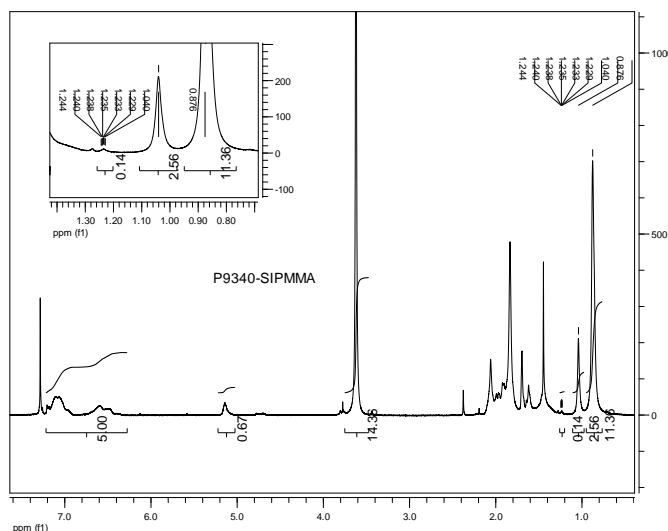
SEC for the polymer:

P9340-SIPMMA
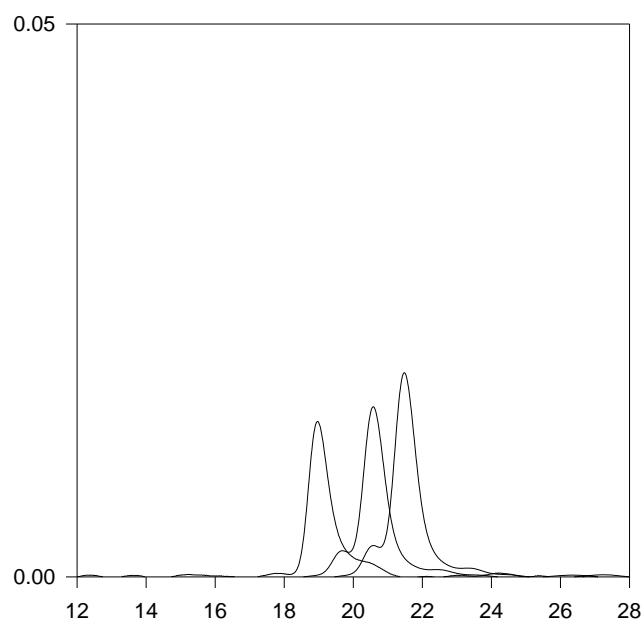
Size Exclusion Chromatography :

—— First PS block, M_n=105000 Mw: 113,000 M_w/M_n=1.08

—— PS-IP, diblock PS(105000)-b-PIP(48000), M_w/M_n=1.14

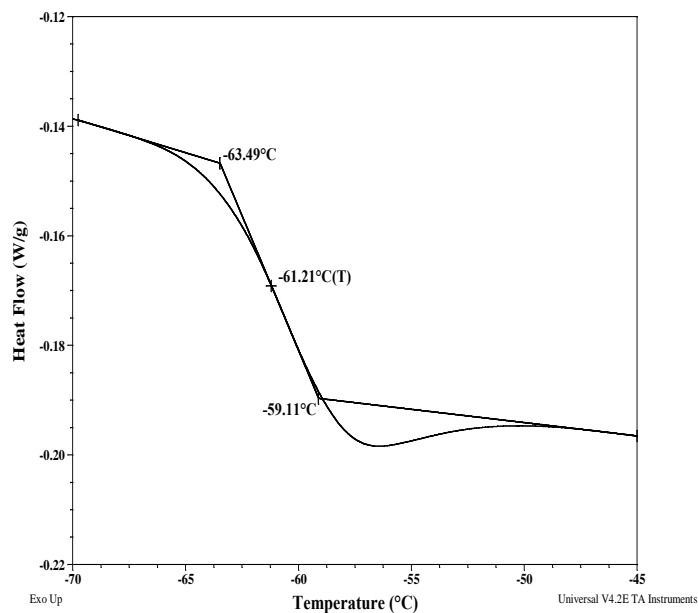—— Triblock PS(58,000)-b-PIP(48,000) -b-PMMA(485,000) M_w/M_n=1.18

Thermal Analysis of sample #: P9340-SIpMMA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^{\circ}C/min$. 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).

Thermal analysis results at a glance

For PS block:	For MMA block:	For PIp block:
T_g: 106ºC	T_g: 124 oC	T_g: -61ºC

DSC thermogram for PIp block:

DSC thermogram for PS block: