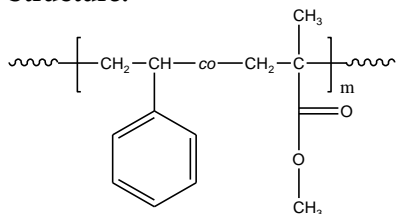


Sample Name:

Random Copolymer Poly(styrene-co-methyl methacrylate)

Sample #: P9222B-SMMAran

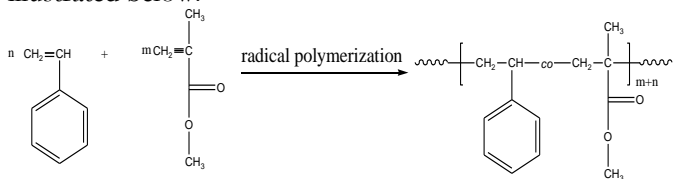
Structure:**Composition:**

Poly styrene: (mol%) : 50.0

$M_n \times 10^3$ PS-co-PMMA	PDI
11.5	1.4
T_g (°C)	88

Synthesis Procedure:

Random Copolymer Poly(styrene-co-methyl methacrylate) is prepared by radical polymerization of styrene and methyl methacrylate. The scheme of the reaction is illustrated below:

**Characterization:**

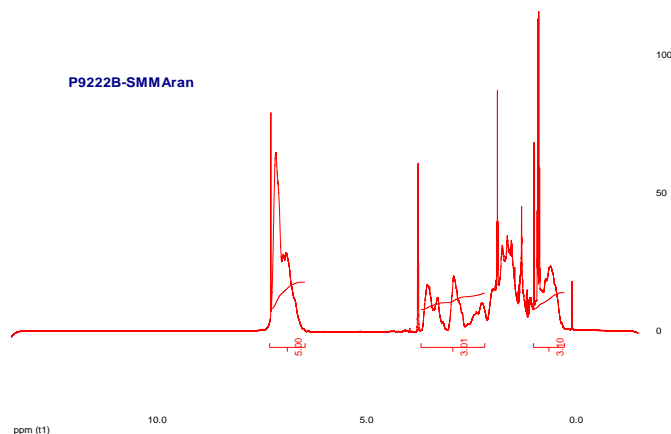
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from $^1\text{H-NMR}$ spectroscopy by comparing the peak area the aromatic protons at 6.66-7.05 ppm with the protons of methyl methacrylate at about 0.8-3.8 ppm that deducts the contribution of the styrene back bone protons.

Thermal analysis:

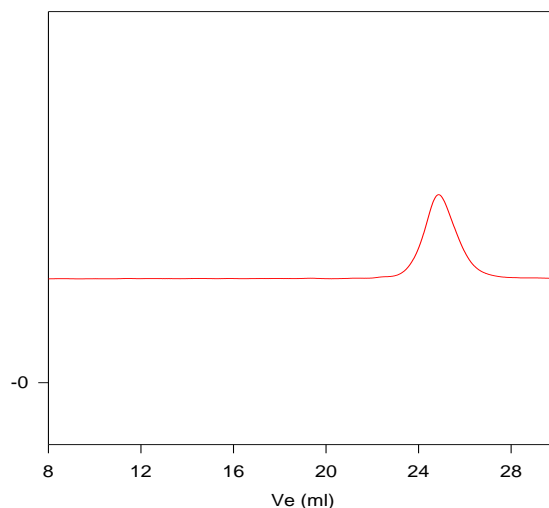
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^\circ\text{C}/\text{min}$. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Random Copolymer Poly(styrene-co-methyl methacrylate) is soluble in CHCl_3 , THF, DMF, toluene and precipitated out from methanol.

 $^1\text{H-NMR}$ Spectrum of the random copolymer:**SEC of the random copolymer:**

P9222B-SMMAran



Size exclusion chromatograph of random copolymer: poly(S-co-MMA):

$M_n=11,500$, $M_w=16,100$, $M_w/M_n=1.4$

Polystyrene content: 50 mole% by NMR

DSC thermogram for random polymer: