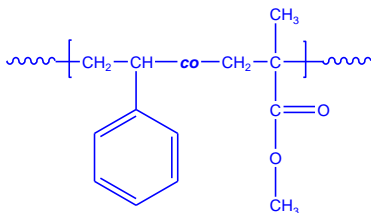


**Sample Name:**

**Random Copolymer Poly(styrene-co-methyl methacrylate)**

**Sample #: P6594-SMMAran**

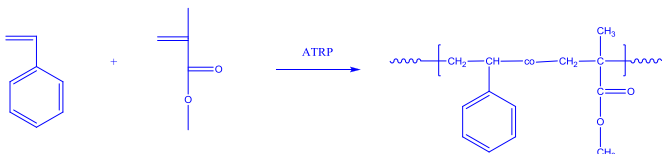
**Structure:****Composition:**

PS (wt.%) : 42.0% (41.2 mol%)

$M_n \times 10^3$ PS-co-PMMA	PDI
24.5	1.24
$T_g$ for random polymer	100°C

**Synthesis Procedure:**

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

**Characterization:**

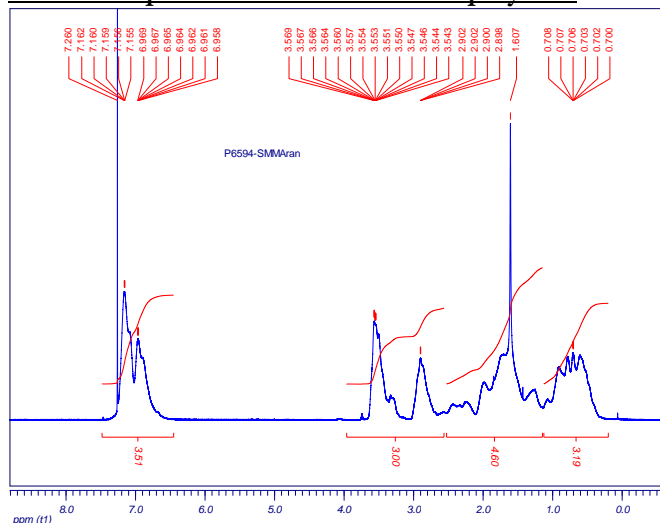
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from  $^1\text{H-NMR}$  spectroscopy by comparing the peak area of the aromatic protons from 6.66 to 7.05 ppm with the protons of methyl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

**Thermal analysis:**

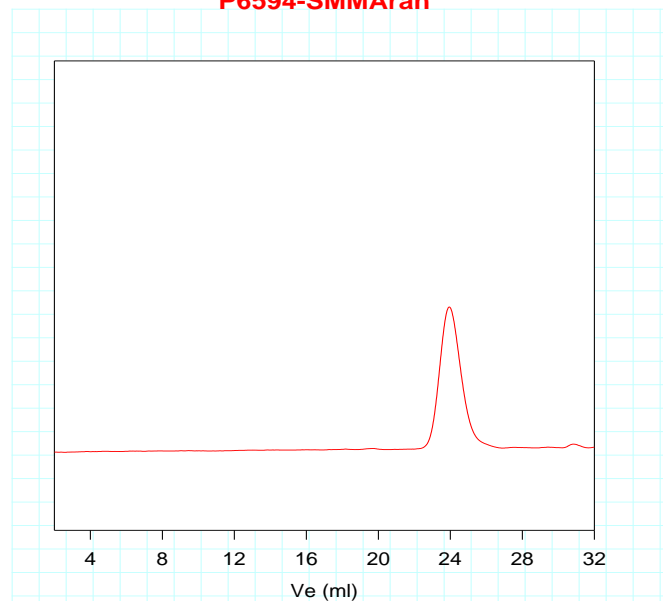
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature ( $T_g$ ).

**Solubility:**

Random Copolymer Poly(styrene-co-methyl methacrylate) is soluble in  $\text{CHCl}_3$ , THF, DMF, toluene and precipitated out from methanol.

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

**P6594-SMMAran**



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

$M_n=24,500$ ,  $M_w=30,300$   $M_w/M_n=1.24$

Polystyrene content: 42 wt% by NMR

**DSC thermogram for the sample:**