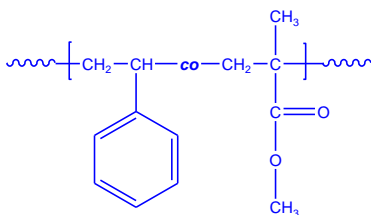


**Sample Name:**

Random Copolymer Poly(styrene-co-methyl methacrylate)

**Sample #:** P6568-SMMAran

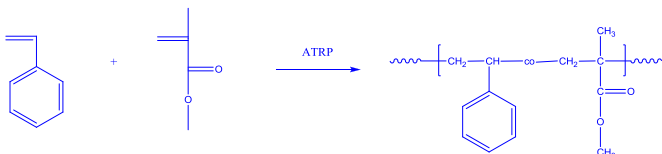
**Structure:****Composition:**

PS (wt%) : 18.2 (17.6 mol%)

Mn x 10 <sup>3</sup> PS-co-PMMA	PDI
64.5	1.85
T <sub>g</sub> for random polymer	110°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:**

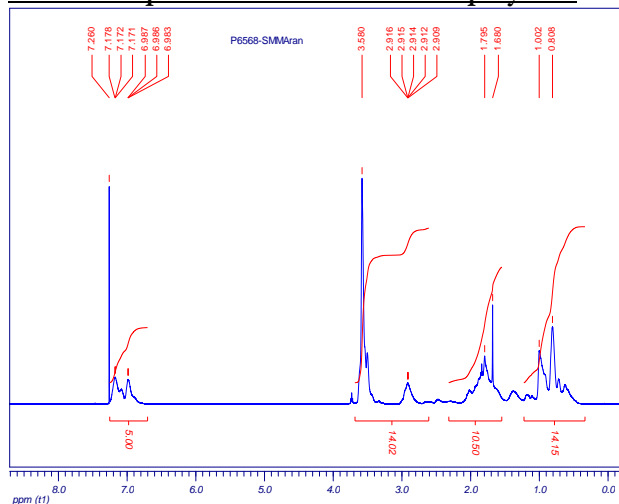
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area the aromatic protons at 6.66-7.05 ppm with the protons of methyl methacrylate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

**Thermal analysis:**

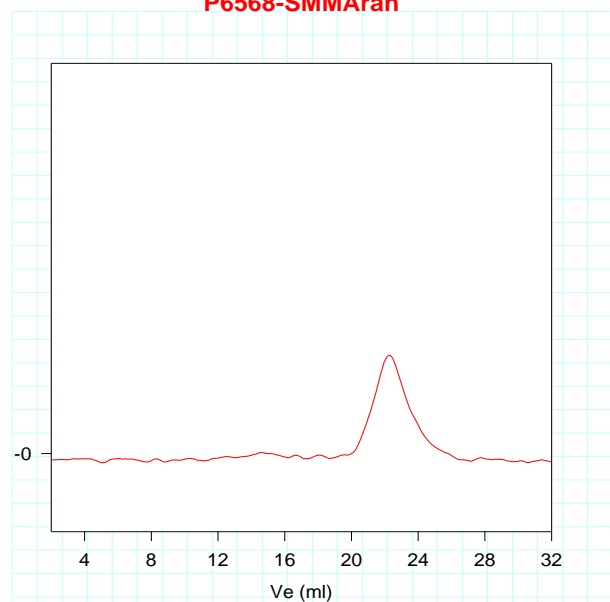
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T<sub>g</sub>).

**Solubility:**

Random Copolymer Poly(styrene-co-methyl methacrylate) is soluble in CHCl<sub>3</sub>, THF, DMF, toluene and precipitated out from methanol.

**<sup>1</sup>H-NMR Spectrum of the random copolymer:****SEC of the random copolymer:**

P6568-SMMAran



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

M<sub>n</sub>=64,500, M<sub>w</sub>=120,000 M<sub>w</sub>/M<sub>n</sub>=1.85  
Polystyrene content: 18.2 wt% by NMR

**DSC thermogram for the sample:**