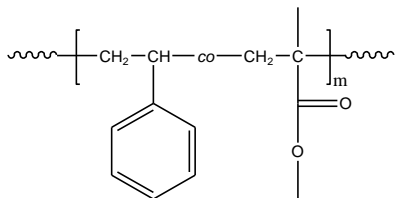


**Sample Name:**

Random Copolymer Poly(styrene-co-methyl methacrylate)

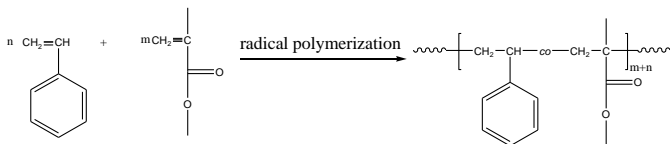
**Sample #: P7040-SMMAran****Structure:****Composition:**

PS (mol%) : 8.00

Mn x 10 <sup>3</sup> PS-co-PMMA	PDI
53.0	2.5
T <sub>g</sub> for random polymer	105°C

**Synthesis Procedure:**

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

**Characterization:**

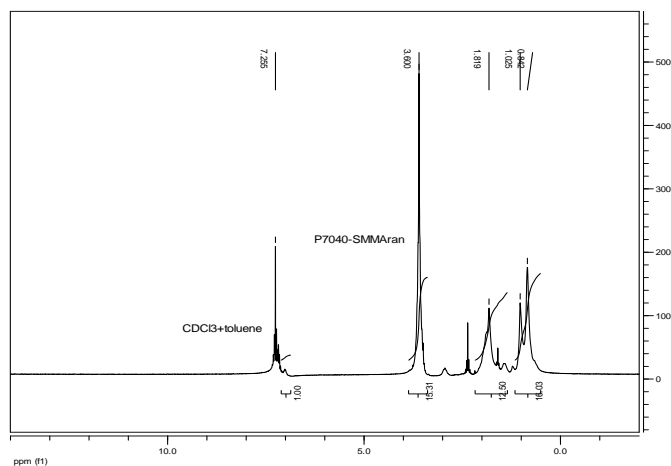
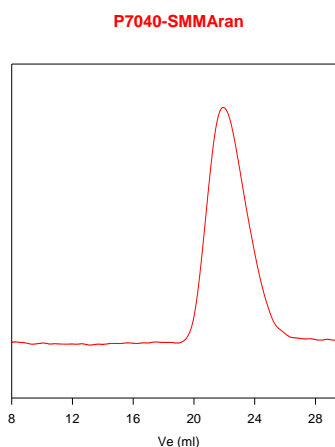
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area the aromatic protons of styrene at about 7.05 ppm with the methyl ester protons of methyl methacrylate at about 3.6 ppm.

**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:**

Size exclusion chromatograph of random copolymer: poly(S-co-MMA):  
M<sub>n</sub>=53000, M<sub>w</sub>=132,300, M<sub>w</sub>/M<sub>n</sub>=2.5  
Polystyrene content: 19.2%mol by NMR

**DSC thermogram for the sample**