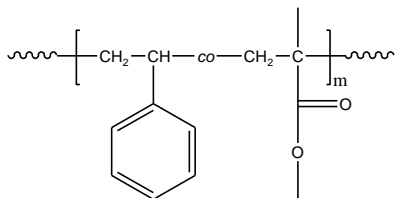


Sample Name:

Random Copolymer Poly(styrene-co-methyl methacrylate)

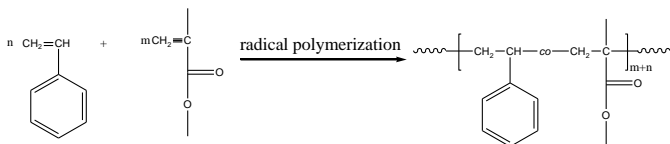
Sample #: P7041-SMMAran**Structure:****Composition:**

PS (mol%) : 10

$M_n \times 10^3$ PS-co-PMMA	PDI
10.6	1.5
T_g for random polymer	97°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:**

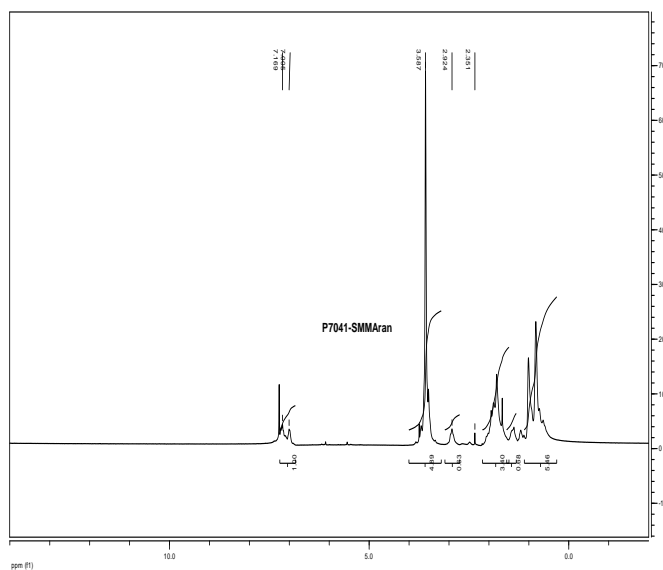
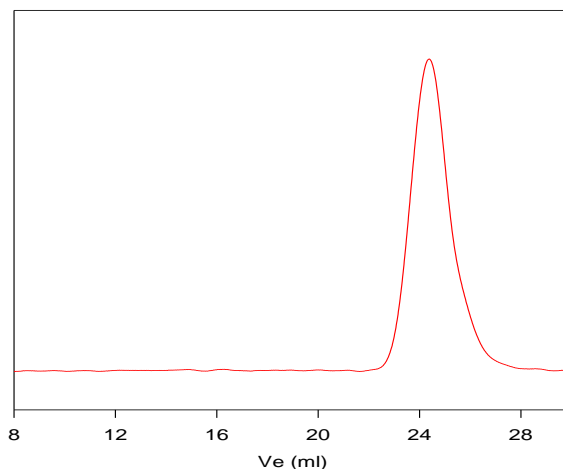
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from $^1\text{H-NMR}$ spectroscopy by comparing the peak area the aromatic protons of styrene at about 7.05 ppm with the methyl ester 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_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:****P7041-SMMAran**

Size exclusion chromatograph of random copolymer: poly(S-co-MMA):
 $M_n=10600$, $M_w=15900$, $M_w/M_n=1.5$
 Polystyrene content: 10%mol by NMR

DSC thermogram for the sample: