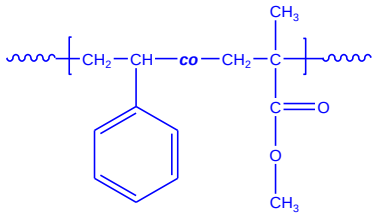
Sample Name:
Random Copolymer Poly(styrene-co-methyl methacrylate)
Sample #: P6595-SMMAran

Structure:

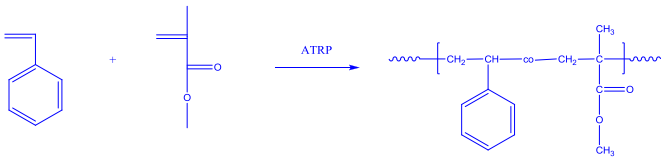


Composition:
PS (wt.%) : 40.0% (39.1mol%)

Mn × 10^3 PS-co-PMMA	PDI
26.0	1.30
T_g for random polymer	102°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:

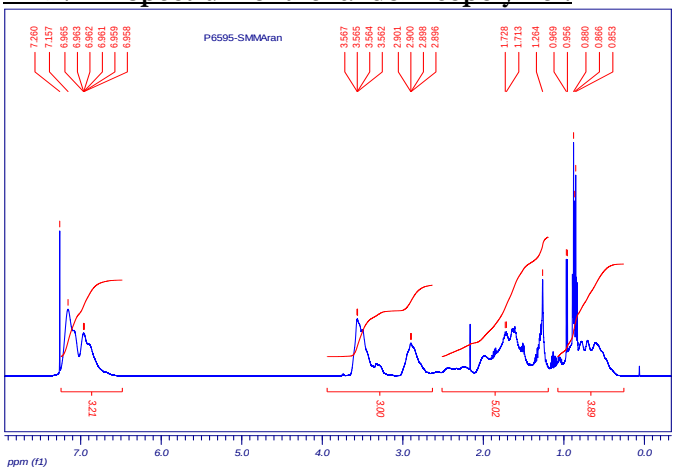


Characterization:
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the aromatic protons from 6.66 to 7.05 ppm with the protons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

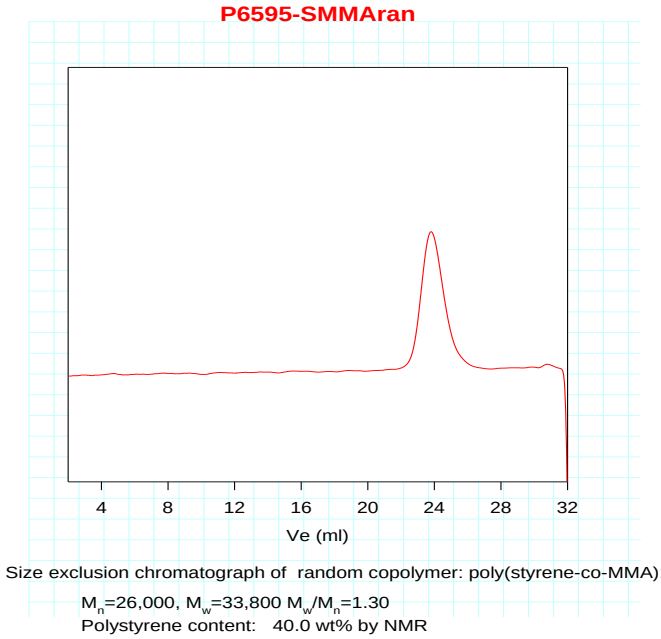
Thermal analysis:
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

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

^{1}H-NMR Spectrum of the random copolymer:



SEC of the random copolymer:



Size exclusion chromatograph of random copolymer: poly(styrene-co-MMA):
M_n=26,000, M_w=33,800 M_w/M_n=1.30
Polystyrene content: 40.0 wt% by NMR

DSC thermogram for the sample: