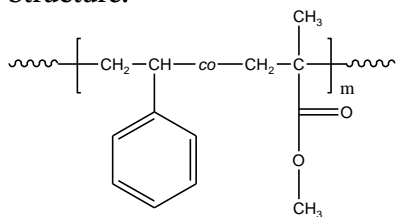


### Sample Name:

Random Copolymer Poly(styrene-co-methyl methacrylate)

Sample #: P9223-SMMArAn

Structure:



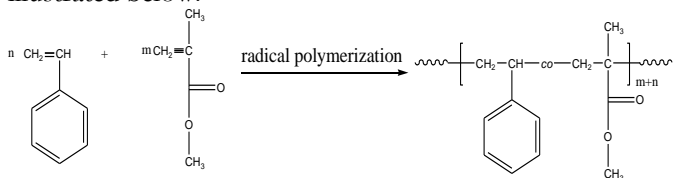
### Composition:

Poly styrene: (mol%) : 46.0

$M_n \times 10^3$ PS-co-PMMA	PDI
5.8	1.26
$T_g$ (°C)	70

### Synthesis Procedure:

Random Copolymer Poly(styrene-co-methyl methacrylate) is prepared by 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 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.

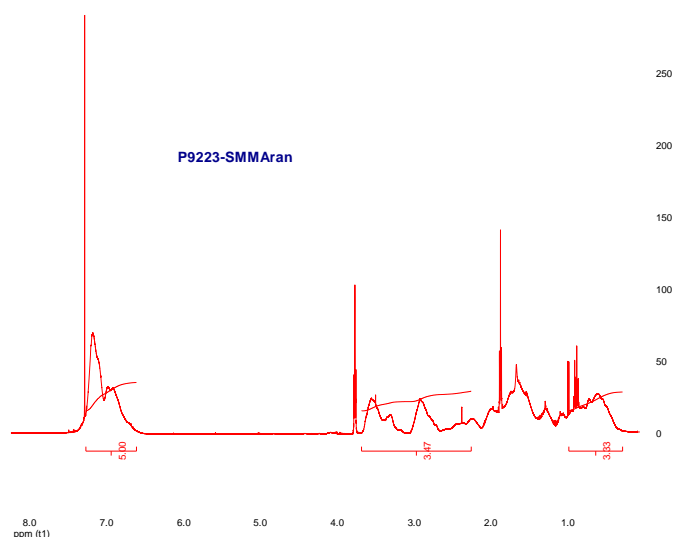
### Thermal analysis:

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 ( $T_g$ ).

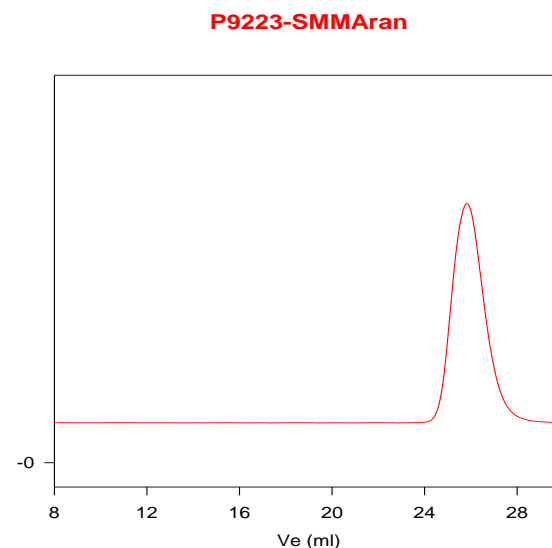
### Solubility:

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:



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

$M_n=5800$ ,  $M_w=7,300$ ,  $M_w/M_n=1.26$

Polystyrene content: 46 mole% by NMR

### DSC thermogram for random polymer:

