Sample Name:
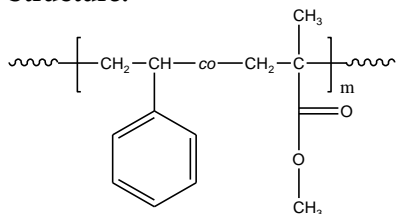**Random Copolymer Poly(styrene-co-methyl methacrylate)**
Sample #: P9226-SMMAran
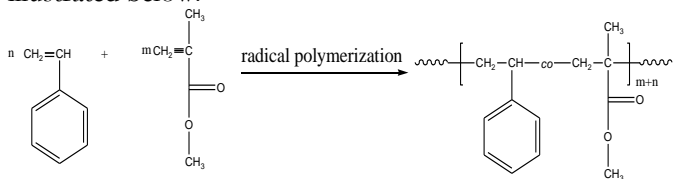**Structure:**

Composition:
Poly styrene: (mol%) : 52.0

Mn × 10³ PS-co-PMMA	PDI
11.5	1.22
T_g (ºC)	85

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 ¹H-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 10ºC/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 CHCl₃, THF, DMF, toluene and precipitated out from methanol.

¹H-NMR Spectrum of the random copolymer:
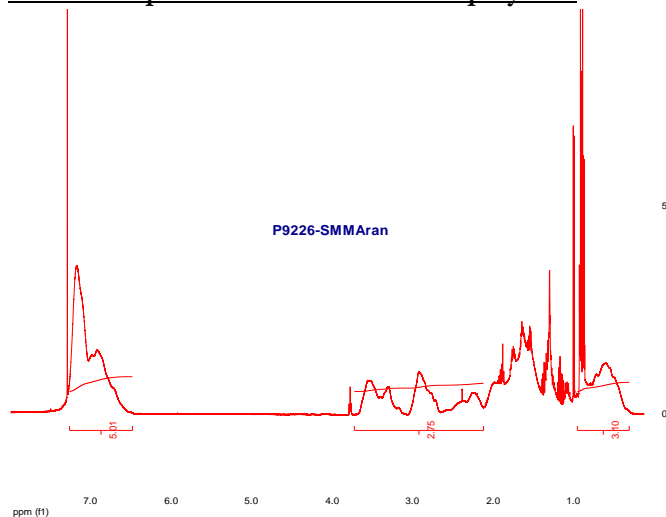
SEC of the random copolymer:

P9226-SMMAran
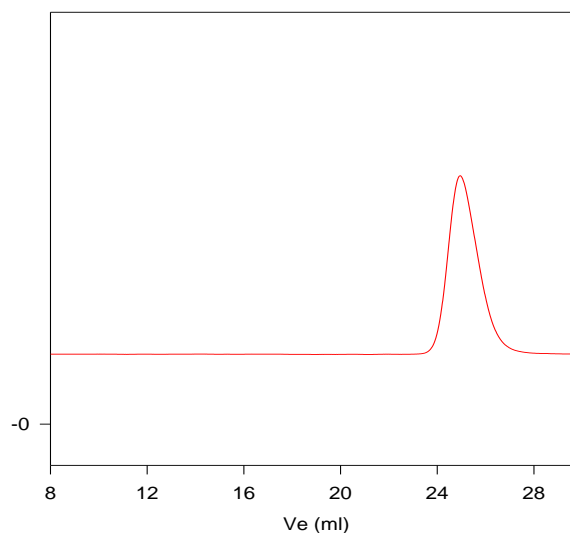
Size exclusion chromatograph of random copolymer: poly(S-co-MMA):
M_n=11,500, M_w=14,000, M_w/M_n=1.22
Polystyrene content: 52 mole% by NMR

DSC thermogram for random polymer: