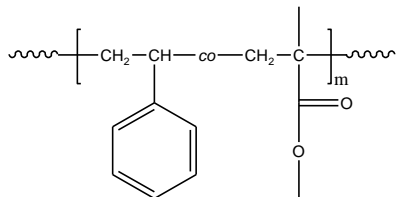Sample Name: **Random Copolymer: Poly(Styrene–co–Methyl Methacrylate)**

Sample #: **P867-SMMAran**

Structure:

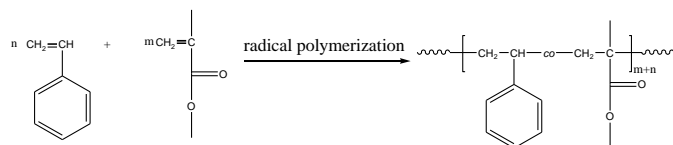
Composition:

Mn x 10^3 PS-co-PMMA	PDI
138	1.64

T_g of the copolymer	117 °C

Synthesis Procedure:
Poly(styrene-co-methyl methacrylate) random copolymer was prepared by radical polymerization of styrene and methyl methacrylate. The scheme of the reaction is presented 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 the aromatic protons of styrene at about 7.05 ppm with the methyl ester protons of methyl methacrylate at about 3.6 ppm.
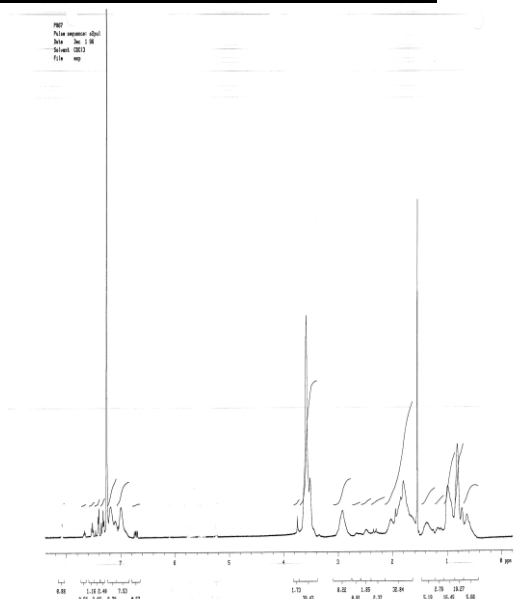
Thermal analysis:
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).
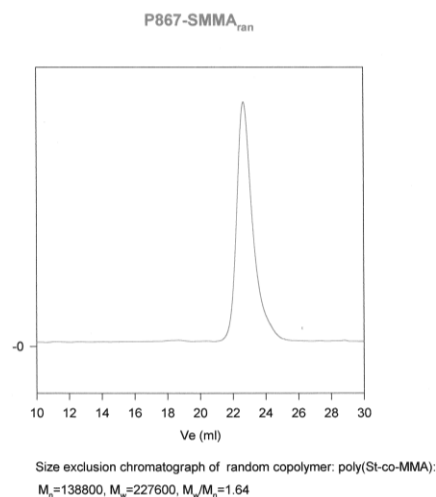
Solubility:
Poly(styrene-co-methyl methacrylate) random copolymer is soluble in CHCl₃, THF, DMF, toluene; and it precipitates from methanol.

^{1}H-NMR spectrum of P867-SMMAran:

SEC elugram of P867-SMMAran:

P867-SMMA$_{ran}$

Size exclusion chromatograph of random copolymer: poly(St-co-MMA): M_n=138800, M_w=227600, M_w/M_n=1.64

DSC thermogram of P867-SMMAran: