<u>Sample Name</u>:
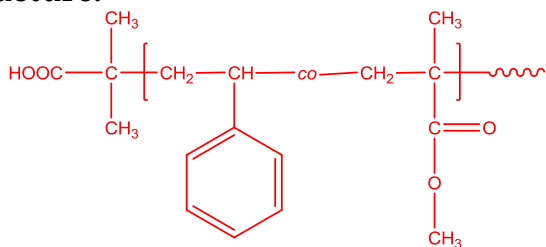
Random Copolymer Poly(styrene-co-methyl methacrylate), Carboxyl Terminated

<u>Sample #</u>: **P6732F2-SMMAranCOOH**
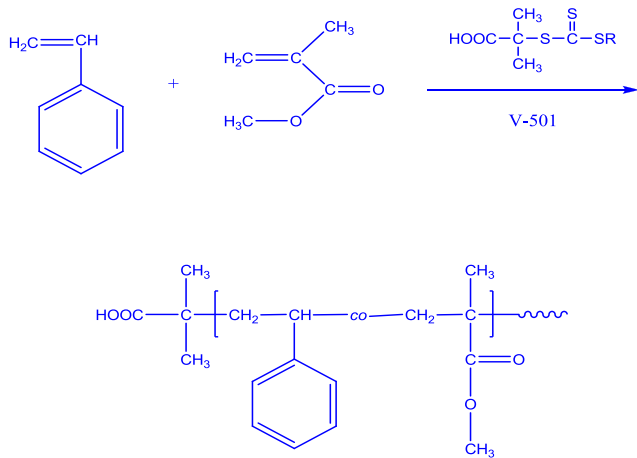
Structure:

Composition:

Mn × 10³ (Styrene content mol%)	Mw/Mn (PDI)
3.6 (58 %)	1.50
T_g (°C)	72

Synthesis Procedure:

Carboxyl terminated poly(styrene-co-methyl methacrylate) is prepared by RAFT polymerization at 65°C. The reaction scheme is shown below:

Characterization:

An aliquot of the copolymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The instrument was calibrated by Polystyrene standards. The chemical composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the phenyl protons at 6.8-7.4 ppm with the peak area of methyl methacrylate at 2.6-3.6 ppm.
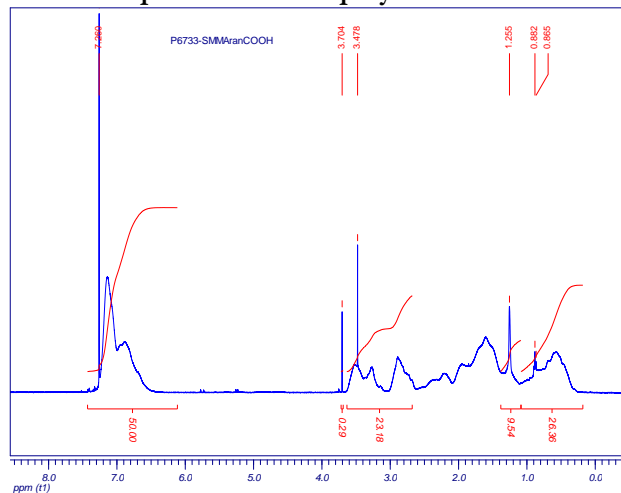
Thermal analysis:

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).
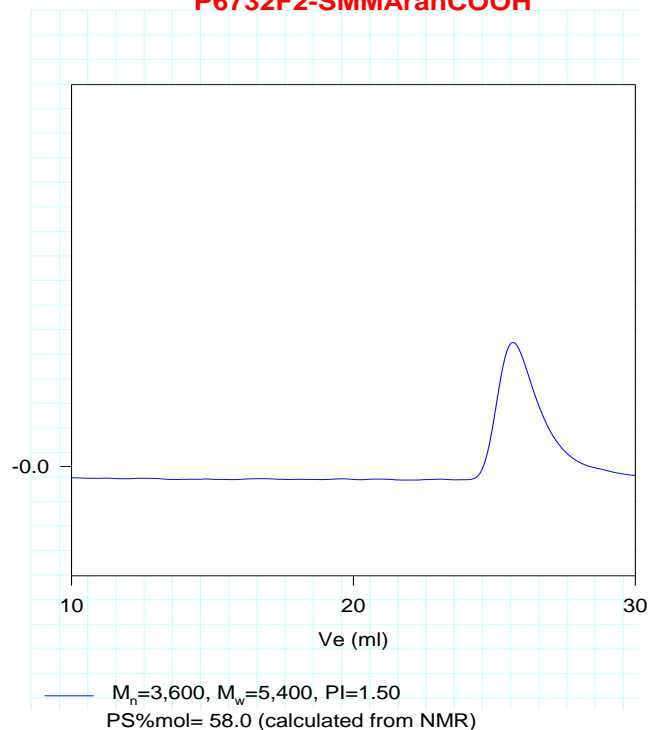
Solubility:

Poly(styrene-co-methyl methacrylate) is soluble in THF, DMF, Toluene and chloroform. Precipitate from methanol and Hexanes.

¹H NMR spectrum for the polymer:

SEC profile of the random copolymer

P6732F2-SMMAranCOOH

M_n=3,600, M_w=5,400, PI=1.50
PS%mol= 58.0 (calculated from NMR)

DSC thermogram for the random polymer: