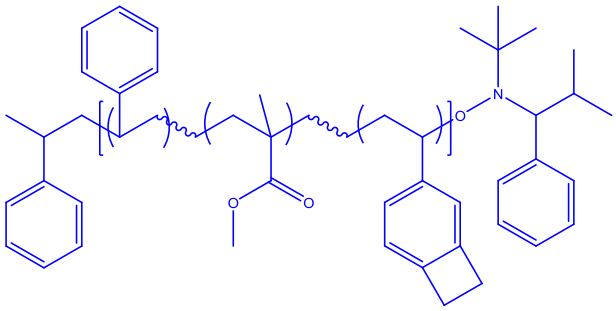
Sample Name:

Random Copolymer Poly(styrene-co-methyl methacrylate-co-vinyl benzocyclobutene)

Sample #: **P6588-SMMAranVB**

Structure:



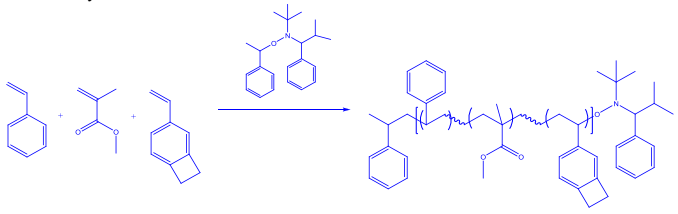
Composition:

PS (mol%) : 56%; MMA: 42%; VB: 2%

Mn x 10^3 S-co-MMA-co-VB	PDI
45.0	1.25
T_g for the random copolymer	90°C

Synthesis Procedure:

Random Copolymer is prepared by nitroxide-mediated radical polymerization of styrene, vinyl benzocyclobutene and MMA.



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 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.

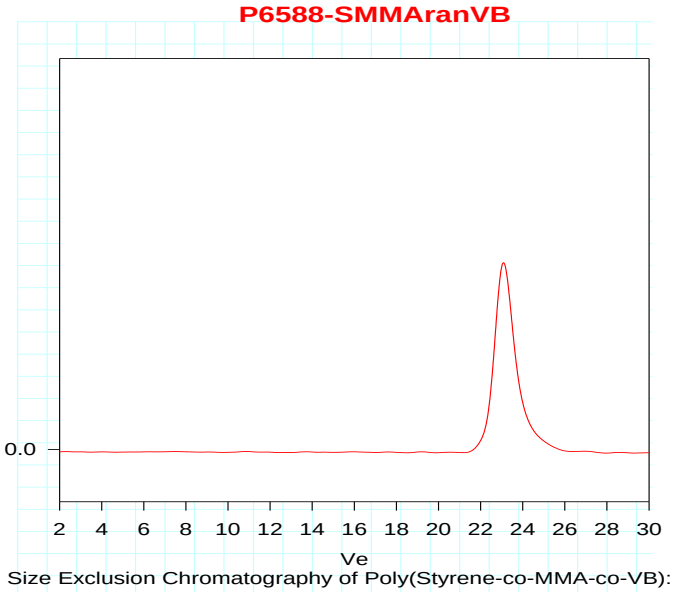
Thermal analysis:

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). During thermal scan a peak was observed at 230°C which corresponds to cross-linking of the polymer. In addition, heat treated polymer was not dissolved in $CHCl_3$.

Solubility:

Random Copolymer Poly(styrene-co-MMA-co-VB) is soluble in $CHCl_3$, THF, DMF, toluene and precipitated out from methanol.

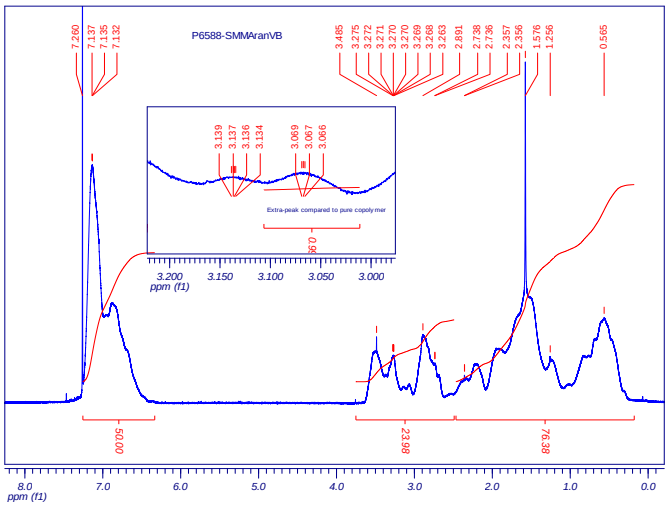
SEC of the random copolymer:



Size Exclusion Chromatography of Poly(Styrene-co-MMA-co-VB):

M_n= 45,000, M_w= 56,300, M_w/M_n =1.25

Proton NMR of copolymer:



DSC thermogram for the sample: