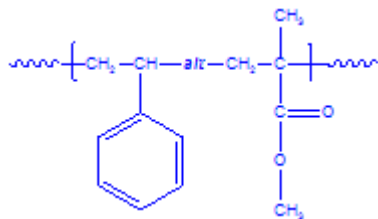## Sample Name:

Alternating Copolymer Poly(styrene-alt- methyl methacrylate)

Sample #: P392-SMMAalt

Structure:

Composition:

Mn x 10^3 PS-alt-PMMA	PDI
46.2	2.28
T_g for alternating polymer	99°C

Synthesis Procedure:

Poly(styrene-alt- methyl methacrylate) is prepared by free radical polymerization in toluene with BPO as an initiator in the presence of ethyl aluminum sesquichloride.
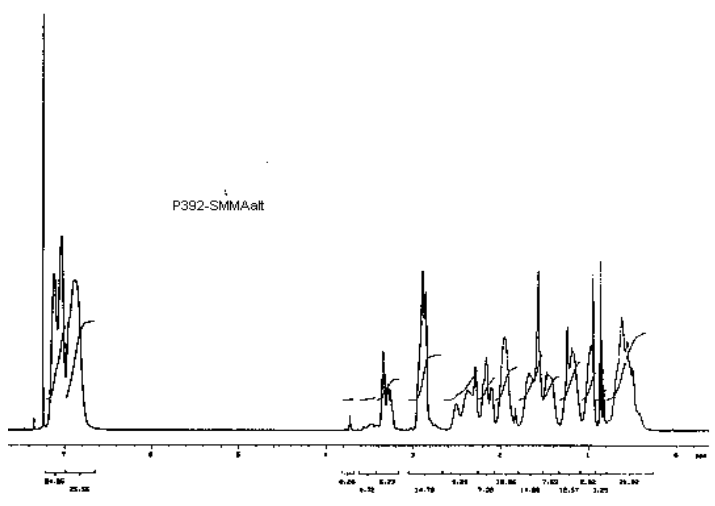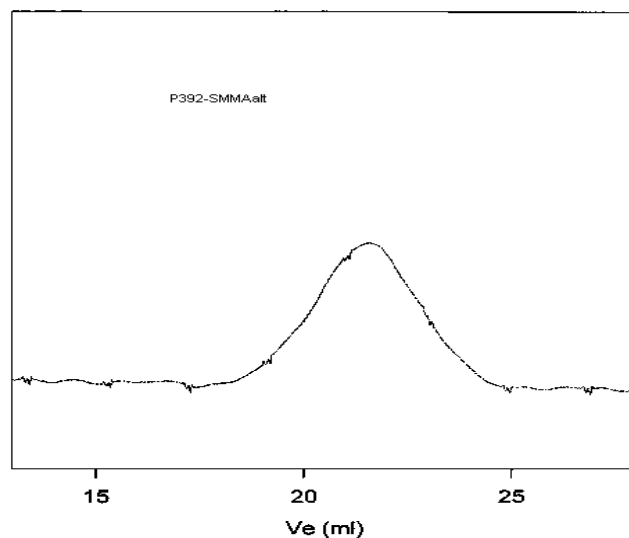
Characterization:

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 peak area of methyl methacrylate at 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:

Random copolymer Poly(styrene-alt- methyl methacrylate) is soluble in CHCl$_3$, THF, DMF, toluene and precipitated out from methanol.

^{H}NMR spectrum of the random polymer

P392-SMMAalt

SEC for the polymer

P392-SMMAalt

Size exclusion chromatography of altenating copolymer Polystyrene-alt-Poly(methyl methacrylate):

M_w=96100, M_n=46200, M_z=222100, PI=2.08

DSC thermogram for the sample

96.77°C
99.39°C(T)
102.25°C

Exo Up   Universal V4.2E TA Instruments