Sample Name: **Poly(α-methyl styrene)**

Sample #: P9086-MeS

## Structure:

$$CH_3$$

$$\sim\sim\sim\left[CH_2-C\right]_n\sim\sim\sim$$

(phenyl ring)
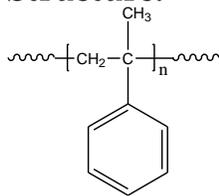
Composition:

Mn x 10^3	PDI
350.0	1.05
T_g (°C)	153

Synthesis Procedure:

Poly(α -methyl styrene) is synthesized by living anionic polymerization of α -methyl styrene and the reaction scheme is shown below.

$$CH_3$$
$$H_2C=C$$
(phenyl ring)
n

→ Anionic Polymerization, THF / -78°C →

$$CH_3$$
$$\sim\sim\sim\left[CH_2-C\right]_n\sim\sim\sim$$
(phenyl ring)
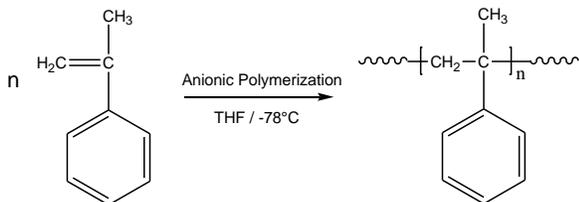
Characterization:

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

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(α-methyl styrene) is soluble in DMF, THF, toluene and CHCl₃. It precipitates from methanol, ethanol, water and hexanes.

SEC of Homopolymer:

P9086-αMeS

Viscotek Triple Detector
Concentration (RI)
Viscosity
Light Scattering
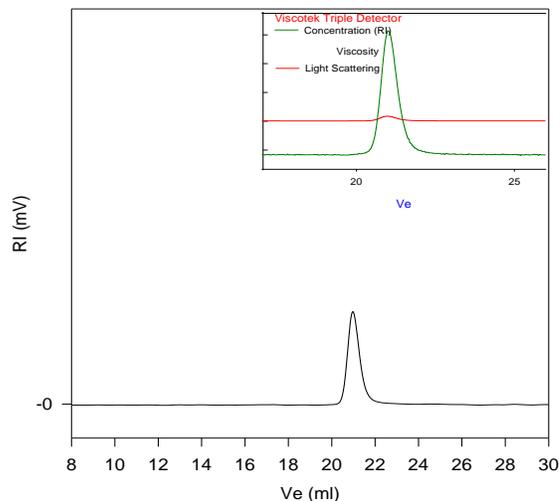
Size Exclusion Chromatography of polymer;

——— M_n = 350,000, M_w =367,000, M_w/M_n = 1.05
In box Light Scattering data from Triple detectors:
dn/dc in THF 0.185ml/g Solution Viscosity in THF at 35 oC: 1.096dl/g
Radius of Gyration: 24.35nm

DSC thermogram for the polymer:

146.34°C

153.43°C(T)

160.46°C

Exo Up

Universal V4.2E TA Instruments