<u>Sample Name</u>: **Polystyrene**

<u>Sample #</u>: **P8075-S**

Structure:

$$\sim\!\!\sim\!\!\left[CH_2-CH\right]_n\!\!\sim\!\!\sim$$
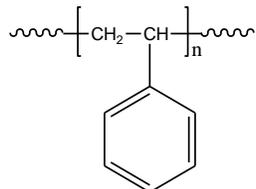
Composition:

Mn x 10^3	PDI
28.0	1.2

Synthesis Procedure:

Polystyrene is obtained by living anionic polymerization of styrene as illustrated below:

$$H_2C{=\!\!=}CH \xrightarrow[\text{THF at -78}^o\text{C}]{\text{Appropriate initiator}} \sim\!\!\sim\!\!\left[CH_2-CH\right]_n\!\!\sim\!\!\sim$$
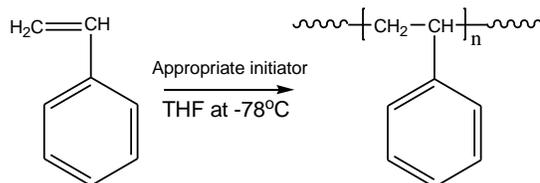
Characterization:

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:

Thermal analysis of the sample was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10oC/min.The inflection glass transition temperature (Tg) has been considered.

Solubility:

Polystyrene is soluble in DMF, THF, toluene and $CHCl_3$. It precipitates from methanol, ethanol, water and hexanes.

SEC of Homopolymer:

P8075-S
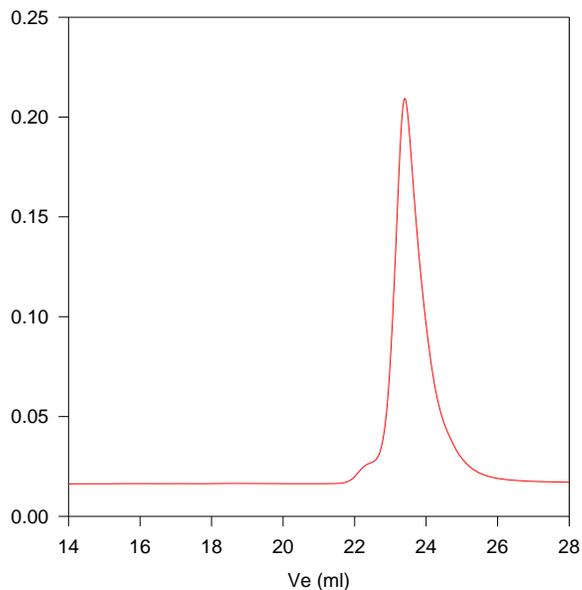
Size exclusion chromatograph for polystyrene
M_n=28000, M_w=33500, PI=1.2

Solution Viscosity in THF at 35 ^{o}C: 0.28dl/gRadius of Gyration: 6.78 nm

These values were obtained from the Viscotek triple detectors

T_g of polystyrene as function of molecular weight