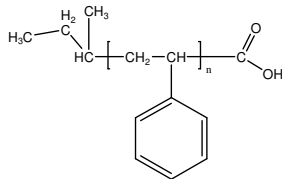


Sample Name:

Mono carboxy Terminated Polystyrene

Sample #: **P18735-SCOOH**

Structure:



Composition:

| | |
|-------------------|------|
| $M_n \times 10^3$ | PDI |
| 2.8 | 1.06 |
| Functionality % | 99 |

Synthesis Procedure:

Carboxy Terminated Poly(styrene) was prepared by anionic living polymerization of styrene in THF followed by termination with dried CO_2 .

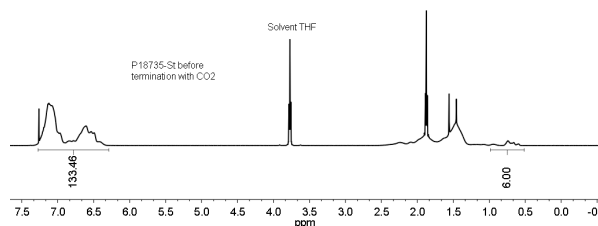
Characterization:

The molecular weight and polydispersity index of this polymer were determined before addition of the CO_2H function, by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. Polymer functionality was determined by titration with NaOH using phenolphthalein as the indicator.

Solubility:

Polymer is soluble in toluene, THF, CHCl_3 and can be precipitated in water and cold methanol.

^1H NMR:



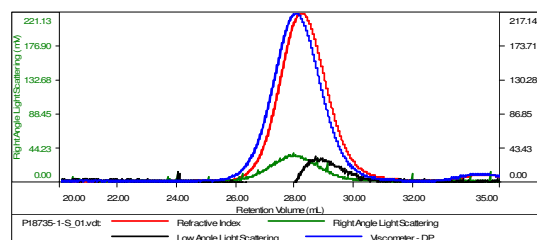
Comparison of T_g between polystyrene and carboxy terminated polystyrene

The glass transition temperature (T_g) between polystyrene (PS) and carboxy terminated polystyrene (PSCOOH) both having M_n of 2000 are compared at heating rate of $10^\circ\text{C}/\text{min}$. It has been found that the T_g of PSCOOH was 15°C higher (79°C) than the corresponding PS (64°C). Thermograms for both samples are shown below:

SEC of Sample:

Sample ID: P18735-1-S

| | |
|-----------------------|----------------------------|
| Concentration (mg/mL) | 33.1433 |
| Sample drydc (mL/g) | 0.1850 |
| Method File | PS80K-June10-2014-0000.vcm |
| Column Set | 3x PL 1113-6300 |
| Solvent | THF |



| Sample | M_n | M_w | M_p | M_w/M_n | IV |
|-------------------|-------|-------|-------|-----------|--------|
| P18735-1-S_01.vdt | 2,823 | 2,964 | 2,924 | 1.050 | 0.0541 |

