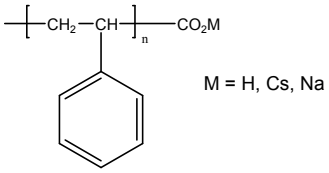
Sample Name:
Carboxy Terminated Polystyren

Sample #: P19413- SCOOH

Structure:

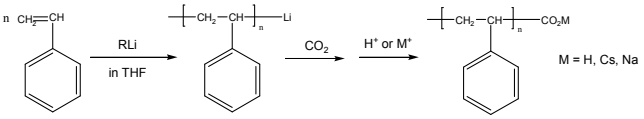


Composition:

Mn x 10^3	PDI	Functionality %
524.0	1. 23	>95
T_g (°C)	106	

Synthesis Procedure:

Carboxy Terminated Poly(4-t-butyl styrene) was prepared by anionic living polymerization of tert.butyl styrene in THF followed by termination with dried CO_2. The scheme of the reaction is illustrated below::



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 solution using phenolphthalein as the indicator.

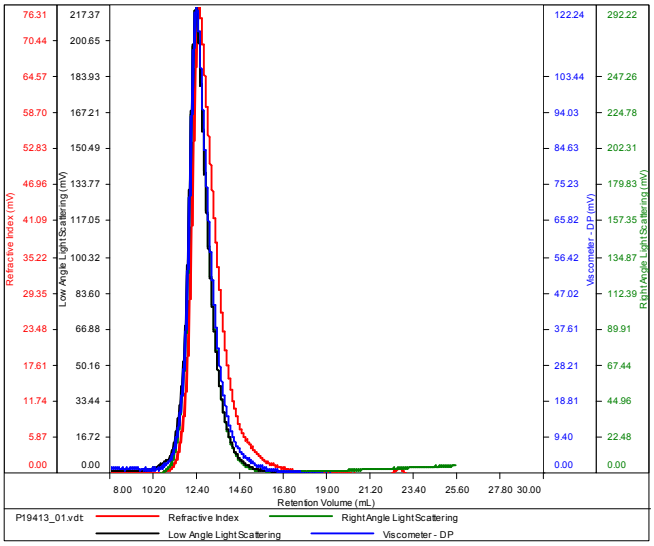
Thermal analysis:
Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10°C/min.The inflection glass transition temperature (T_g) has been considered.

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

SEC of Sample:

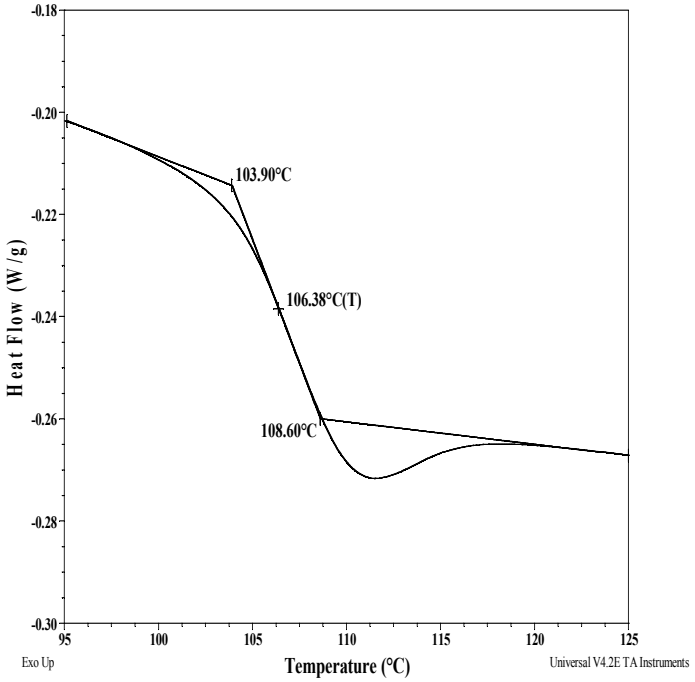
SAMPLE ID: P19413-SCOOH

Conc (mg/mL)	1.9170
dn/dc (mL/g)	0.1650
Method	ps80k-July242015-0000.vcm
Solvent	DMF w 0.03M LiBr
Column	PSS



Sample	Mn	Mw	Mp	Mw/Mn	IV
P19413_01.vdt	524,444	645,585	734,652	1.231	0.8976

DSC thermogram for the sample:



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°C/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: