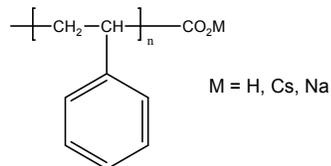


**Sample Name:**  
Carboxy Terminated Polystyrene

**Sample #: P2827- SCOOH**

**Structure:**

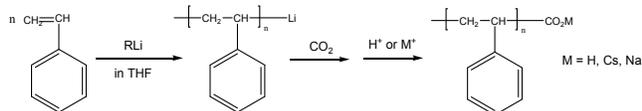


**Composition:**

Mn x 10 <sup>3</sup>	PDI	Functionality %
0.9 Dp: 9	1.5	99
T <sub>g</sub> (°C)	60	

**Synthesis Procedure:**

Carboxy Terminated Poly(styrene) was prepared by anionic living polymerization of styrene in THF followed by termination with dried CO<sub>2</sub>. 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<sub>2</sub>H 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.

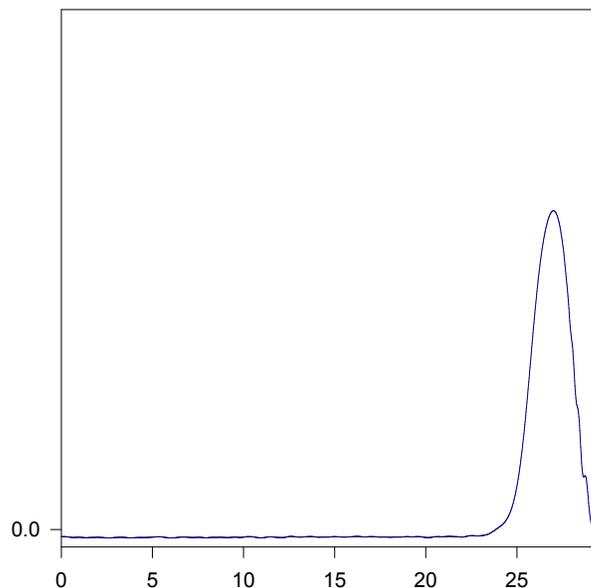
**Thermal analysis:**

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<sub>g</sub>) has been considered.

**Solubility:** Polymer is soluble in toluene, THF, CHCl<sub>3</sub> and can be precipitated in water, cold methanol.

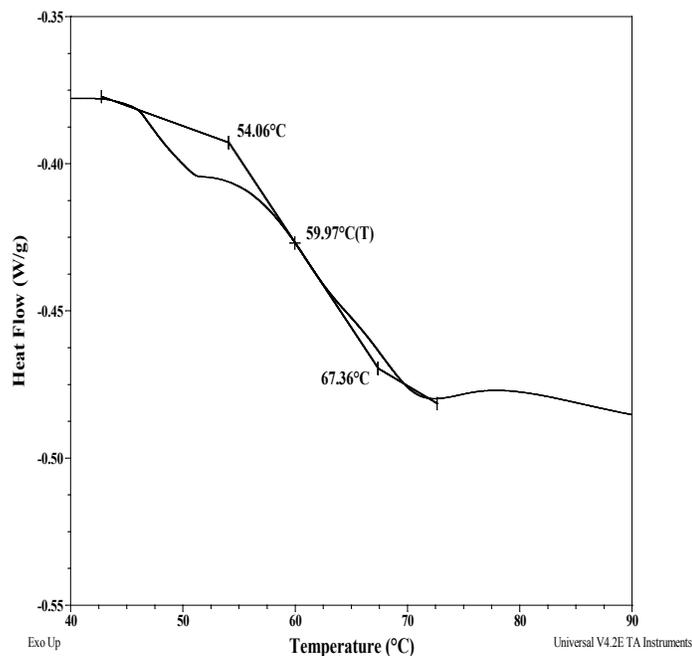
**SEC of Sample:**

**P2827-SCOOH**



Size exclusion chromatography of polystyrene (before termination with carbondioxide):  
Mn: 950 Mw:1420 Mw/Mn:1.5 'f': 99%

**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  $10^\circ\text{C}/\text{min}$ . It has been found that the  $T_g$  of PSCOOH was  $15^\circ\text{C}$  higher ( $79^\circ\text{C}$ ) than the corresponding PS ( $64^\circ\text{C}$ ). Thermograms for both samples are shown below:

