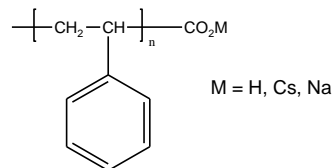


Sample Name:
Carboxy Terminated Polystyrene

Sample #: P3949-SCOOH

Structure:

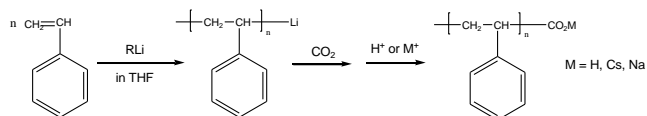


Composition:

$M_n \times 10^3$	PDI	Functionality %
16.5	1.06	>99
T_g (°C)	99	

Synthesis Procedure:

Carboxy Terminated Poly(styrene) was prepared by anionic living polymerization of 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.

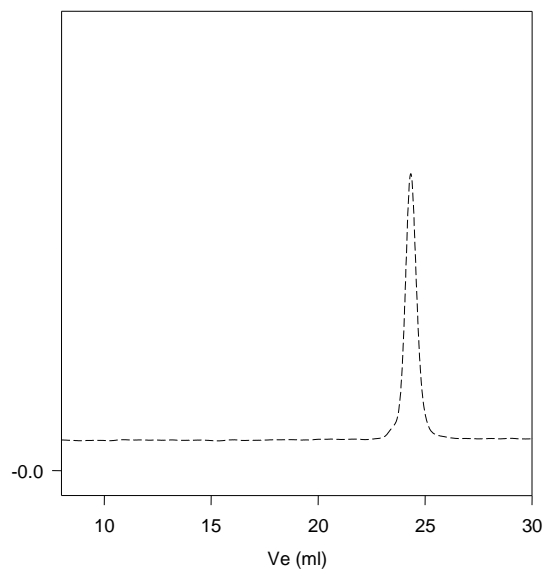
Thermal analysis:

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of $10^\circ\text{C}/\text{min}$. 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.

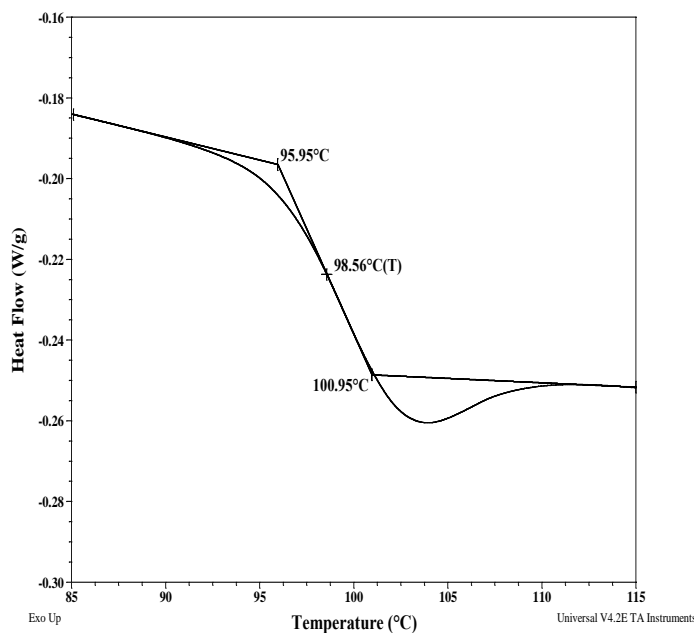
SEC of Sample:



Size exclusion chromatography of monocarboxy terminated polystyrene (before adding CO_2).

$M_n=16500$, $M_w=17500$ PI=1.06 functionality>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°C higher (79°C) than the corresponding PS (64°C). Thermograms for both samples are shown below:

