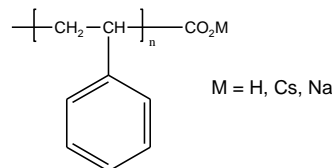


Sample Name:

Mono carboxy Terminated Polystyrene

Sample #: **P10550-SCOOH**

Structure:

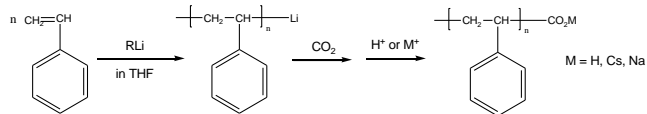


Composition:

$\text{M}_n \times 10^3$	PDI
9.7	1.08
T_g ($^{\circ}\text{C}$)	105
Functionality %	98

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 using phenolphthalein as the indicator.

Thermal analysis:

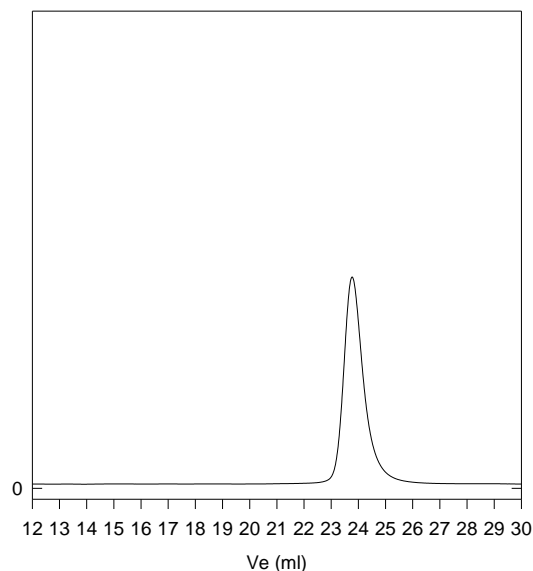
Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of $10^{\circ}\text{C}/\text{min}$. The inflection glass transition temperature (T_g) has been considered.

Solubility:

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

SEC of Sample:

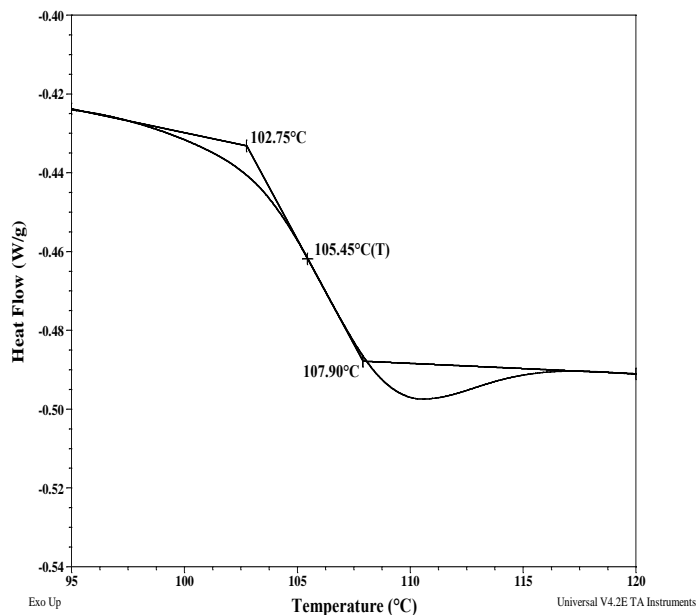
P10550-SCOOH



Size exclusion chromatography of monocarboxy terminated polystyrene (before adding Co_2).

$\text{M}_n=9,700$, $\text{M}_w=10,500$ $\text{PI}=1.08$ functionality >98%

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:

