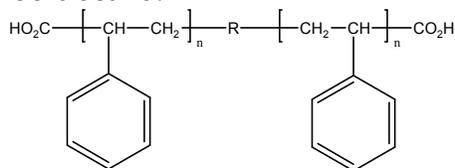


Sample Name:

α,ω -Carboxy Terminated Polystyrene

Sample #: **P4308-S2COOH**

Structure:

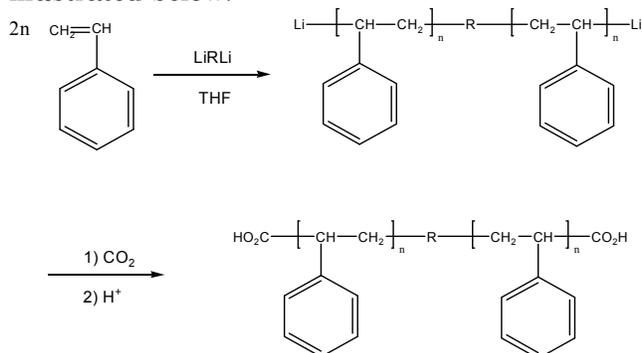


Composition:

$M_n \times 10^3$	PDI
55.0	1.10
Functionality	>1.90
T_g ($^\circ\text{C}$)	106

Synthesis Procedure:

The functionalized polymer was prepared by anionic living polymerization of styrene using bifunctional as initiator in THF followed by terminating the polymerization reaction 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 the addition of the carboxy function by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. In columns, after termination of CO_2 with the polymer the elution is retarded due to strong interaction with the column packing material. In addition it leads to broaden the M_w/M_n . Polymer functionality was determined by the titration with NaOH using phenolphthalein as indicator.

Thermal analysis:

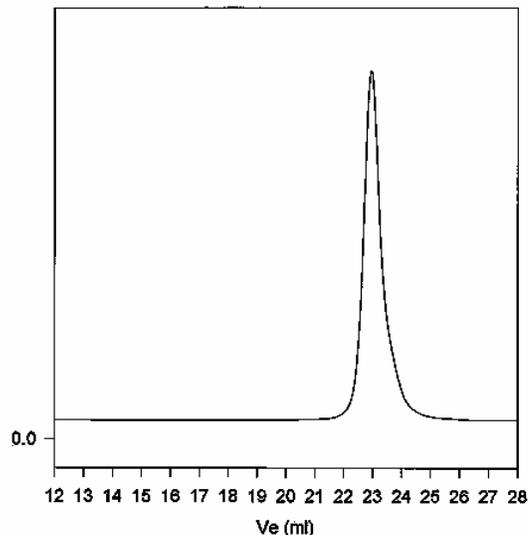
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^\circ\text{C}/\text{min}$. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Polymer is soluble in THF, Dioxane, CHCl_3 and precipitated out from methanol/water, and in cold hexane.

SEC of Sample:

P4308-S2COOH



Size exclusion chromatography of α,ω -dicarboxy terminated polystyrene before termination with CO_2 :

$M_n=55000$, $M_w=61000$, $PI=1.10$,

functionality=1.95 by titration: Solution viscosity in THf at 30°C : 0.356dl/g
Radius of Gyration: 9.12nm

DSC thermogram for the polymer:

