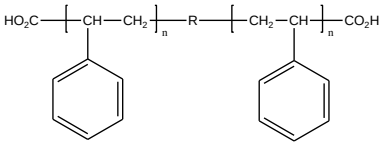
Sample Name:
**Poly(styrene), α,ω-bis(carboxy)-terminated**

Sample #: **P422-S2COOH**

**Structure:**

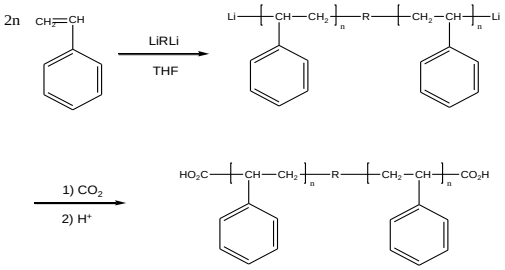


**Composition:**

| Mn × $10^3$ | PDI |
|---|---|
| 51.7 | 1.08 |

| Functionality>1.95 |
|---|
| $T_g$ (°C)107 |

**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:

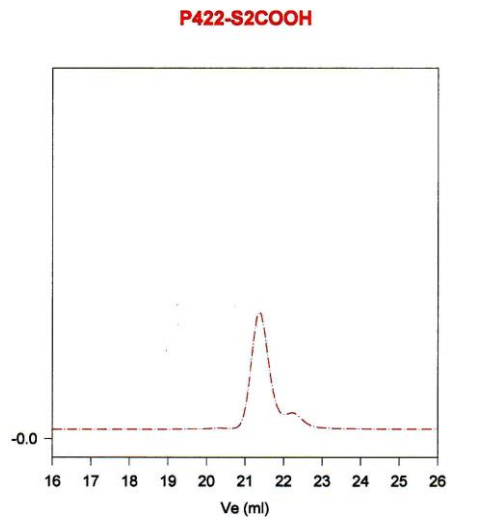



**Characterization:**
The molecular weight and polydispersity index of this polymer were determined before the addition of the carboxy function by size exclusion chromatography (SEC) using a Varian liquid chromatograph equipped with a UV and refractive index detector. In our columns the polymer after termination with C02 the elution is retarded. This is because of the strong interaction with the column packing material. Furthermore, the Mw/Mn broadens because of that reason.
Polymer functionality was determined by the titration with NaOH using phenolphthalein as the indicator.

**Thermal analysis:**
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/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 profile of the Sample:**




Size exclusion chromatography of α,ω-dicarboxy terminated polystyrene.

$M_n$=51700, $M_w$=55600, $M_z$=58600, PI=1.08, functionality=1.95.

**DSC thermogram for the polymer:**