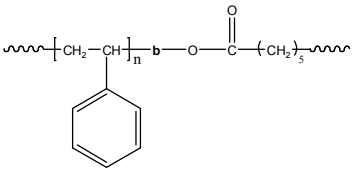
**Sample Name: Poly(styrene-b-ε-caprolactone)**

**Sample #: P2043-SCL**

**Structure:**



**Composition:**

| Mn × $10^3$ S-b-CL | Mw/Mn (PDI) |
|---|---|
| 9.50-21.4 | 1.12 |

**Synthesis Procedure:**

Poly(styrene-b-ε-caprolactone) is prepared by anionic polymerization with sequence addition of styrene followed by n-butyl methacrylate.

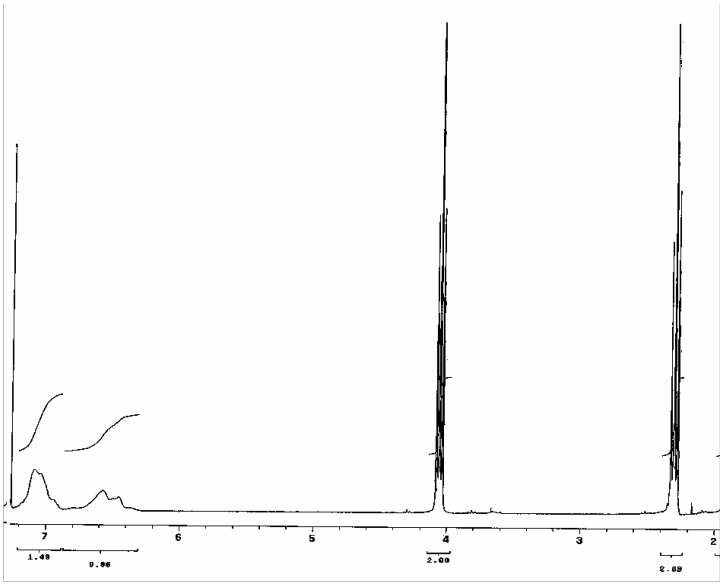
**Characterization:**

An aliquot of the polystyrene block was terminated before addition of -ε-caprolactone and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from $^1$H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of -ε-caprolactone protons at 4.1 ppm. Block copolymer PDI is determined by SEC.

**Solubility:**

Poly(styrene-b-ε-caprolactone) is soluble in THF, Chloroform, DMF, and precipitated in methanol and hexanes.

**NMR of the block polymer:**

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## Thermal analysis of the sample# P2043-SCL

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10$^{o}$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 ($T_g$).

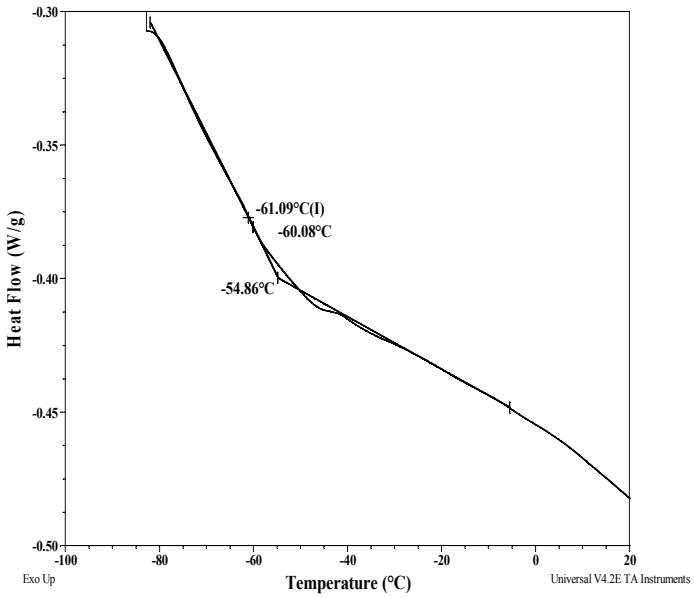
### Melting and crystallization curve for the sample

The melting temperature ($T_m$) was taken as the maximum of the endothermic peak where as the crystallization temperature ($T_c$) was considered as the minimum of the exothermic peak.

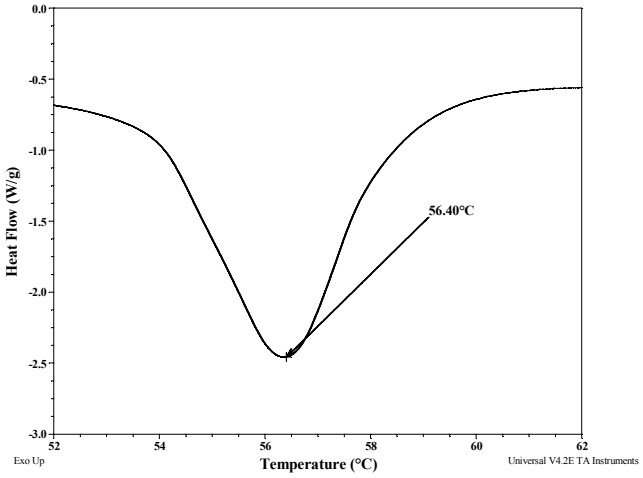
### Thermal analysis results at a glance

| Sample | $T_m$ ($^{o}$C) | $T_c$ ($^{o}$C) | $T_g$ ($^{o}$C) |
|---|---|---|---|
| ε-CL | 56 | 22 & 33 | -61 |
| PS | - | - | Not distinct |

### Thermogram for ε-caprolactone block:




### Melting curve for ε-caprolactone block:




### Crystallization curve for CL block: