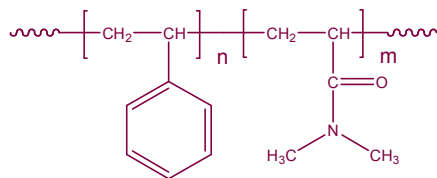


**Sample Name:** Poly(styrene-*b*-N,N-dimethyl acrylamide)

**Sample #:** P4809F1-SDMA

**Structure:**

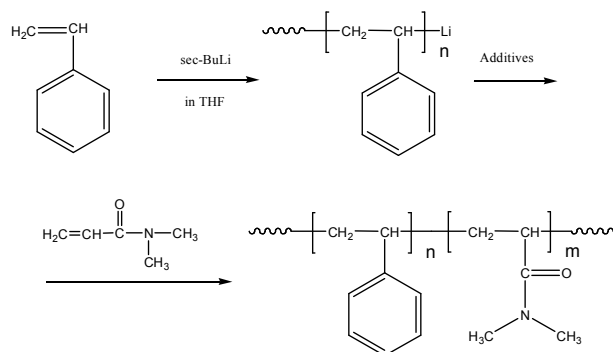


**Composition:**

| Mn × 10 <sup>3</sup><br>S-b-DMA | Mw/Mn (PDI) |
|---------------------------------|-------------|
| 36.0-b-75.5                     | 1.3         |

**Synthesis Procedure:**

Poly(styrene-*b*-N,N-dimethyl acrylamide) is prepared by living anionic polymerization in THF at -78 °C in the presence of LiCl as an additive. Polystyrene macroanions were end capped <sup>1</sup> before adding N,N-dimethyl acrylamide (DMA) monomer. For further details please see our published article. The scheme of the reaction is illustrated below:



**Characterization:**

An aliquot of the polystyrene block was terminated before addition of N,N-dimethyl acrylamide and analyzed by size exclusion chromatography (SEC) in THF to obtain the molecular weight (by light scattering detector) and polydispersity index (PDI). The final block copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of N,N-dimethyl acrylamide (N(CH<sub>3</sub>)<sub>2</sub> 2.8-3.2 ppm. Block copolymer PDI is determined by SEC in pure DMF.

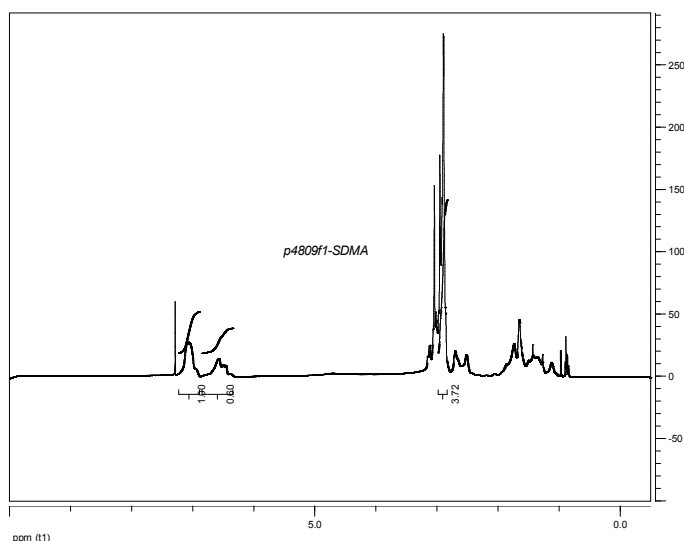
**Purification of the Polymer:**

The obtained polymer was precipitated in cold methanol or in Hexane/Ethanol cold depending on the compositions. The polymer was re-dissolved in CHCl<sub>3</sub> and wash with water. The polymer was dried in toluene/THF using rota-evaporator. The polymer was precipitated in hexane and dried at 40 °C under vacuum.

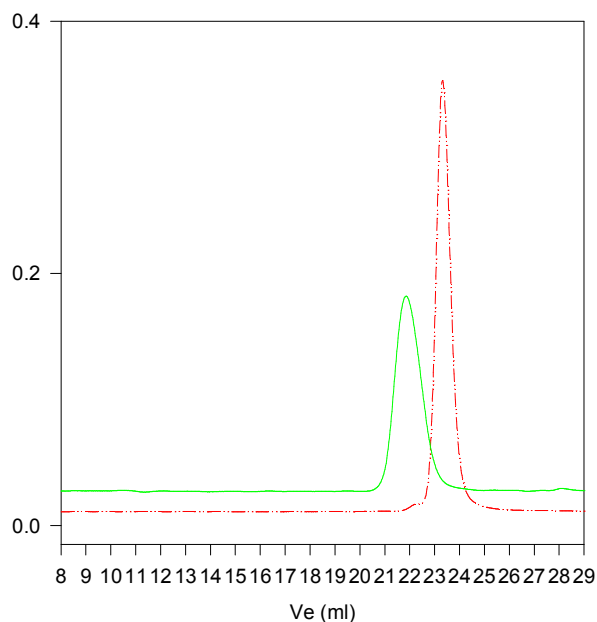
**Solubility:**

Poly(styrene-*b*-N,N-dimethyl acrylamide) is soluble in Chloroform, DMF, and precipitated in hexanes. Micellization or partially micellization will be found in THF or DMF especially in presence of the salts, such as LiCl, LiBr and NaCl.

**<sup>1</sup>H NMR spectrum of the sample**



**SEC profile of the block copolymer  
P4809f1-SDMA**



--- Polystyrene, M<sub>n</sub>=36000, M<sub>w</sub>=37800, PI=1.05  
— Block Copolymer PS(36000)-b-PDMA(14500), PI=1.25  
SEC carried out in DMF at 40 °C Compositions from H NMR

*Contd. in the next page*

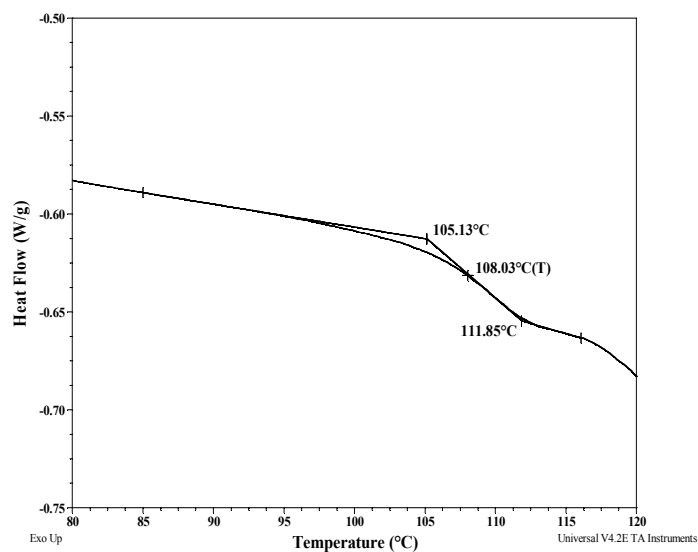
## Thermal analysis for sample#4809F1-SDMA

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 ( $T_g$ ).

## Thermal analysis results at a glance

| Block | $T_g$ (°C) |
|-------|------------|
| PS    | 108        |
| PDMA  | 123        |

### DSC thermogram for PS block:



### DSC thermogram for DMA block:

