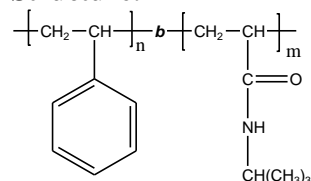


Sample Name: Poly(styrene-b-N-isopropyl acrylamide)

Sample #: P14131B-SNIPAM

Structure:

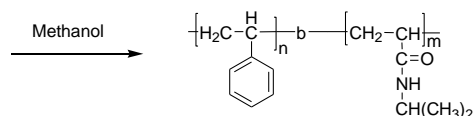
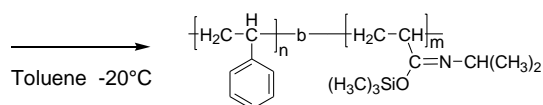
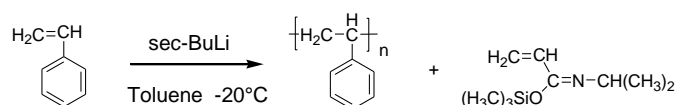


Composition:

Mn x 10 ³ S-b-NIPAM	Mw/Mn (PDI)
13-b-6.0	1.2

Synthesis Procedure:

Poly(styrene-b-N-isopropyl acrylamide) is prepared by living anionic polymerization with sequence addition of styrene followed by trimethylsilane-protected N-isopropyl acrylamide. The polymer was obtained by cleaving the trimethylsilane group by adding acidic methanol and precipitating into hexane.



Characterization:

The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the aromatic protons on styrene between about 6.5-7.5 ppm with the proton of NCH on NIPAM at 3.9 ppm. The PDI of block copolymer is determined by SEC.

Solubility:

Poly(styrene-b-N-isopropyl acrylamide) block copolymer is soluble in DMF.

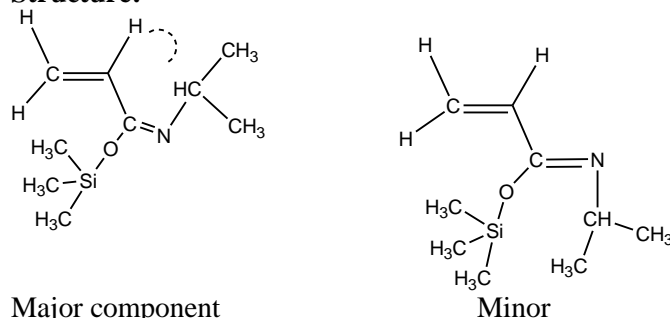
In THF it is soluble by warming the solution.

Sample Name:

N-isopropylacrylamide-TMS

Sample #: NIPAM-TMS (Lot# 14603)

Structure:



Major component

Component

2-isomeric species

Composition:

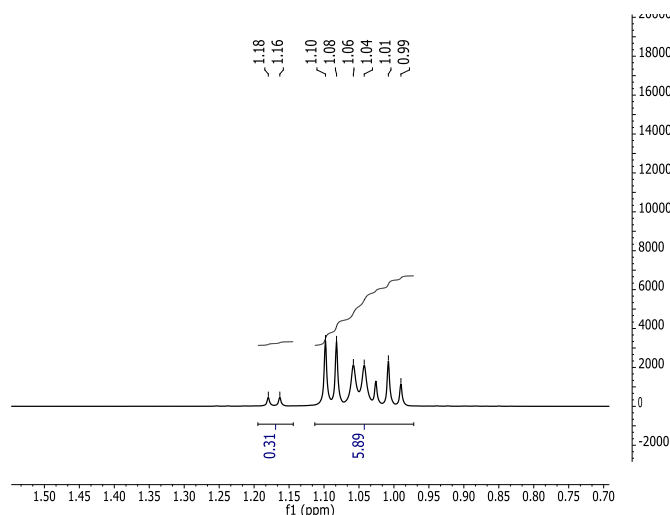
Mass	PDI
185	1
Purity	>98%

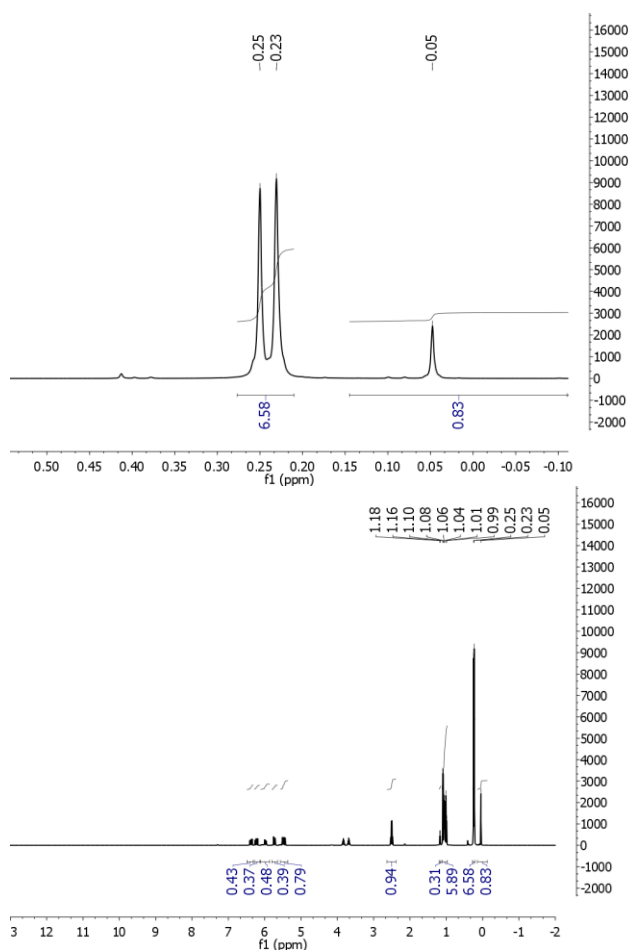
C₉H₁₉NOSi

Mol. Wt.: 185.3

C, 58.32; H, 10.33; N, 7.56; O, 8.63; Si, 15.15

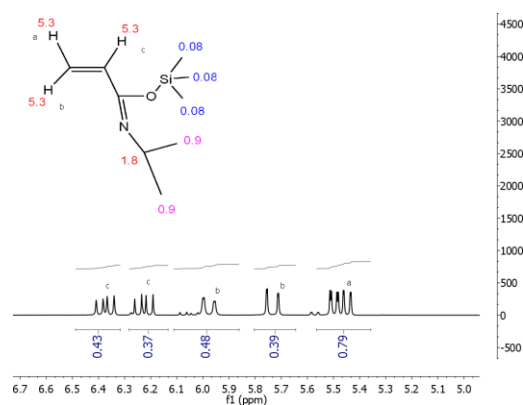
¹H-NMR Spectrum monomer:





^1H NMR of the TMS-NIPAM in CDCl_3 consist 2 sets of signals due to two isomers in the ratio of 1:0.8 ratio. Thus in the polymerization of TMS_NIPAM in toluene, one of the isomers exists predominately over the other.

Free radical polymerization of NIPAM_TMS and NIPAM using AIBN results in atactic polymer. The Polymerization of TMS-NIPAM with $\text{tBuLi}/\text{n(bu)}_3\text{Al}$ adduct results in isotactic rich polymer. m diad contents at 1.8ppm and 1.4 ppm (due to the presence of isomers in the monomer) is over 98%. The CH_2 (methylene) proton signals are observed clearly as split peaks typical of non-equivalent meso methylene groups as the major component with a minor signal observed between them, revealing high iso tacticity of the polymer.



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:

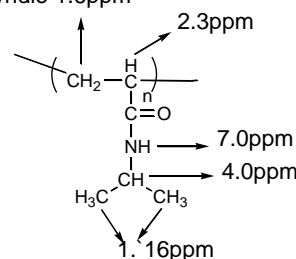
Isotactic rich polymer is only soluble in Hot DMF.

Chemical shifts :

(m) iso at 1.8ppm

(m) iso at 1.4 ppm

(r) Syndio 1.6ppm



^1H NMR spectrum of the block copolymer:

