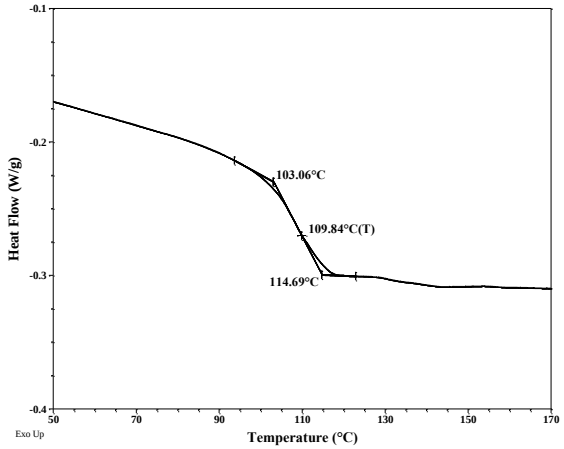
Sample Name: **Poly(N-isopropyl acrylamide), atactic (different tacticity ratio)**

Sample #: **P18068A-NIPAM**

Composition:

Mn x 10^3	PDI
1.7	1.5
Tg of polymer: 109 °C mid-point	
(S:H:Iso : 80:20:0)	

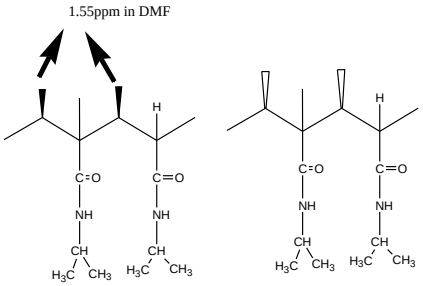


Synthesis:
Polymer is synthesized by anionic polymerization process using TMS protected NIPAM Monomer. Polymerization carried out in different solvents in the presence of ligands such as LiCl, diethyl Zinc, tri-isobutyl aluminium and diethyl aluminum.

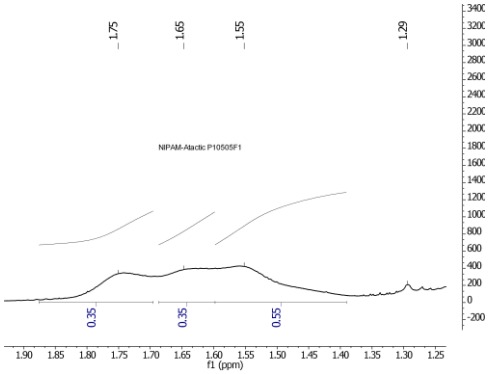
HNMR was carried out in DMF.
Following are the chemical shifts for different microstructures.

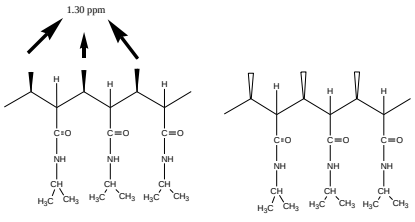
Solubility of Polymer: Solubility of poly NIPAM in water or in methanol dependent on the fraction of triad (mmm) iso contents presence in the polymer.

Solubility in different Solvents				
Water	Toluene	CH3OH	CHCl3	DMF
No	No	yes	Cloudy	yes
(mmm) triad contents %				
0				

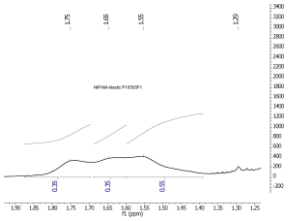


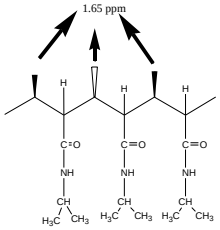
An example of meso diads



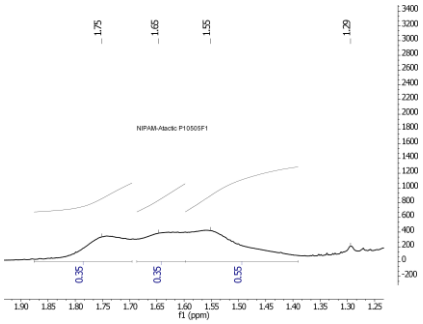


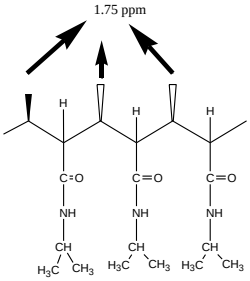
An example of meso triads



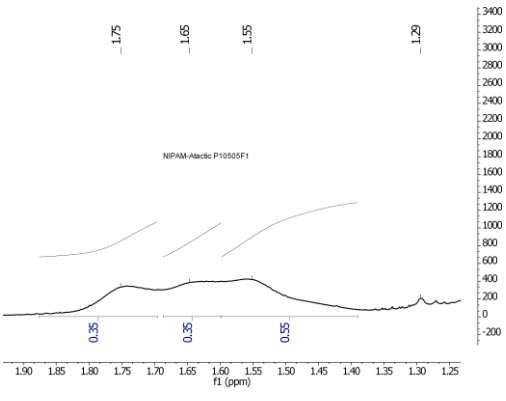


An example of Syndio (rrr) triads



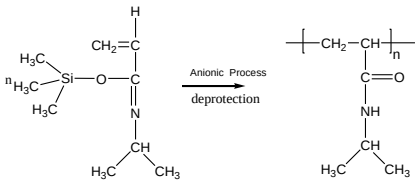


An example of hetero (rmmr) triads



Synthesis Procedure:

Poly(N-isopropyl acrylamide) is obtained by NH protected NIPAM monomer using ionic polymerization process.



characterization:

The molecular weight of poly(N-isopropyl acrylamide) are obtained by ^{1}H NMR carried out at 50 ^{o}C.

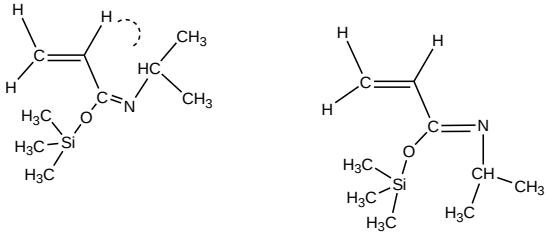
HNMR Of the monomer:

Sample Name:

N_isopropylacylamide-TMS

Sample #: **NIPAM-TMS (Lot# 14603)**

Structure:



Major component Minor Component

2-isomeric species

Composition:

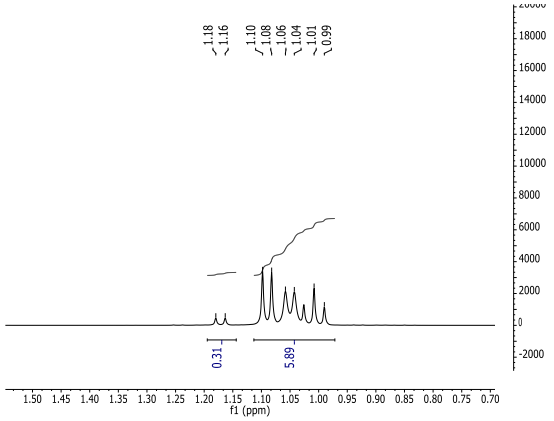
Mass	PDI
185	1
Purity	>98%

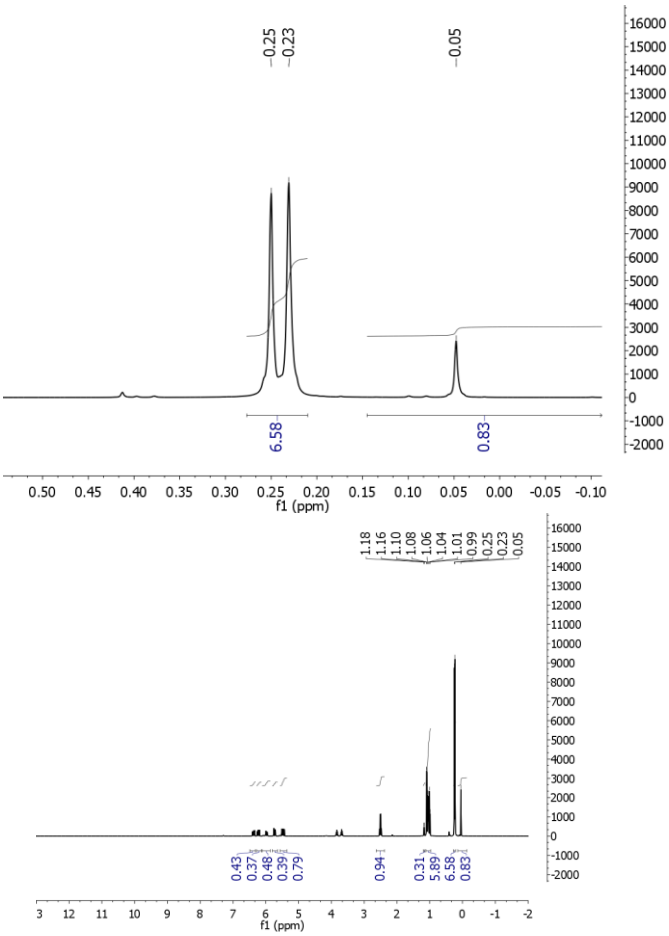
$C_9H_{19}NOSi$

Mol. Wt.: 185.3

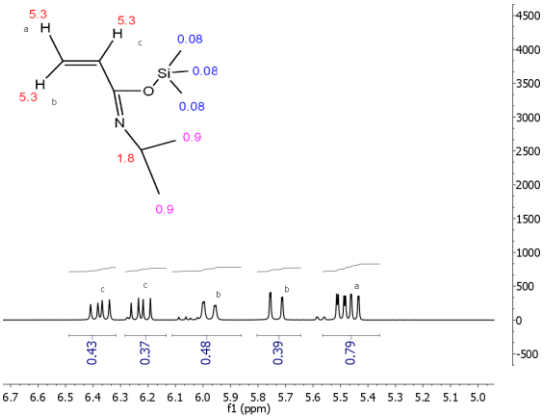
C, 58.32; H, 10.33; N, 7.56; O, 8.63; Si, 15.15

^{1}H-NMR Spectrum monomer:





HNMR of the TMS-NIPAM in Cdcl3 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.



Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10ºC/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).

GPC of the Polymer

^{1}H NMR of the Polymer carried out in DMF at 40 ºC: