

Sample Name: Poly (N-isopropyl acrylamide) bearing different tacticity

Sample#: P40074-NIPAM

Synthesis procedure:

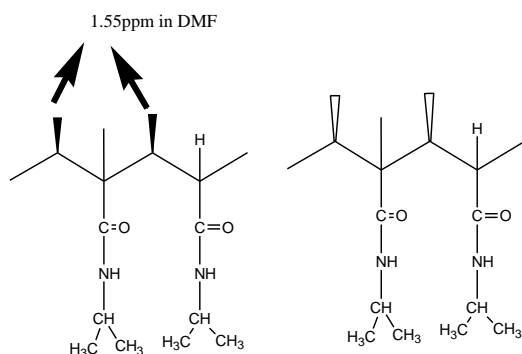
Polymer is synthesized by anionic polymerization process using TMS protected NIPAM Monomer. Polymerization carried out in different solvents in the presence of ligands such as LiCl, diethyl Zinc, tri isobutyl aluminium and diethyl aluminum.

Solubility:

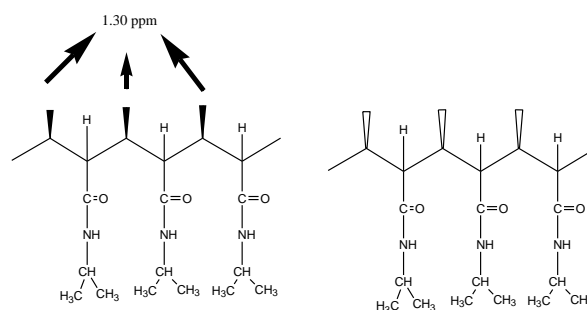
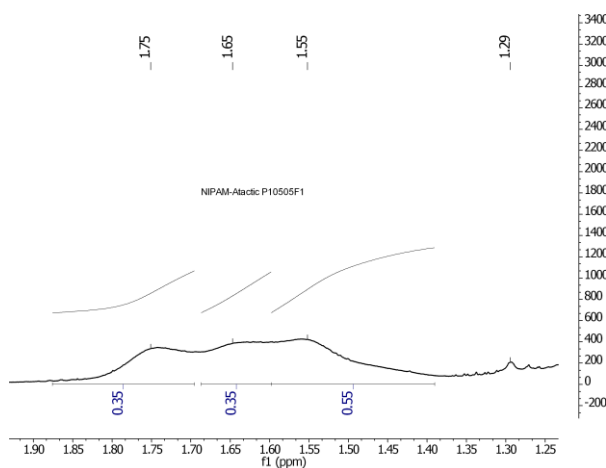
Solubility of poly NIPAM in water or in methanol dependent on the fraction of triad (mmm) iso contents presence in the polymer.

HNMR was carried out in DMF.

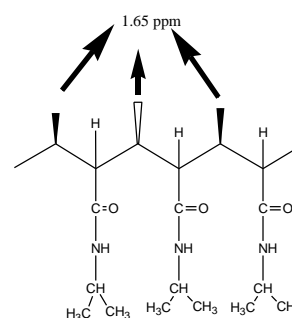
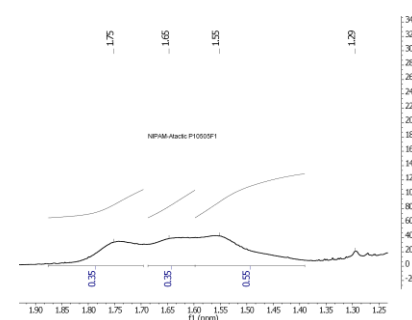
Following are the chemical shifts for different microstructures.



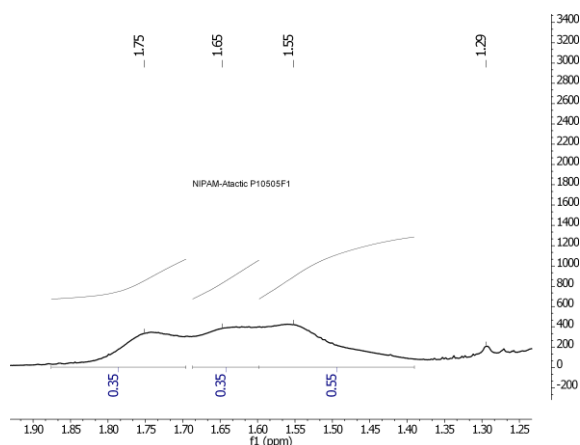
An example of meso diads

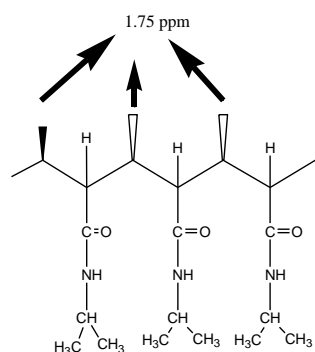


An example of meso triads

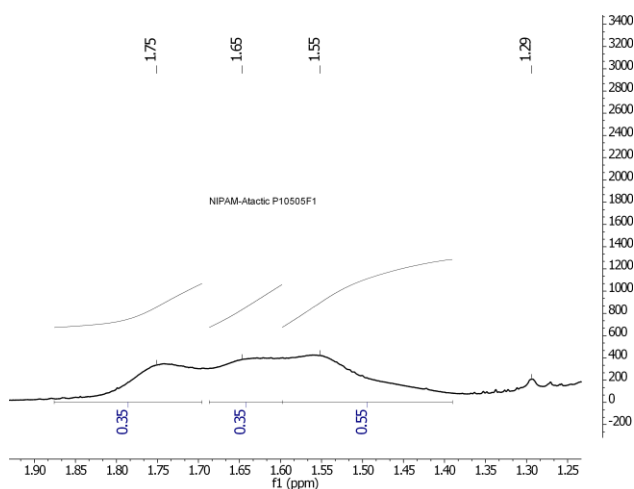


An example of Syndio (rrr) triads





An example of hetero (rmmr) triads



Polymer Sample#: P40074-NIPAM (S: H: Iso: 65:0:35)

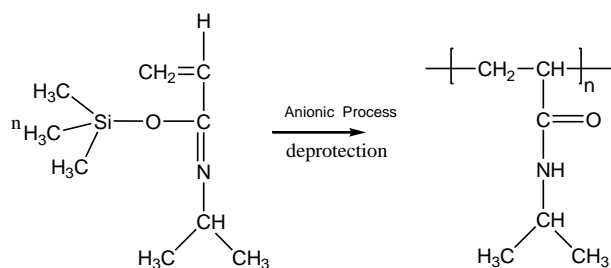
Molecular composition:

Mn x 10 ³	Mw x 10 ³	(mmm) triad content s %	Solubility in different Solvents				
			Water	Toluene	CH ₃ OH		
			CHCl ₃	DMF			
37.0	110.0	<2%	N	N	Y	Y	Y

Tg of polymer: 120 °C (mid point)

Synthesis Procedure:

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



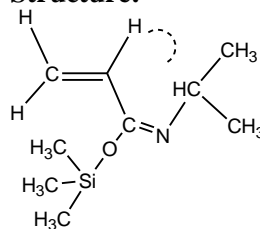
Characterization:

The molecular weight of poly (N-isopropyl acrylamide) is obtained by ¹H NMR carried out at 50 °C.

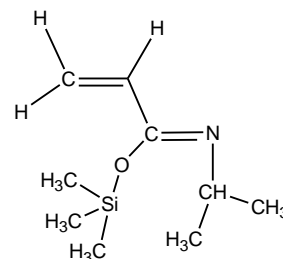
Sample Name: N_isopropylacrylamide-TMS

Sample #: NIPAM-TMS (Lot# 14603)

Structure:



Major component



Minor Component

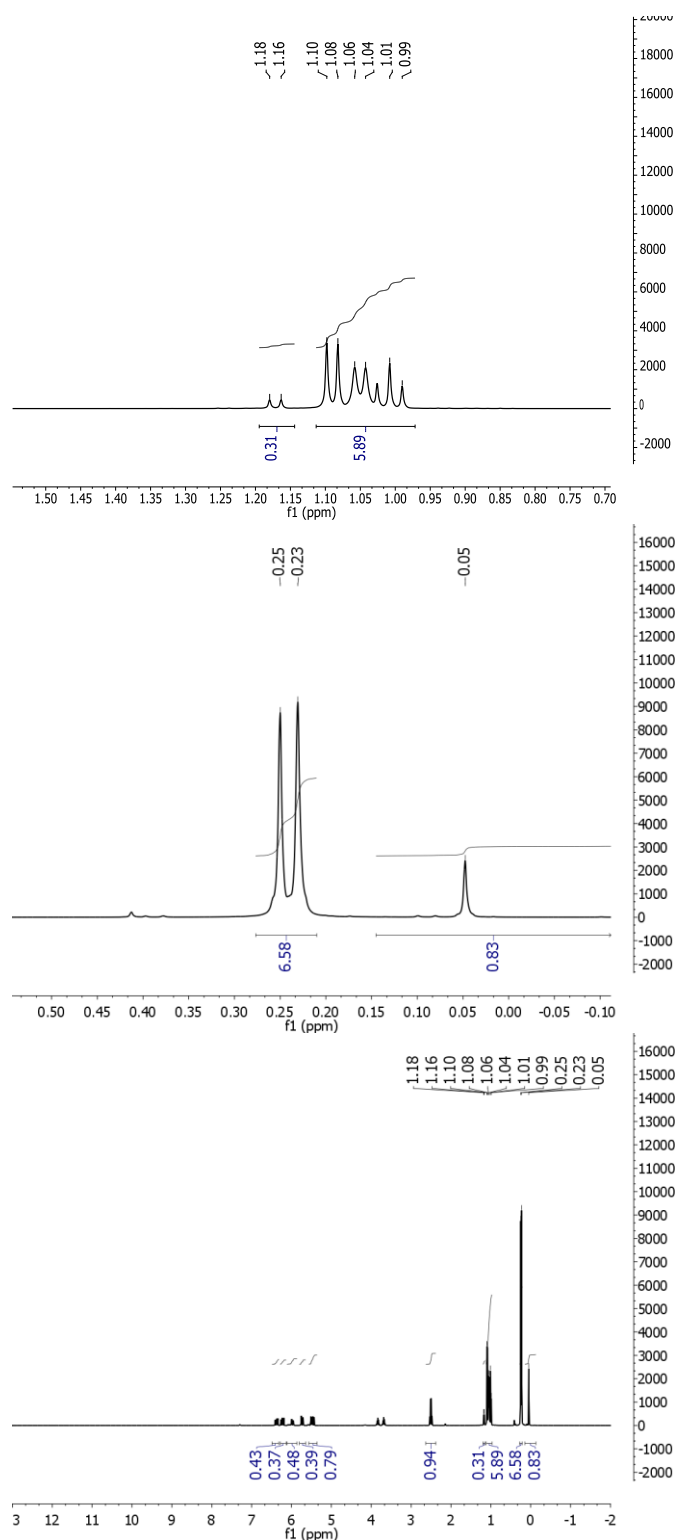
2-isomeric species

Composition:

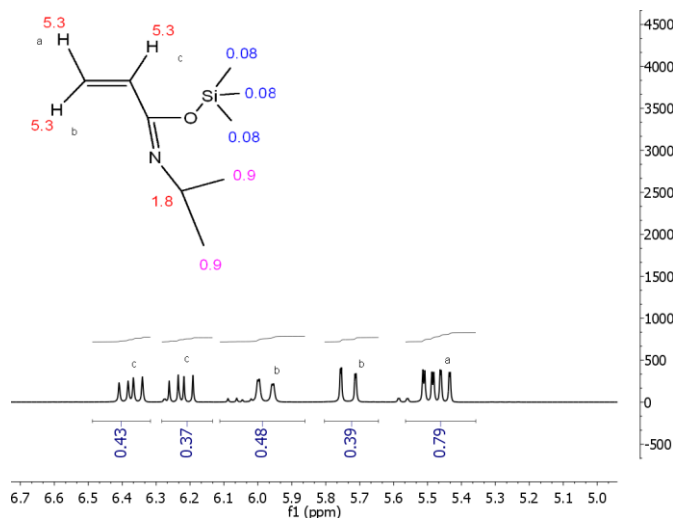
Mass	PDI
185	1
Purity	>98%

C₉H₁₉NOSi
Mol. Wt.: 185.3
C, 58.32; H, 10.33; N, 7.56; O, 8.63; Si, 15.15

¹H-NMR Spectrum monomer:



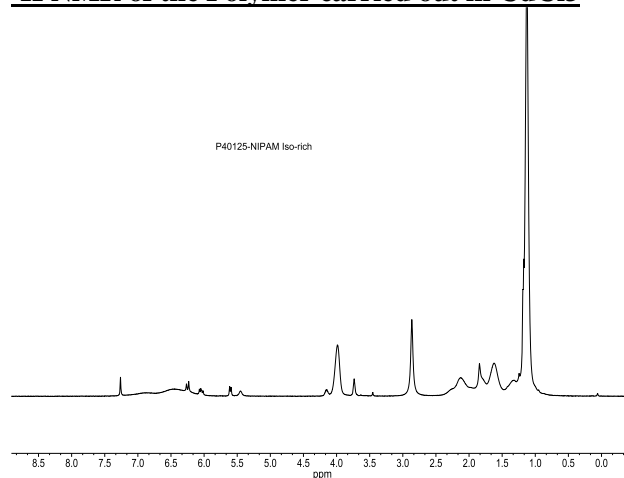
In the polymerization of TMS_NIPAM in toluene, therefore one of the isomers exists predominately over the other.



Thermal analysis:

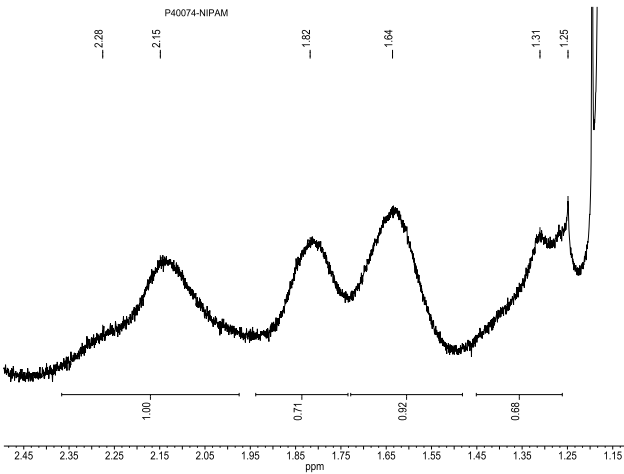
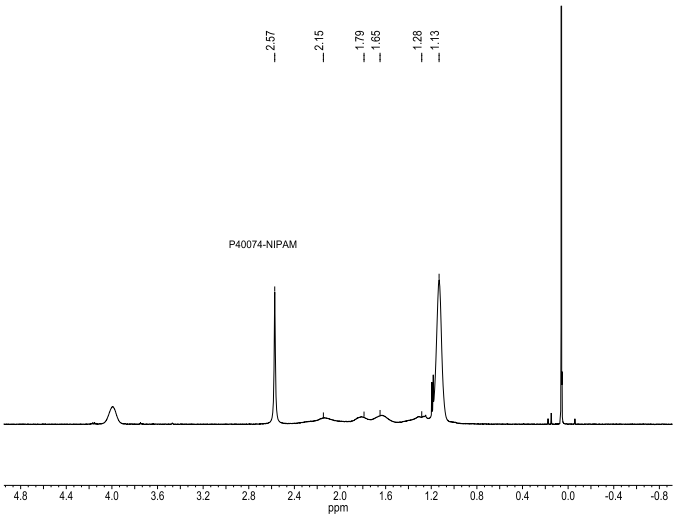
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

¹H NMR of the Polymer carried out in CdCl₃

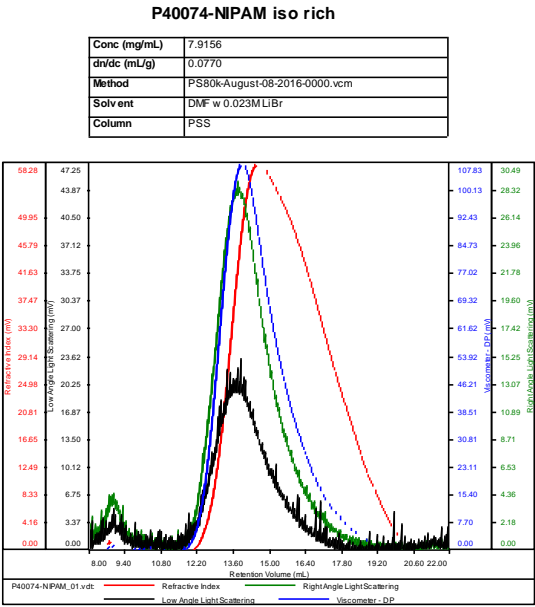


¹H-NMR of the TMS-NIPAM in CdCl₃ consist 2 sets of signals due to two isomers in the ratio of 1:0.8.

¹H NMR of the Polymer carried out in DMF:



GPC of the Polymer:



Sample	Mn	Mw	Mp	Mw/Mn	IV
P40074-NIPAM_01.vdt	36,747	110,971	117,170	3.020	0.4046

DSC thermogram for the polymer:

