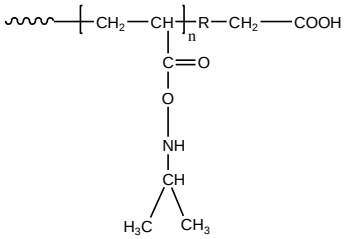
Sample Name: **Carboxy Terminated Poly(N-isopropyl acrylamide)**
Sample #: **P5588-NIPAMCOOH**

Structure:



Composition:

Mn x 10^3	PDI
42.0	1.4

Synthesis Procedure:

Carboxy Terminated Poly(N-isopropyl acrylamide) was prepared by free-radical polymerization of N-isopropyl acrylamide with a carboxyl group containing chain transfer agent.

Purification of polymer:

Unreacted monomer was removed by dissolving the product in cold water than warming up the solution. The polymer separated out. This procedure was applied 2 times to remove the unreacted monomer. The obtained polymer was dissolved in acetone and reprecipitated in cold ether.

Characterization:

Size exclusion chromatography (SEC) was carried out on a Varian liquid chromatograph equipped with a refractive index detector. A Shodex 806L GPC columns from Supelco was used with DMF(0.01M LiBr) as the eluent and also in THF following the procedure as out lined in **Macromolecules, 2000,33,6738.** To avoid the effect of concentration and the amount of water present in the sample, on line triple detectors were used and the dn /dc was calculated and found : 0.104mL/g in THF at 35 oC The columns were calibrated with monodisperse polystyrene standards. The polydispersity index was calculated.

Viscosity measurement was carried out in a Ubbelohde viscometer at 25°C. Four solutions in methanol of different concentrations were measured. The intrinsic viscosity was obtained by extrapolation to c=0. From viscosity-molecular weight relationship $[\eta]= 2.99\times10^{-2}\ M^{0.64}$ (Makromolecular Chem. V180, P969, 1979), the viscosity average molecular weight was calculated accordingly.

It is important that the values of molecular weights determined in DMF and in THF were found quite different. It might be possible that end functionalized polymer might be present in the form of aggregates and gives much highr values than determined by viscosity data. (data arereported in the following Table with respect to polystyrene as reference material).

In DMF Mn (Mw/Mn)	In THF Mn (Mw/Mn)	Molecular weight by titration	**Mv** by Viscosity
170,000(1.4)	22000(1.4)	42000	73000

From the above results we have consider the titration and the viscosity values were found comparable.

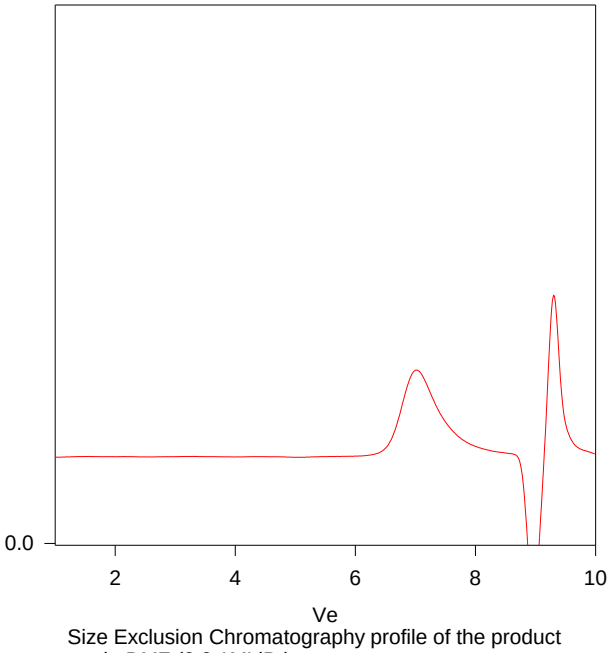
Molecular weight of the product is reported by end group titration by acid base process.

Solubility:

The polymer is soluble in methanol, cold water, THF, CHCl3.

SEC of Sample: Run in DMF

P5588-NIPAMCOOH



Size Exclusion Chromatography profile of the product run in DMF (0.0.1MLiBr)
Carboxy terminated Poly(N-isopropyl acrylamide)

M_n= 42000 by Titration: Mw/Mn by SEC=1.4
Mn w.r.t Polystyrene: 170,000