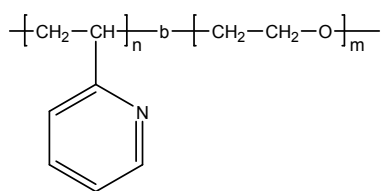Sample Name: **Poly(2-vinyl pyridine -b- ethylene oxide)**

Sample #: **P3023-2VPEO**

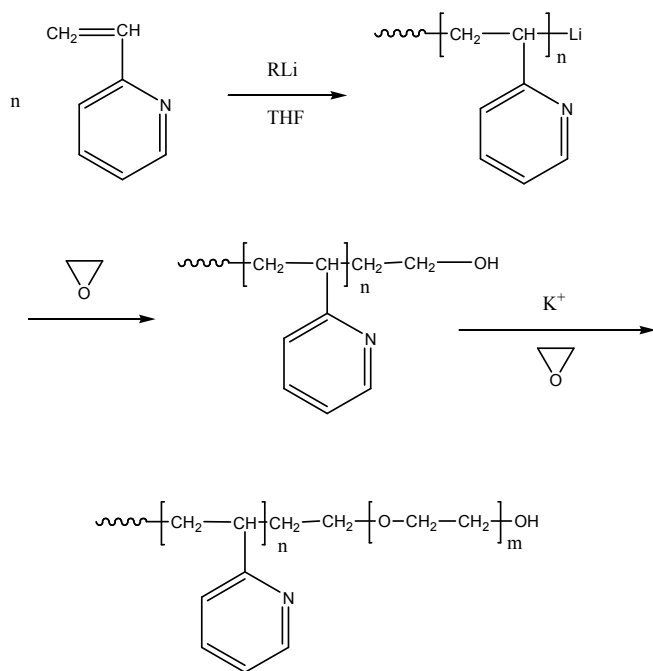## Structure:

Composition:

Mn x 10^3 P2VP-b-PEO	PDI
2.5-b-2.4	1.18

Synthesis Procedure:

Poly (2-vinyl pyridine -b- ethylene oxide) is prepared by living anionic polymerization of ethylene oxide using potassium salt of hydroxyl terminated poly(2-vinyl pyridine) as a macro-initiator. The reaction scheme is shown below:
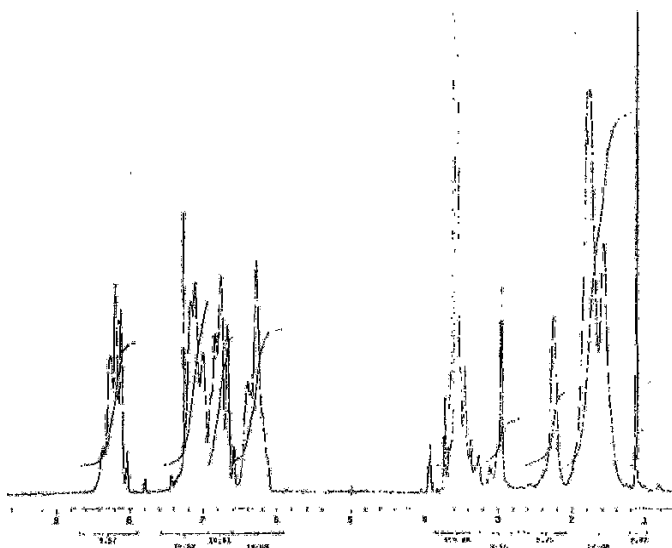

Characterization:

An aliquot of the hydroxyl terminated poly(2-vinyl pyridine) was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the 2-vinyl pyridine proton at about 8.2 ppm with the peak area of the ethylene oxide protons at about 3.6 ppm. Block copolymer PDI is determined by SEC.
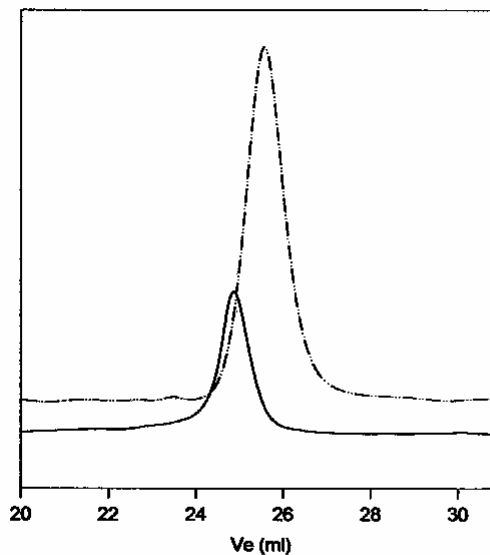
Solubility:

Poly(2-vinyl pyridine -b- ethylene oxide) is soluble in ethanol, DMF, chloroform, and THF. Hexanes are its non-solvent.

^{1}H-NMR Spectrum of the block copolymer:

SEC of the block copolymer:

P3023-2VPEO

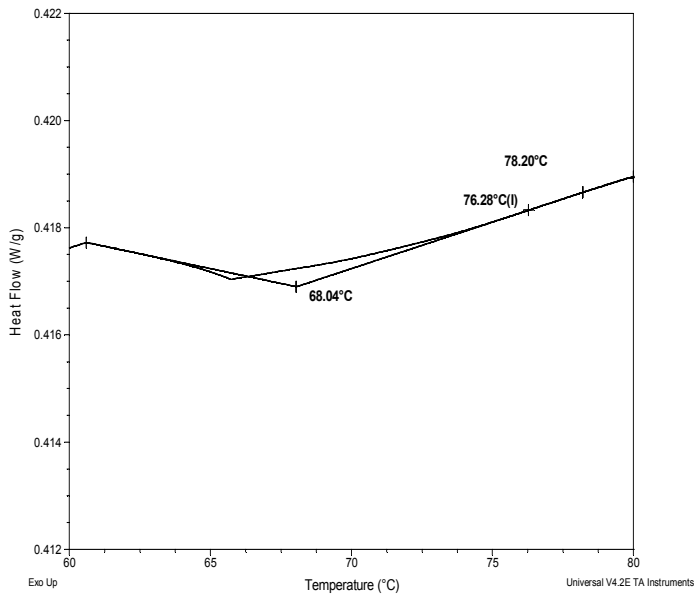Size exclusion chromatography of poly(2-vinylpyridine)-b-poly(ethylene oxide):
----- Poly(2-vinylpyridine), M_n=2500, M_w=2900, PI=1.17
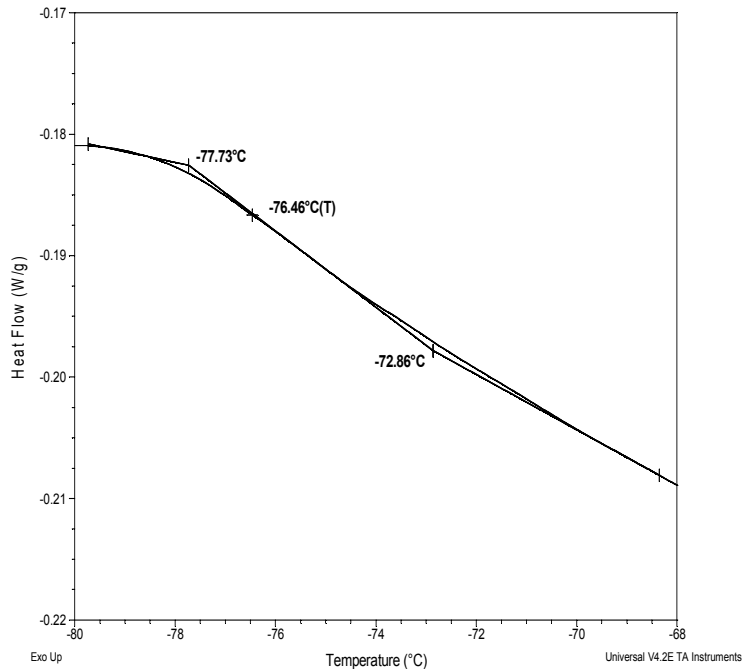----- Block Copolymer P2VP(25000)-b-PEO(2400), PI=1.18

Thermal analysis of the sample# P3023-2VPEO

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°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).

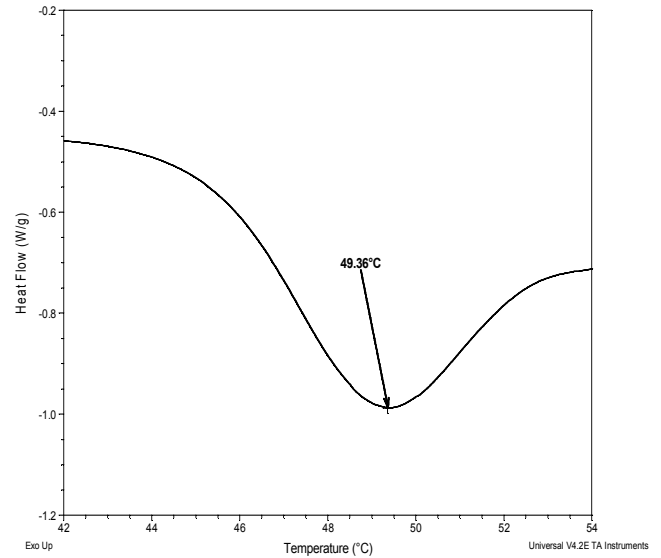**Thermogram for 2VP block:**

Thermogram for PEO block:

Thermal analysis results at a glance

For 2VP block		
T_g: 76°C	T_m: -	T_c: -
For PEO block		
T_g: -76°C	T_m: 49°C	T_c: 37°C

Melting and crystallization curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

Melting curve for PEO block:

Crystallization curve For PEO block