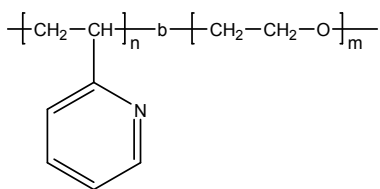


Sample Name: Poly(2-vinyl pyridine -b- ethylene oxide)

Sample #: P2492-2VPEO

**Structure:**

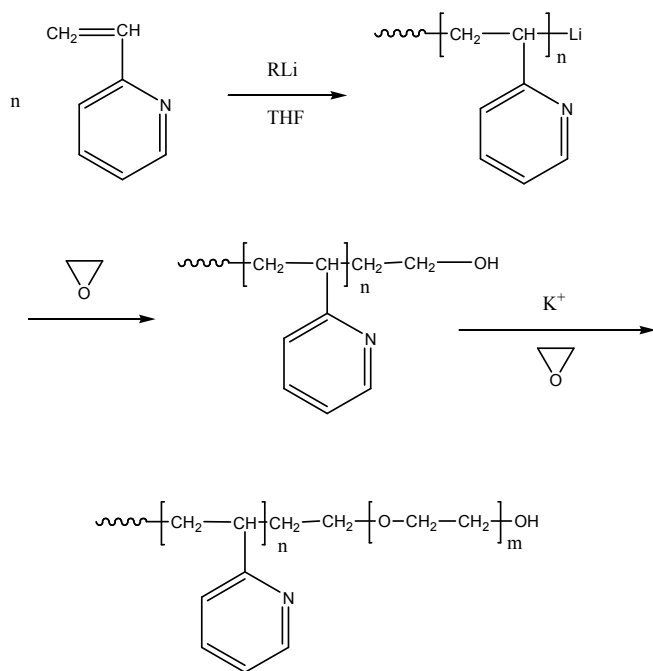


**Composition:**

Mn x 10 <sup>3</sup> P2VP-b-PEO	PDI
13.5-b-21.0	1.1

**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:



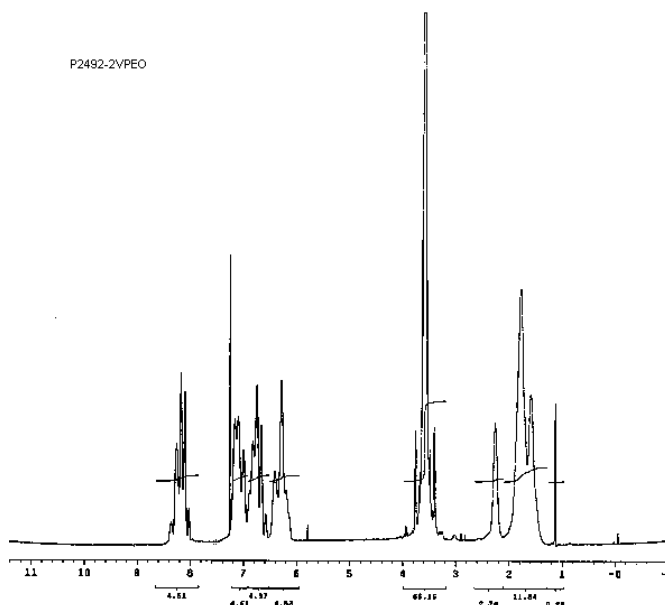
**Characterization:**

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 <sup>1</sup>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:**

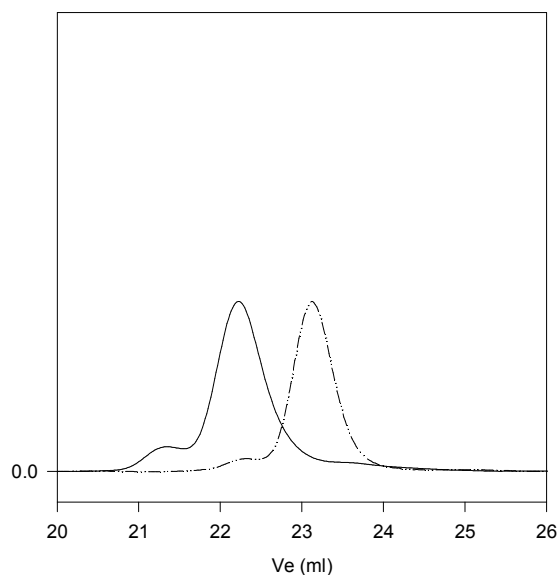
Poly(2-vinyl pyridine -b- ethylene oxide) is soluble in ethanol, DMF, chloroform, and THF. Hexanes are its non-solvent.

**<sup>1</sup>H-NMR Spectrum of the block copolymer:**



**SEC of the block copolymer:**

**P2492-2VPEO**



Size exclusion chromatography of poly(2-vinylpyridine)-b-poly(ethylene oxide):

- OH terminated poly(2-vinylpyridine), M<sub>n</sub>=13500, M<sub>w</sub>=15000, PI=1.11
- Block Copolymer P2VP(13500)-b-PEO(14500), PI=1.11

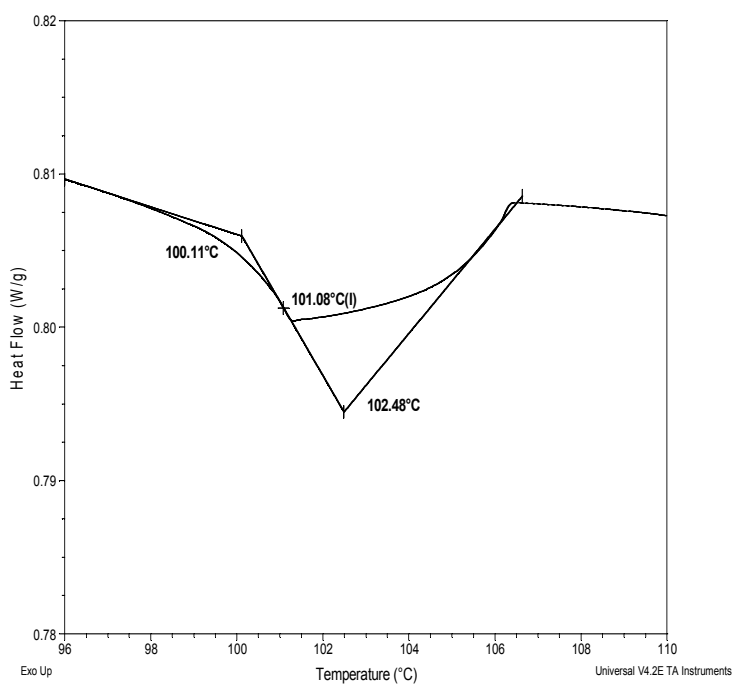
## Thermal analysis of the sample# P2492-2VPEO

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 ( $T_g$ ).

### Thermal analysis results at a glance

For 2VP block		
$T_g$ : 101°C	$T_m$ : -	$T_c$ : -
For PEO block		
$T_g$ : Not distinct	$T_m$ : 56°C	$T_c$ : 36°C

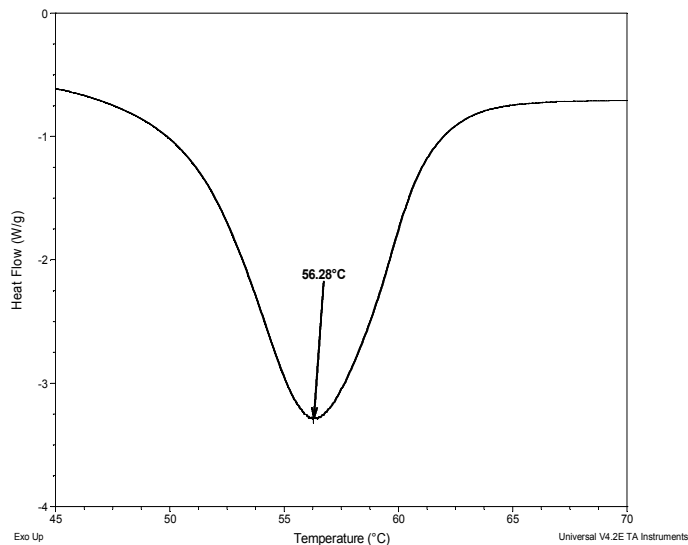
### Thermogram for 2VP block:



### 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

