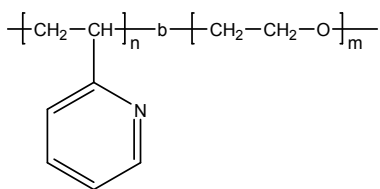


Sample Name: Poly(2-vinyl pyridine -b- ethylene oxide)

Sample #: P3026-2VPEO

Structure:

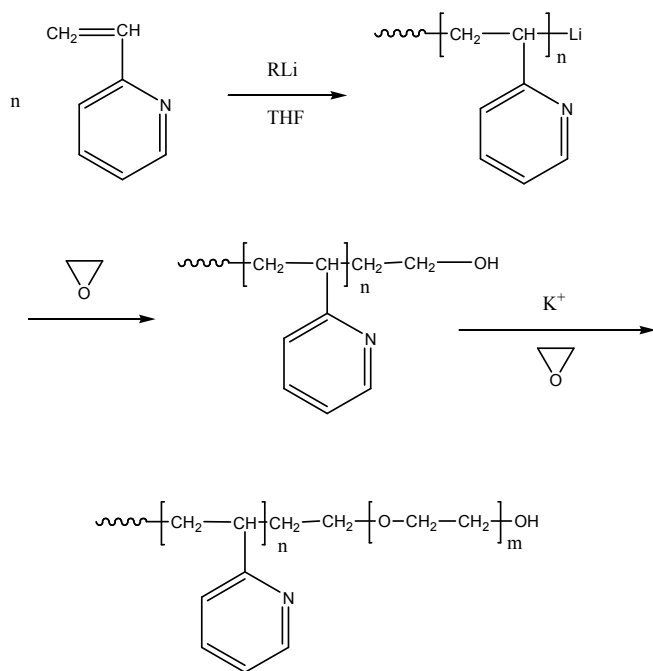


Composition:

Mn x 10 ³ P2VP-b-PEO	PDI
4.3-b-4.2	1.07

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:



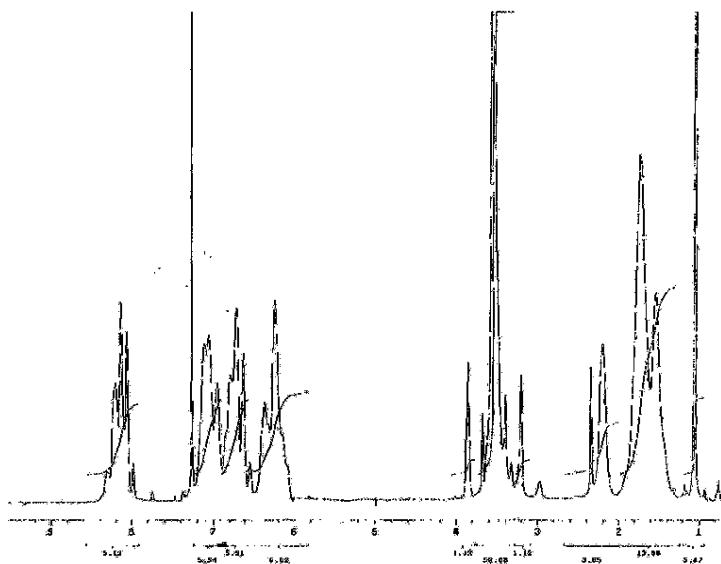
Characterization:

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 ¹H-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:

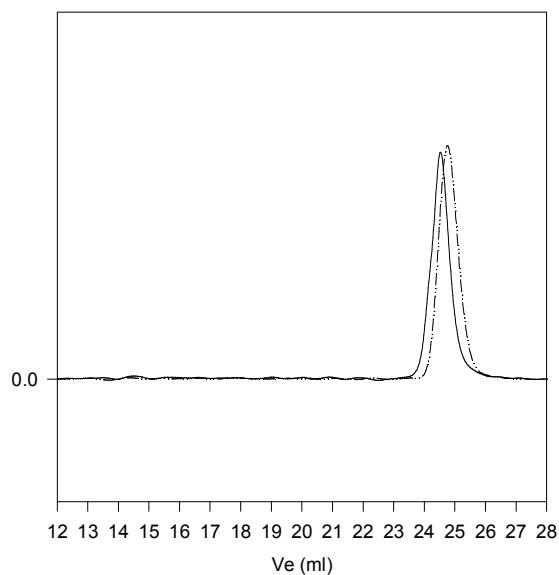
Poly(2-vinyl pyridine -b- ethylene oxide) is soluble in ethanol, DMF, chloroform, and THF. Hexanes are its non-solvent.

¹H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:

P3026-2VPEO



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

- Poly(2-vinylpyridine), M_n=4300, M_w=4600, PI=1.07
- Block Copolymer P2VP(4300)-b-PEO(4200), PI=1.06 (Composition from ¹H NMR)

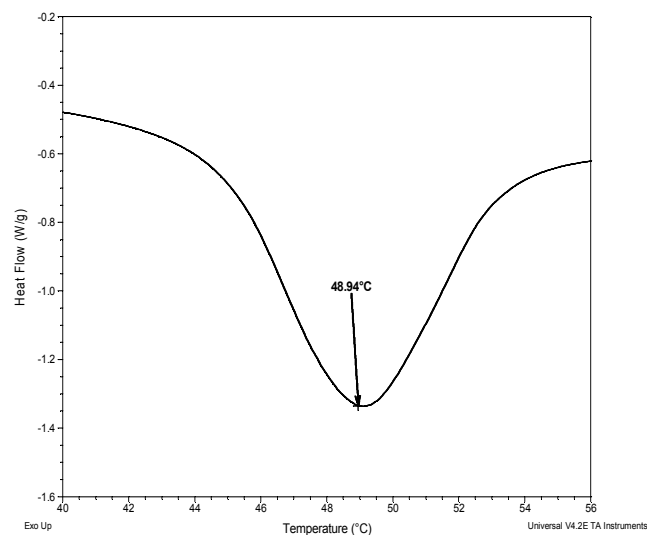
Thermal analysis results at a glance

For 2VP block		
T_g : 87°C	T_m : -	T_c : -
For PEO block		
T_g : -76°C	T_m : 49°C	T_c : 35°C

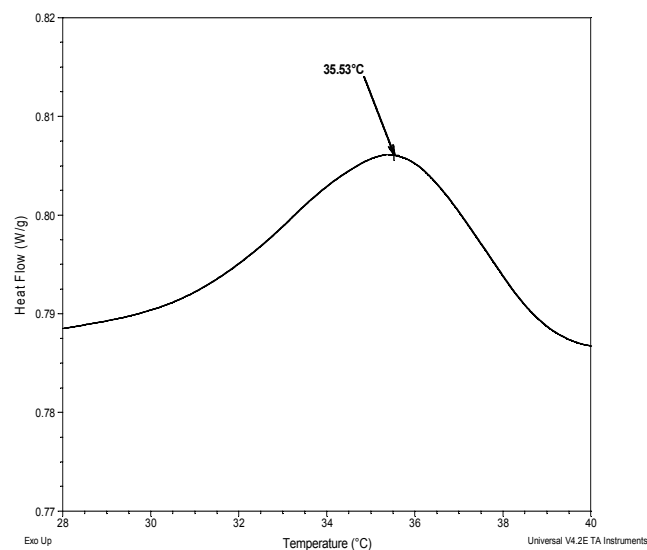
Melting and crystallization curve for the sample

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:



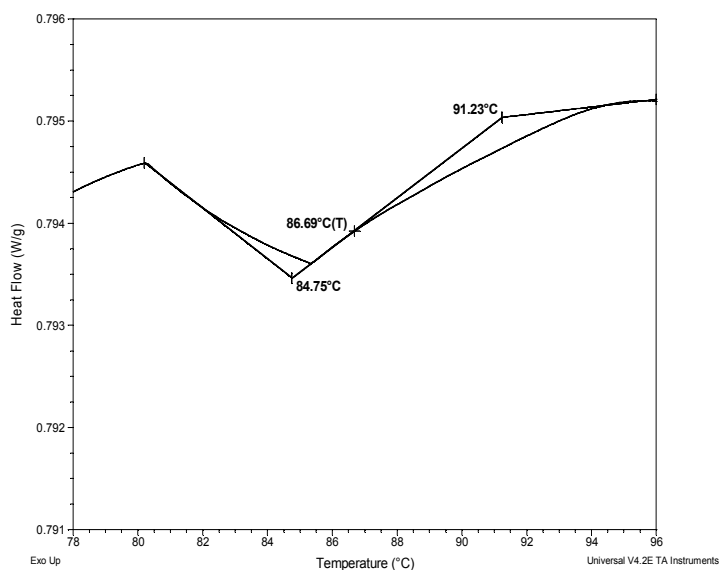
Crystallization curve For PEO block



Thermal analysis of the sample# P3026-2VP EO

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:

