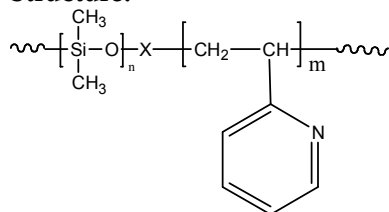


Sample Name: Poly(2-vinyl pyridine-b-dimethylsiloxane)

Sample #: P53842VPDMS

By anionic polymerization process

Structure:



Composition:

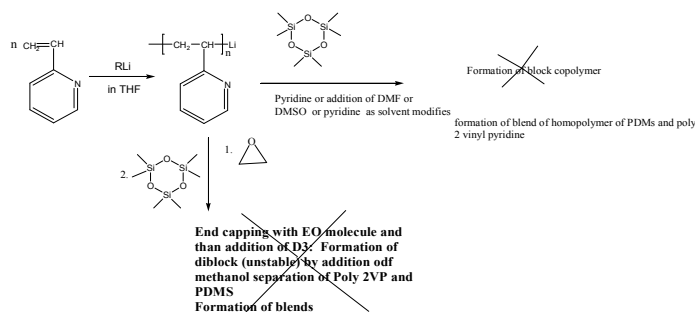
| | |
|--------------------------------|---------------------|
| $M_n \times 10^3$ 2VP-b-DMS | M_w/M_n |
| 4.2-b-45.0 | 1.3 (In toluene) |

Synthesis Procedure:

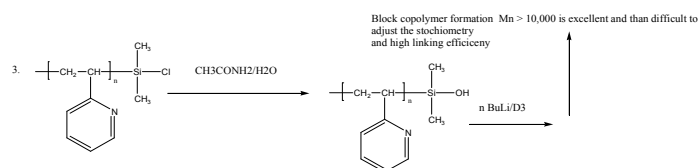
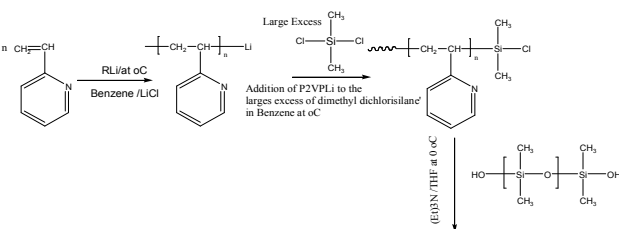
Poly(2-vinyl pyridine-b-dimethylsiloxane) is synthesized by one of the following routes.

Different routes for the synthesis of poly 2 vinyl pyridine with polydimethyl siloxane:

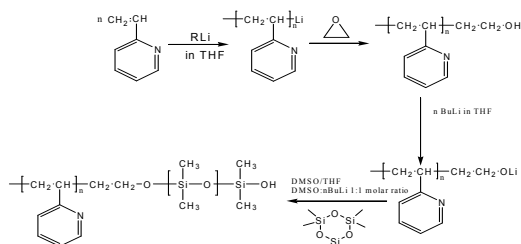
1. Direct Anionic Polymerization by sequential addition of 2VP followed by D3 monomer



2. From the linking reaction of end functionalized polymer: For the synthesis of Block copolymer > Mn 10,000

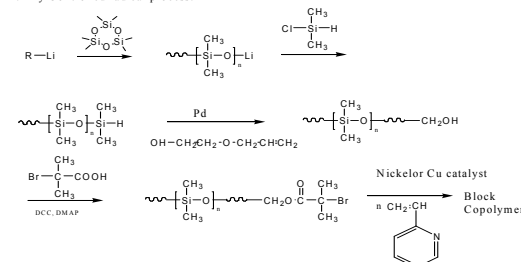


3. Formation of first Poly 2vinyl pyridine OH terminated polymer than reacting the isolated P2VPOH polymer with n BuLi followed by addition of D3 in the presence of DMSO equimolar amount with nBuLi



High purity diblock copolymer formation

4. By Controlled radical process:



Characterization:

Polymers were analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from $^1\text{H-NMR}$ spectroscopy by comparing the peak area of the 2-vinyl pyridine proton at about 8.2 ppm with the dimethyl siloxane protons at 0.08 ppm. Copolymer PDI is determined by SEC.

Thermal analysis:

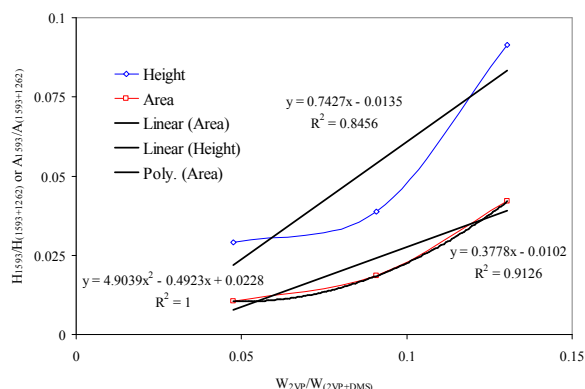
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^\circ\text{C}/\text{min}$. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g). The melting temperature (T_m) of the DMS was taken as the maximum of the endothermic peak in the thermogram.

Solubility:

Poly(2-vinyl pyridine-b-dimethyl siloxane) is soluble in THF, CHCl_3 and toluene.

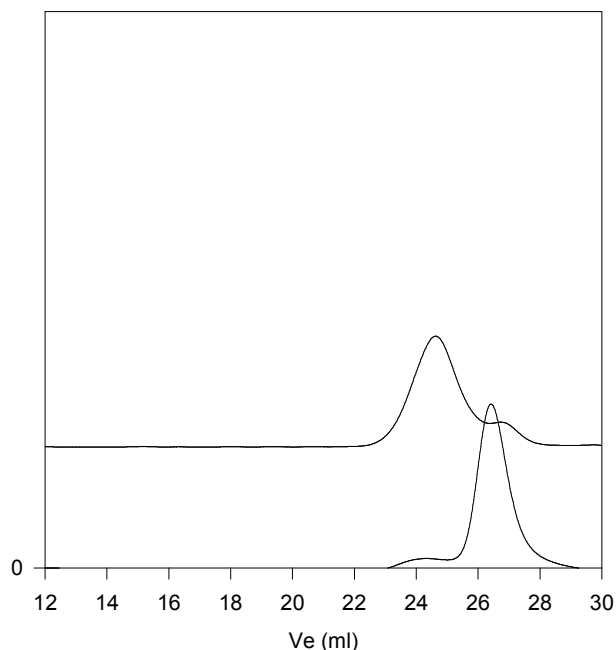
FTIR: Com,position of the Polymer also checked by FTIR:

Relationship between weight fraction & FTIR peak area of 2VP in DMS



SEC for the polymer:

P5384-2VPDMS

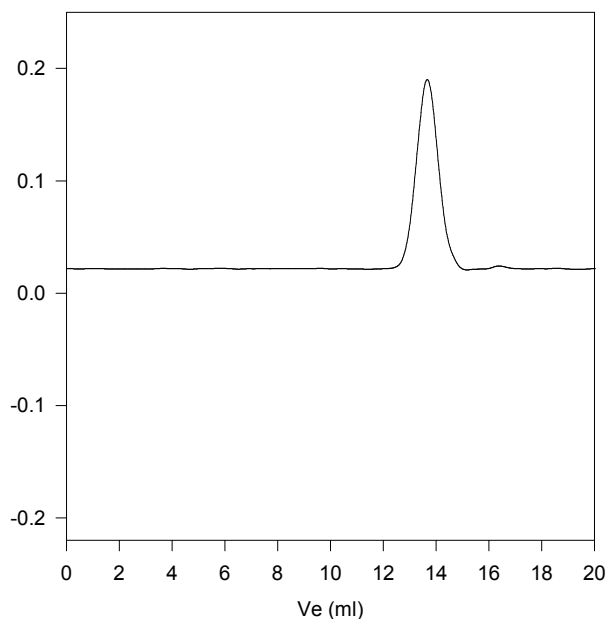


Size exclusion chromatography of

- Poly(2VP)OH terminated, $M_n = 4200$ Mw: 4700 Mw/Mn 1.12
 - Block Copolymer P2VP(4200)-b-PDMS(45000), PI= 1.35
- Composition for ^1H NMR

SEC carried out for the final product in Toluene:

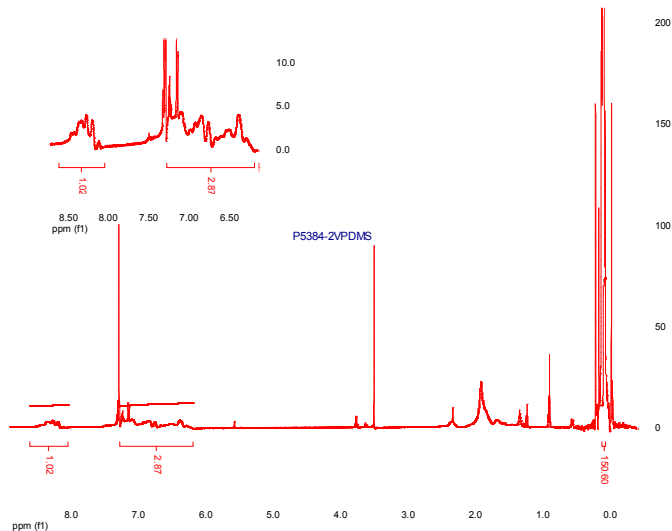
P5384-2VPDMS in toluene



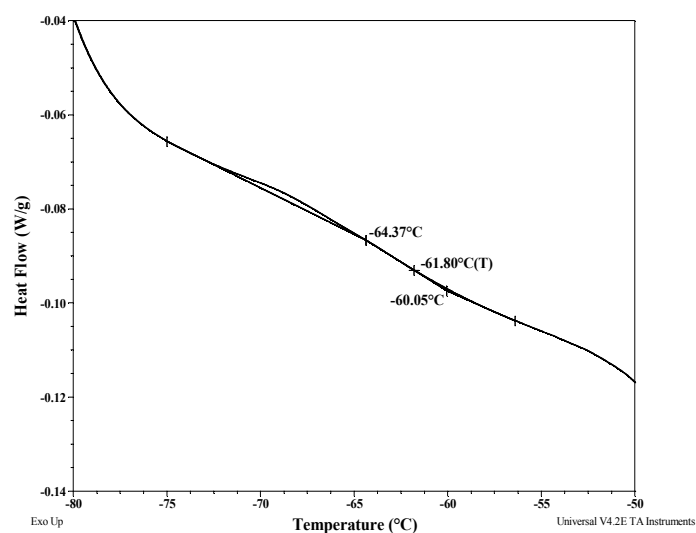
Size exclusion chromatography of the final polymer in Toluene

- Block Copolymer P2VP(2500)-b-PDMS(45000), PI= 1.3
- Composition for ^1H NMR

^1H NMR for the polymer:



Thermogram for DMS block:



Melting curve for DMS block:

