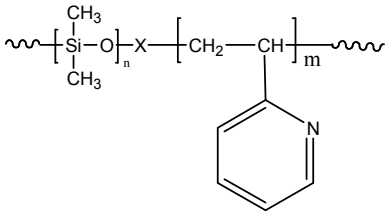
Sample Name: Poly(2-vinyl pyridine-b-dimethylsiloxane)

Sample #: P10464-2VPDMS

By controlled radical process

Structure:



Composition:

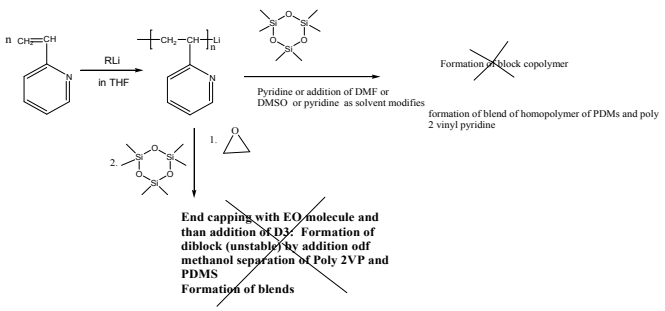
$Mn \times 10^3$ 2VP-b-DMS	Mw/Mn
17.0-b-10.0	1.28

Synthesis Procedure:

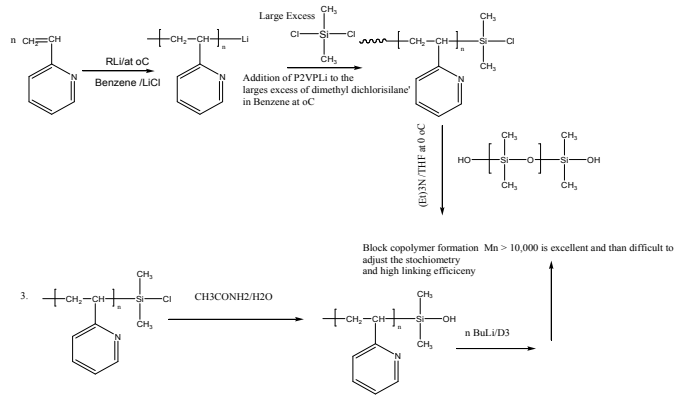
Poly(2-vinyl pyridine-b-dimethylsiloxane) is synthesized by one of the following routes.

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

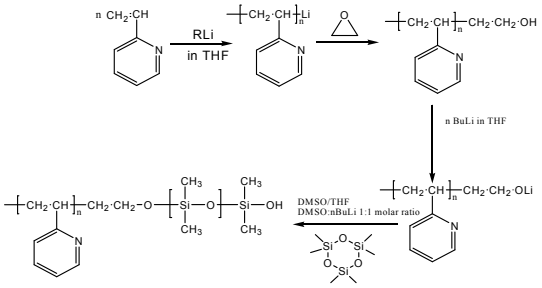
1. Direct Anionic Polymerization by sequential addition of 2VP followed by D3 monomer



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

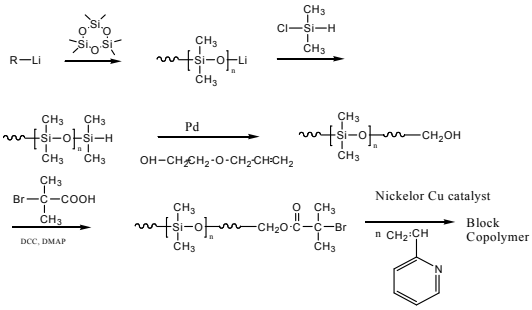


3. Formation of first Poly 2vinyl pyridine OH terminated polymer than reacting the isolated P2VPOH polymer with n BuLi foolwed by addition of D3 in the presence of DMSO equimolar amount with nBuLi



High purity diblock copolymer formation

4. By Controlled radical process:



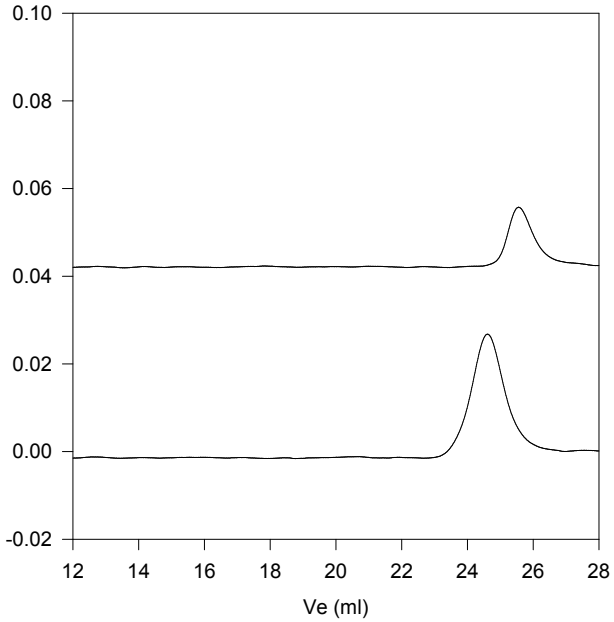
Characterization:

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}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.

Solubility:

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

P10464-2VPDMS



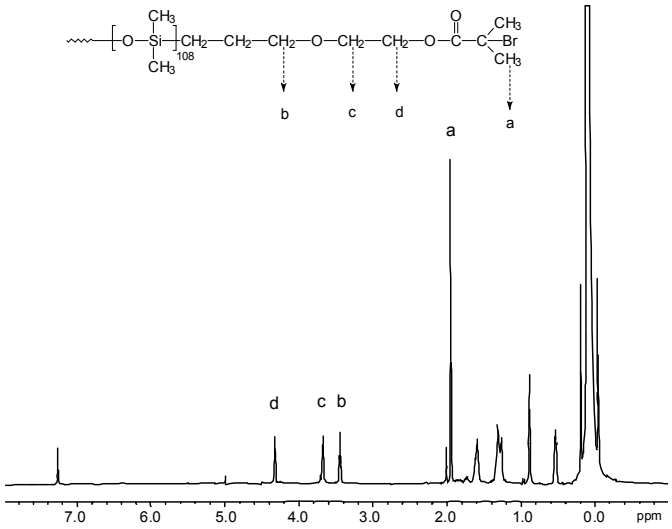
Size exclusion chromatography of

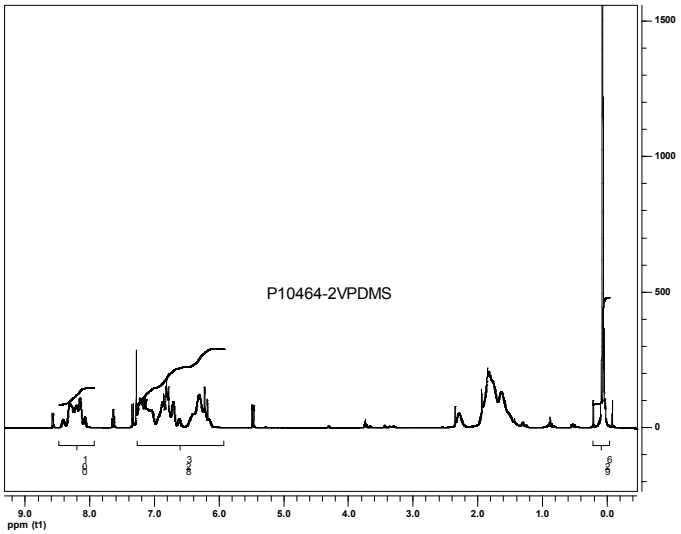
—— Poly(dimethylsiloxane), M_n=10000 Mw: 10900 Mw/Mn 1.09

—— Block Copolymer P2VP(17000)-b-PDMS(10000), PI= 1.28

Composition for ^{H} NMR

^{H}NMR for the polymer:





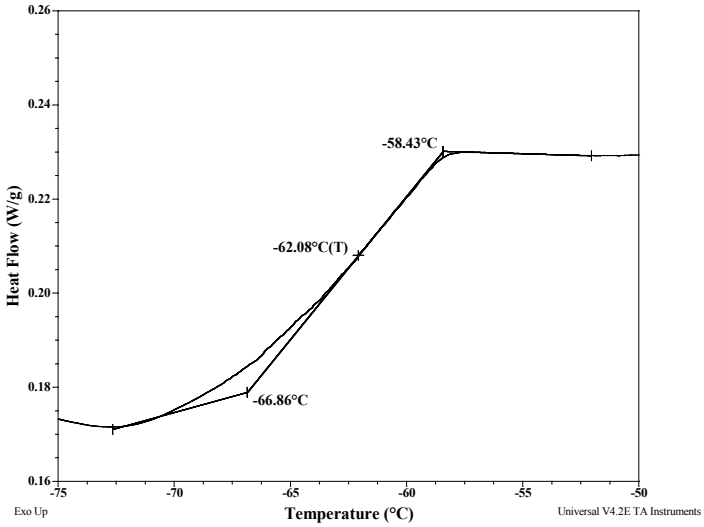
Thermal analysis of the sample P10464-2VPDMS

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10^{o}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). The melting temperature (T_m) of the DMS was taken as the maximum of the endothermic peak in the thermogram.

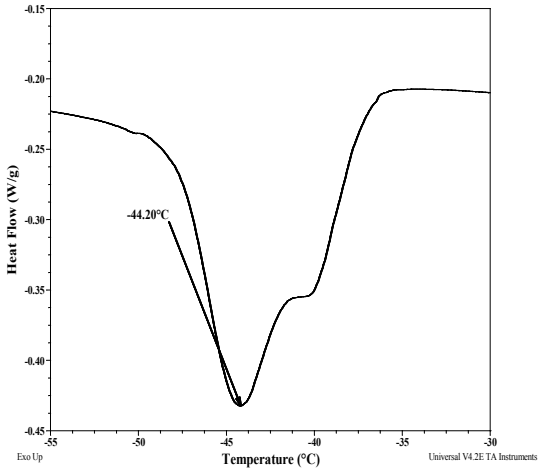
Thermal analysis results at a glance

Sample	T_m (^{o}C)	T_c (^{o}C)	T_g (^{o}C)
2VP	-	-	90
DMS	-44	-	-62

Thermogram for DMS block:



Melting curve for DMS block:



Thermogram for 2VP block: