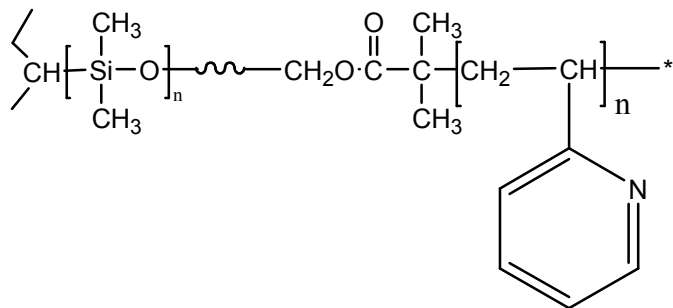


Sample Name: Poly(2-vinyl pyridine-b-dimethylsiloxane)

Sample #: P9176-2VPDMS

By controlled radical process

Structure:



Composition:

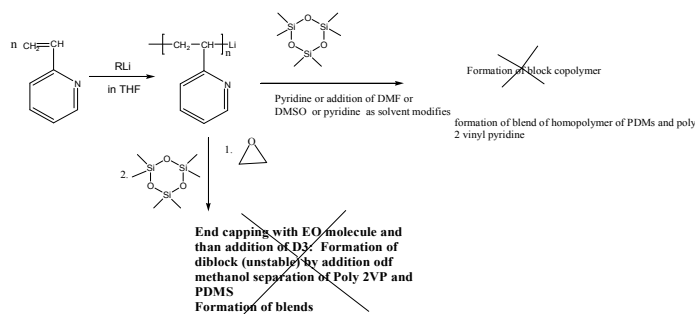
$M_n \times 10^3$ 2VP-b-DMS	M_w/M_n
3.8-b-33.0	1.19

Synthesis Procedure:

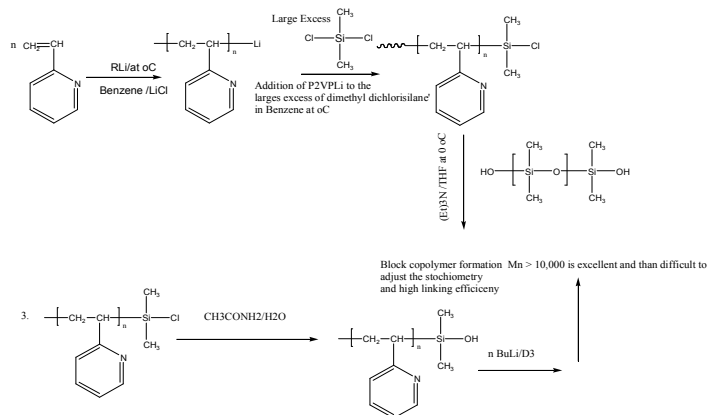
Poly(2-vinyl pyridine-b-dimethylsiloxane) is synthesized by one of the following routes.

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

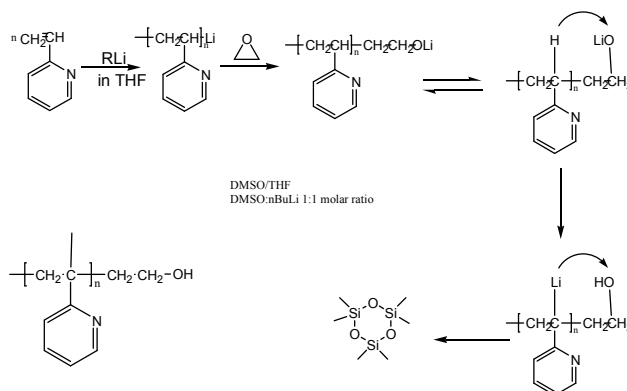
1. Direct Anionic Polymerization by sequential addition of 2VP followed by D3 monomer



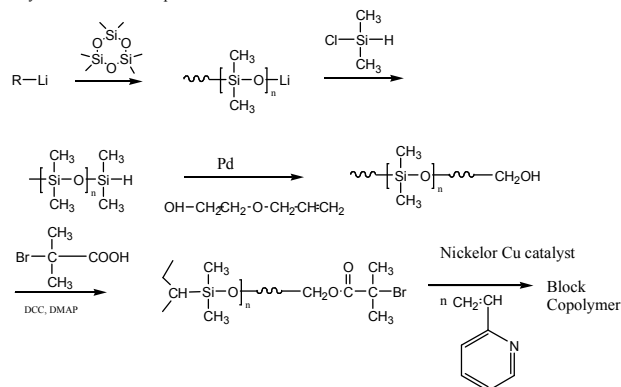
2. From the linking reaction of end functionalized polymer: For the synthesis of Block copolymer > Mn 10,000



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



4. By Controlled radical process:



Characterization:

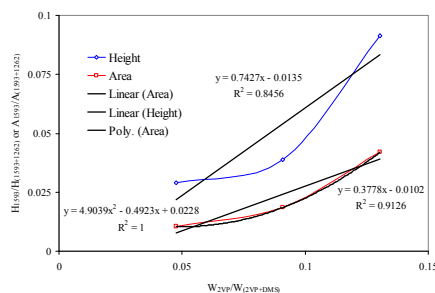
Polymers were analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from ¹H-NMR spectroscopy by comparing the peak area of the 2-vinyl pyridine proton at about 8.2 ppm with the dimethyl siloxane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

FTIR: The Composition of the polymer were also checked by FTIR.

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



Solubility:

Poly(2-vinyl pyridine-b-dimethyl siloxane) is soluble in THF, CHCl₃ and toluene.

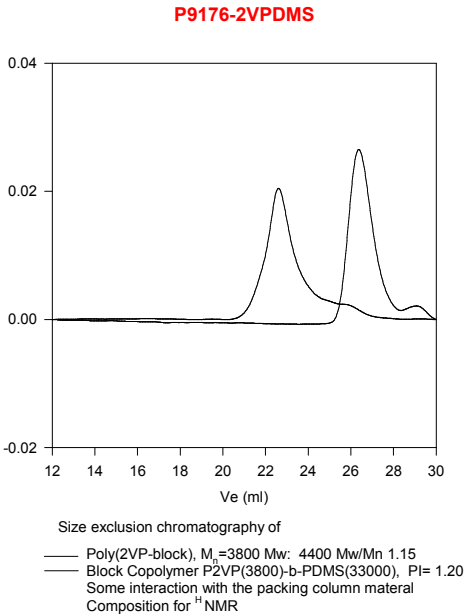
Thermal analysis results at a glance

Sample	T _m (°C)	T _c (°C)	T _g (°C)
2VP	-	-	77

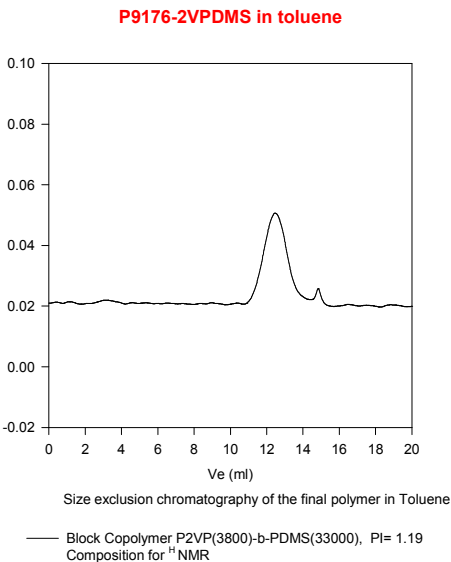
DMS	-40	-	-62

Contd. in next page

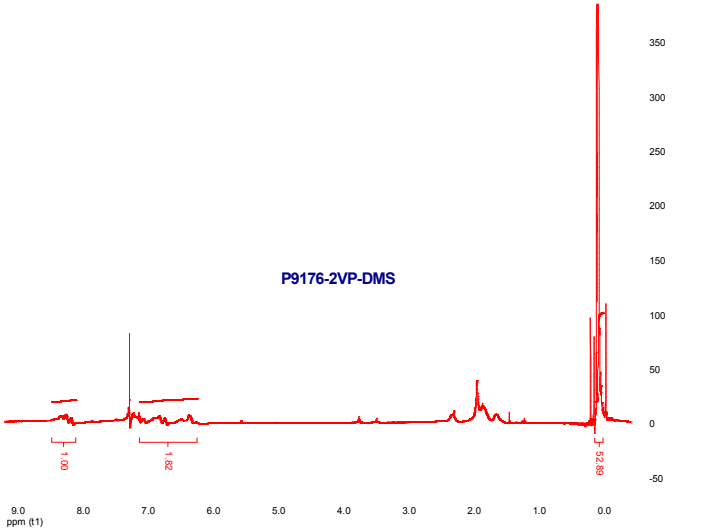
SEC for the polymer:



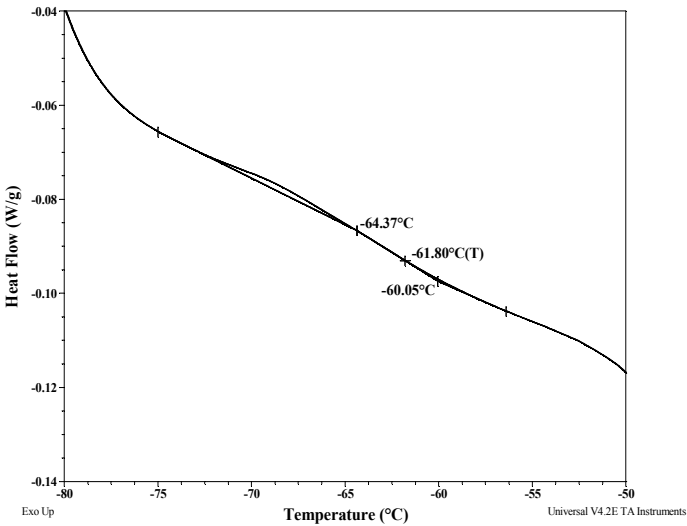
SEC of the Final Polymer in Toluene:



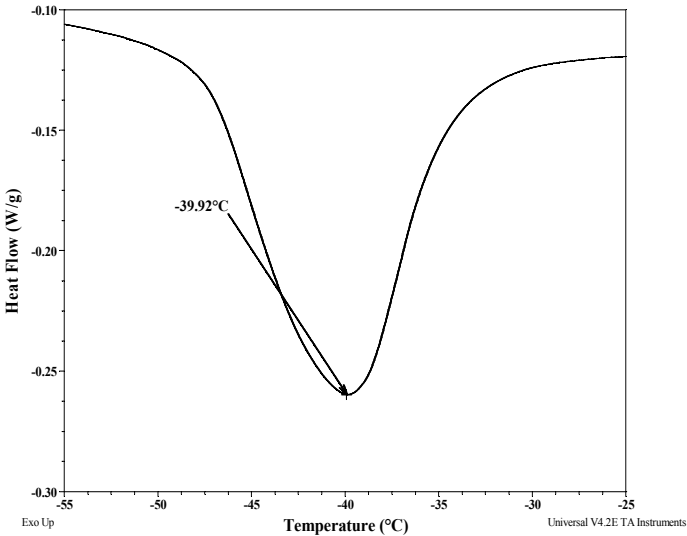
^1H NMR for the polymer:



Thermogram for DMS block:



Melting curve for DMS block:



Thermogram for 2VP block:

