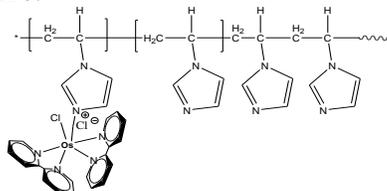


**Sample Name:** Poly(N-vinyl imidazole, quaternized with bis[2,2-bipyridine-N,N']-Osmium(II) complex)

**Sample #:** P44925-VIMDZQ-Osmium  
**Structure:**

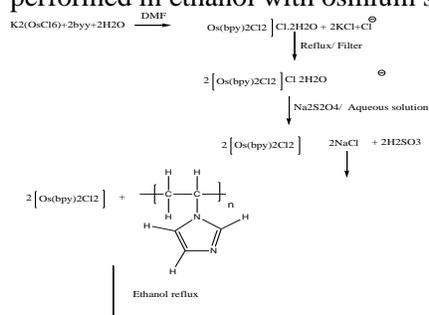


**Composition:**

Mn x 10 <sup>3</sup> of VIMDZ	PDI
8.3	1.5
Degree of quaternization is ~ 25%	

**Synthesis Procedure:**

Poly (N-vinyl imidazole) is synthesized by free-radical polymerization in toluene using AIBN as the initiator. The partial quaternization was performed in ethanol with osmium salt.



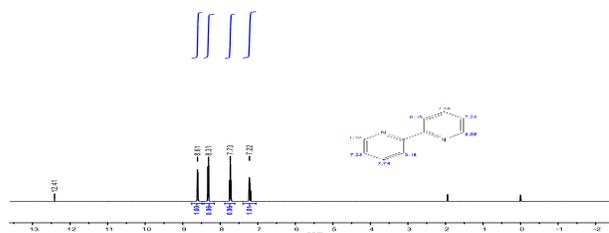
**Characterization:**

The molecular weight and polydispersity index (PDI) of Poly (N-vinyl imidazole) are obtained by size exclusion chromatography using water with 0.1%TFA and 0.2M NaCl as eluent. The degree of quaternization is calculated based on the results of element analysis. NMR spectrum was recorded on Varian 500 in deuterated DMF.

**Solubility:**

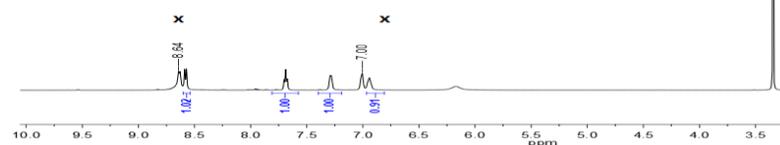
Polymer is soluble in methanol and ethanol. Toluene is non-solvent.

**HNMR spectrum of Cis(bis(2,2-bipyridine – N,N-) dichloroosmium (II) salt- Lot # P44438- OS salt:**

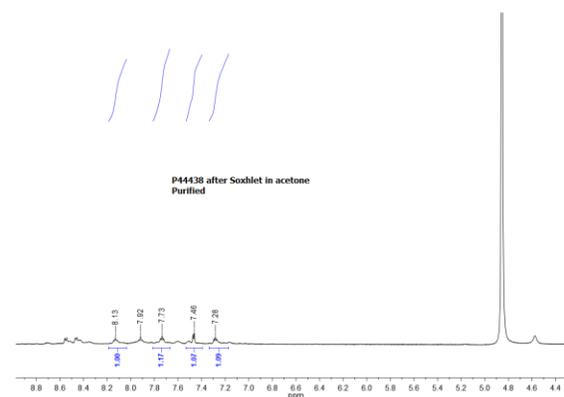


P44438-OS Bipyridine complex- crude run in DMSO

8.64 and 7.00 from unreacted Bipyridine



**HNMR spectrum of Cis(bis(2,2-bipyridine – N,N-) dichloroosmium (II) salt after Soxhlet in Acetone:**

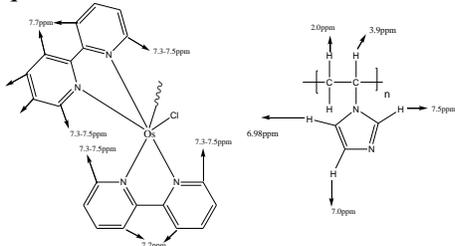


**Purification of the polymer after quaternization with bis (2,2-bipyridine-N,N') Osmium dichloride complex (Osmium (II)):**

Polymer recovers from hexane and dried and Soxhlet for 3 days with Benzene. The traces amount of unreacted Osmium 2, 2 bipyridine dichloride separated out from the polymer. Salt being soluble in benzene while the complex polymer is insoluble in benzene.

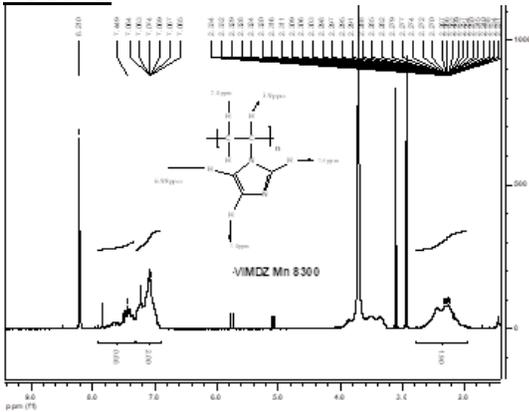
**Degree of quaternization:**

From the yield of the polymer after reaction with osmium salt was calculated and found the % of quaternization was 25%.

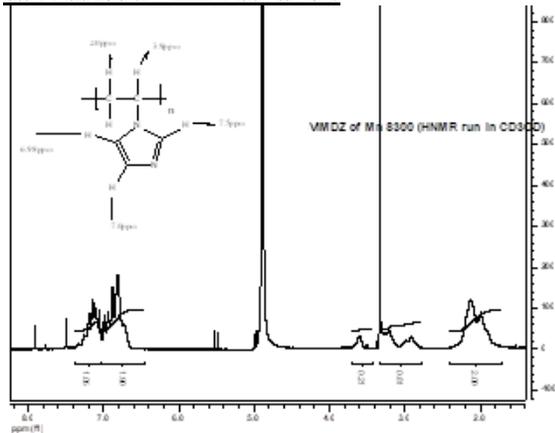


HNMR of the polymer after quaternization also illustrates about 25% degree of quaternization with osmium salt. FTIR also illustrates absorbance due to Osmium salt at 1256 and 1116cm<sup>-1</sup>.

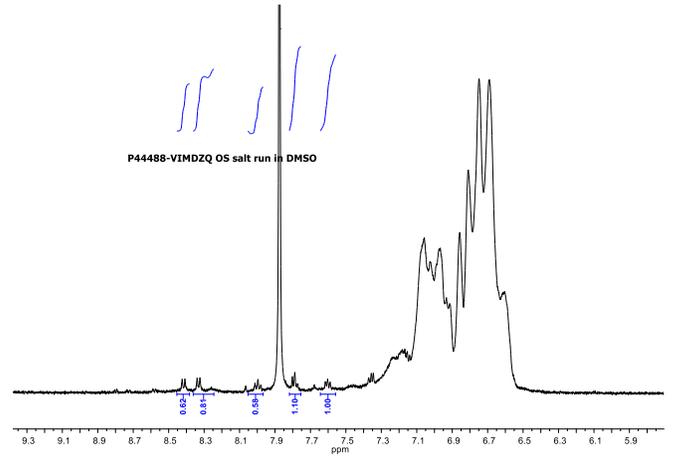
**H NMR spectrum of Poly vinyl imidazole runs in DMF:**



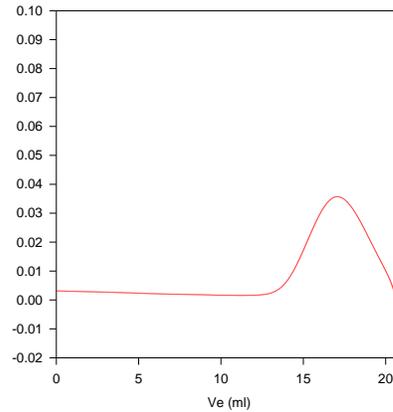
**H NMR spectrum of Poly vinyl imidazole carried out in Methanol:**



**HNMR spectrum of Sample:**



**SEC profile of Homopolymer (before quaternization):**



Size exclusion chromatography of poly(vinylimidazole) with respect to quaternized poly (2 vinyl pyridine) standards: Eluent: Water with 0.1% trifluoroacetic acid and 0.2M NaCl M<sub>n</sub>=8300 M<sub>w</sub>=12500, PI=1.50

