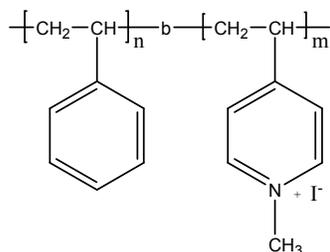


Sample Name: Poly(styrene-*b*- N-methyl 4-vinyl pyridine iodide)

Sample #: P4561-S4VPQ

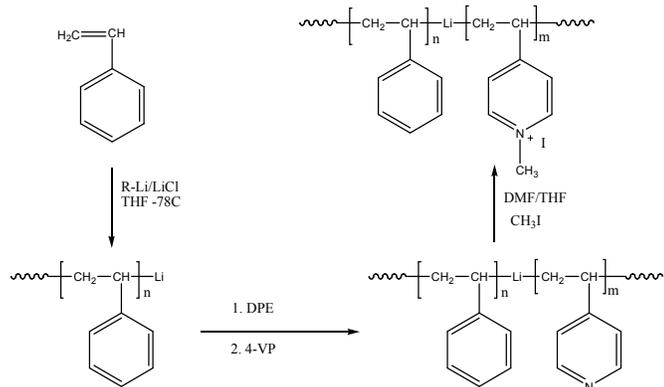


Composition:

| | |
|---|--|
| Mn x 10 ³ PS- <i>b</i> -P4VPQ | PDI |
| 25- <i>b</i> -16 | 1.10 |
| T _g for PS block: 108°C | T _g for 4VPQ block: Not found |

Synthesis Procedure:

Poly(styrene-*b*-4-vinyl pyridine) is prepared by living anionic polymerization in THF or THF-DMF solvent mixtures at -78 °C. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding 4-vinylpyridine (4VP) monomer. For further details please see our published articles.^{1,2} The scheme of the reaction is illustrated below:

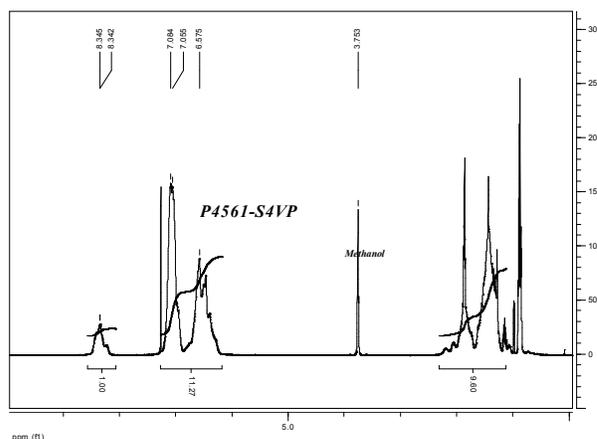


Characterization:

Polymer was analyzed by size exclusion chromatography (SEC) in DMF to obtain the molecular weight and polydispersity index (PDI). The composition of the block copolymer was determined by titration in acetic acid/HClO₄ using crystal violet indicator. Copolymer PDI is determined by SEC.

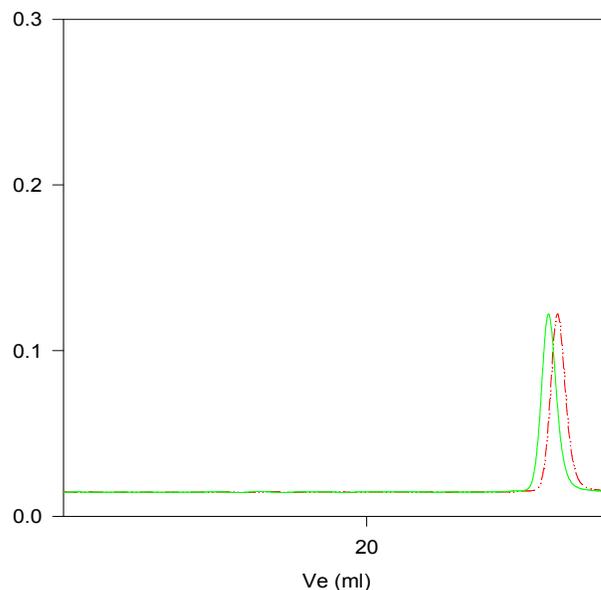
Quaternization. Polymer was dissolved in distilled DMF. Distilled methyl iodide was added 2 molar excess. The quaternized polymer was precipitated into hexane, filtered and washed with hexane several times. It was dried under vacuum for 8 h., the yield of the polymer indicating quantitative quaternization. The quaternization is confirmed by the disappearance of the pyridine band at 1416cm⁻¹ as measured by FTIR.

NMR of the precursor



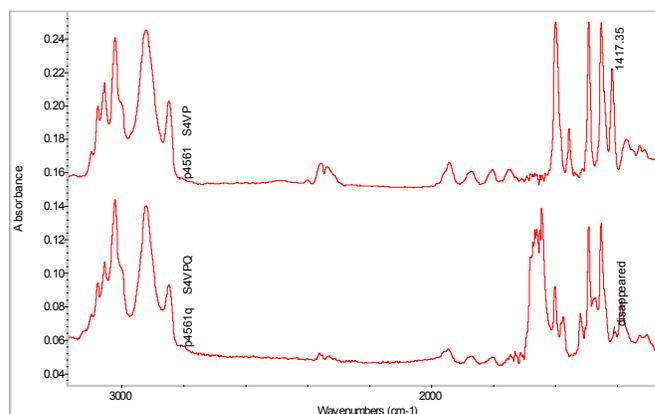
SEC of Sample Lot #P4561

P4561-S4VP(precursor for P4561-S4VPQ)



- SEC profile in DMF at 30 °C.
Polystyrene, M_n=25000, M_w:26500 PI=1.05
- Block Copolymer PS(25000)-*b*-P4VP(7000), PI=1.09 (composition by titration and by H NMR) after quaternization Mn 25000-*b*-16000 PI 1.1

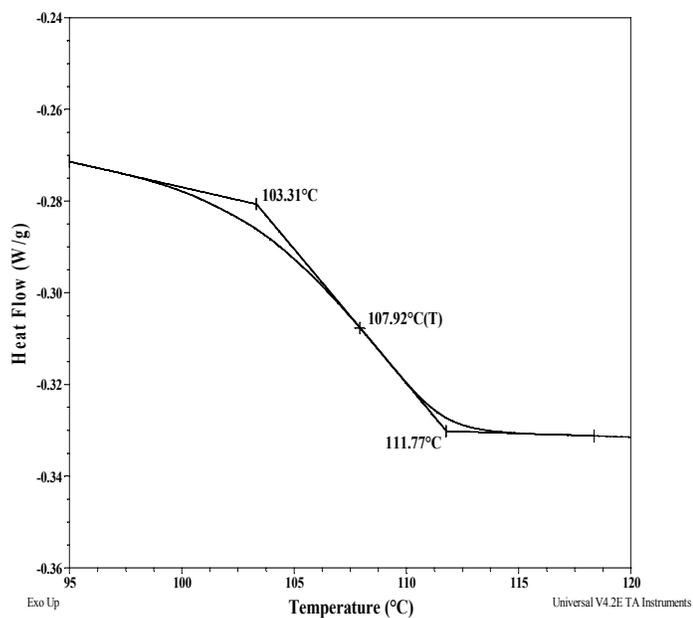
FTIR of product and precursor



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).

DSC thermogram for PS block:



References:

- (1). S. K. Varshney, X. F. Zhong and A. Eisenberg, *Macromolecules*, **1993**, 26, 701-706.
- (2). Z.Gao, S. K. Varshney, S. Wong, A. Eisenberg, *Macromolecules*, **1994**, 27, 7923-7927.