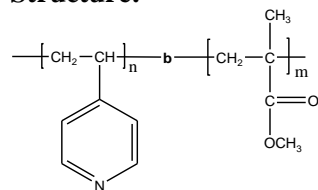


Sample Name: Poly(4-vinyl pyridine-b-methyl methacrylate)

Sample #: P40607-4VPMMA

Structure:

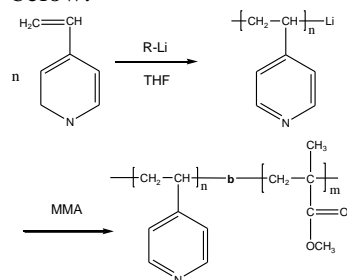


Composition:

$M_n \times 10^3$ 4VP-b-MMA	Mw/Mn (PDI)
32.0-b-156.0	1.04
T_g for 4VP block: Not distinct	T_g for MMA block: 118 °C

Synthesis Procedure:

Poly(4-vinyl pyridine-b-methyl methacrylate) is synthesized by living anionic polymerization with sequence addition of 4-vinyl pyridine followed by methyl methacrylate. The reaction scheme is shown below:



Characterization:

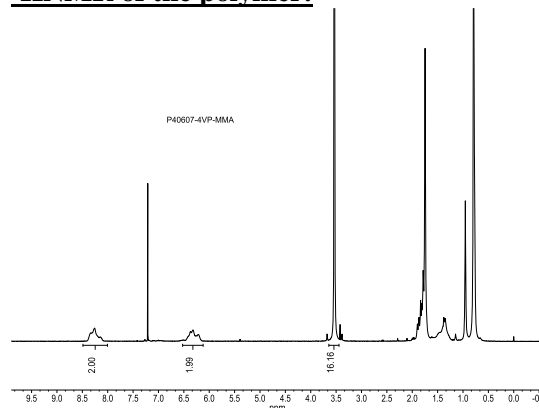
An aliquot of the anionic 4-vinyl pyridine block was terminated before addition of methyl methacrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The block copolymer composition was then calculated from $^1\text{H-NMR}$ spectroscopy by comparing the peak area of the 4-vinyl pyridine proton peaks at about 8.5 ppm with the methyl methacrylate protons at 3.6 ppm. Copolymer PDI is determined by SEC.

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).

Solubility:

Polymer is soluble in THF, CHCl_3 and dioxane.

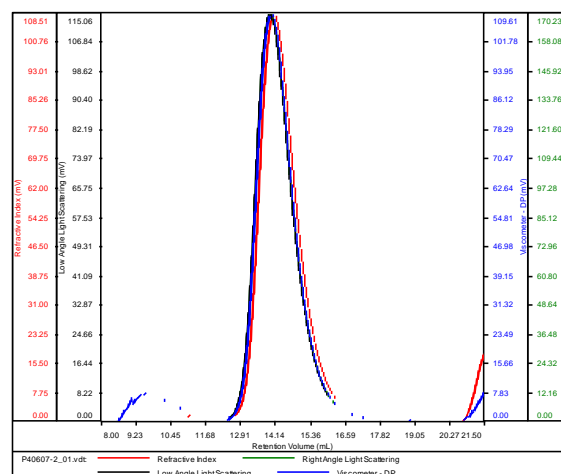
$^1\text{H-NMR}$ of the polymer:



SEC of Sample of the block copolymer:

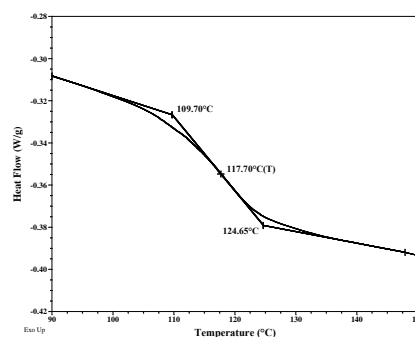
P40607-2

Conc	7.8710
dn/dc	0.1580
Solvent	DMF w 0.023M LiBr
Flow Rate	0.7000
Method	PS80k-May2017-0000.vcm



Sample	M_n	M_w	M_p	Mw/Mn	IV
P40607-2_01.vdt	188,050	195,344	193,009	1.039	0.2369

DSC thermogram for MMA block:



Reference:

S. K. Varshney, X. F. Zhong and A. Eisenberg
"Anionic Homopolymerization and Block Copolymerization of 4-Vinylpyridine and Its Investigation by High-Temperature Size-Exclusion Chromatography in N-Methyl-2-Pyrrolidinone" CA Vol 118, 12, 102658 Macromolecules, 1993, 26, 701-706.