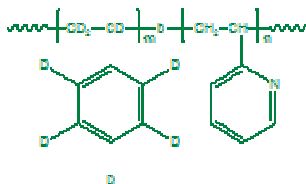


Sample Name:

Deuterated Polystyrene (d₈)-b- 2 vinyl
pyridine (protonated)

Sample #: P19300-PdS2VP

Structure:



Composition:

Mn x 10 ³ (dPS-b-2VP)	PDI
48.0-b-50.0	1.11
T _g for dPS block	103°C
T _g for 2VP block	Not observed

Synthesis Procedure:

Deuterated poly(styrene-b-2-vinyl pyridine) diblock copolymer is prepared by living anionic polymerization.

Characterization:

The molecular weight and polydispersity index (PDI) of the block copolymer are characterized by size exclusion chromatography (SEC). The composition of the block copolymer was calculated from ¹H-NMR by comparing the peak area of the phenyl polystyrene protons between 6.4 to 7.2 ppm (indicating about 1% protonated fraction) and the ethylene oxide protons at 3.65 ppm. This is given an approximate analysis. The yield of the polymer from the theoretical amount of deuterated styrene and protonated vinyl pyridine monomer calculate also the compositions required.

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).

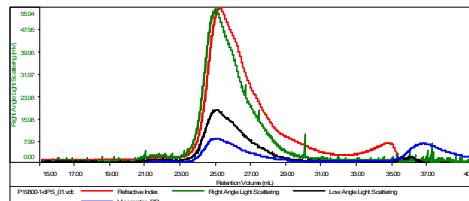
Solubility:

The polymer is soluble in THF (at 35°C), CHCl₃, benzene, toluene, dioxane.

SEC of the product:

Sample ID: P19300-1-dPS

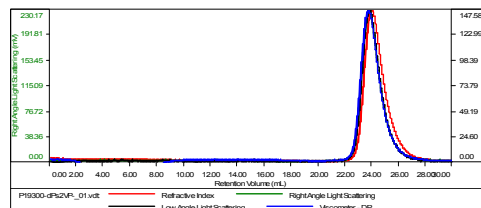
Concentration (mg/mL)	3.0192
Sample chidc (mL/g)	0.1700
Method File	PS80K-May20-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersity	Intrinsic Viscosity (dL/g)
P19300-1-dPS_01.vdt	48,396	54,749	59,606	1.131	0.4015

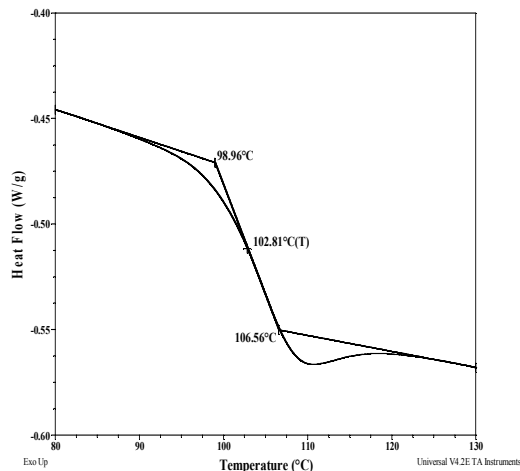
Sample ID: P19300-dPS2VP

Concentration (mg/mL)	4.3133
Sample chidc (mL/g)	0.1700
Method File	PS80K-May20-2015-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	MW Number Average (Da)	MW Weight Average (Da)	MW at Peak (Da)	Polydispersity	Intrinsic Viscosity (dL/g)
P19300-dPS2VP_01.vdt	97,770	108,931	110,562	1.114	0.6323

DSC thermogram for dPS block:



References for further information:

1. S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
2. S. K. Varshney, Jian-Xin Zhang. US patent 7009,033 B3 2006.