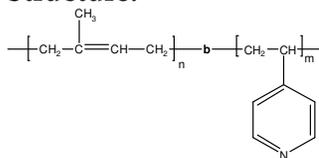


Sample Name: Poly(1,4-isoprene-b-4-vinyl pyridine)

Sample #: P5768-Ip4VP

Structure:

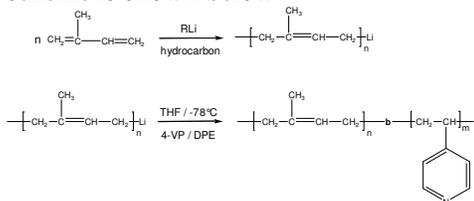


Composition:

| | |
|------------------------------------|-------------------------------------|
| Mn x 10 ⁵ Ip-b-4VP | Mw/Mn (PDI) |
| 29.0-b-35.5 | 1.10 |
| T _g for Ip block: -62°C | T _g for 4VP block: 118°C |

Synthesis Procedure:

Poly(1,4-isoprene-b-4-vinyl pyridine) is prepared by living anionic polymerization with sequence addition of isoprene followed by 4-vinyl pyridine. The reaction scheme is shown below:



Characterization: An aliquot of the anionic poly(1,4-isoprene) 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 final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the vinylic isoprene proton at about 5.1 ppm with 4-vinyl pyridine protons at 8.5 ppm. Block copolymer PDI is determined by SEC.

Purification of Polymer: The traces amount of homopolyisoprene was separated from the diblock copolymer by dissolving the polymer in THF and fractionated by acetone (fractional precipitation). The polymer ageing stirrer in toluene at room temperature and kept the suspension in cold for over night. It was than decanted and precipitated in acetone. The absence of polyisoprene fraction than validated by SEC in THF.

SEC analysis is carried out in THF and indicate the formation of micelization with Mn around over 16 million. SEC analysis ensure the separation of any traces amount of homopolyisoprene fraction from the diblock copolymer.

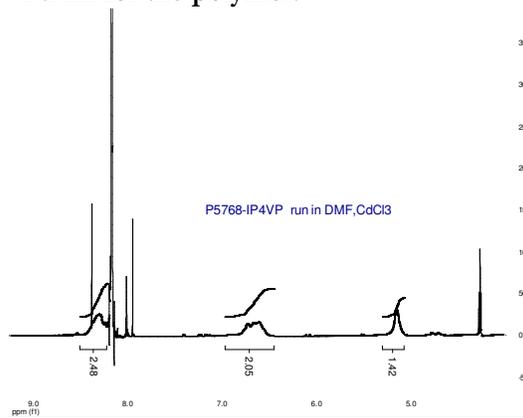
Thermal Analysis:

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 15°C/min. The inflection glass transition temperature (T_g) of the sample has been considered.

Solubility:

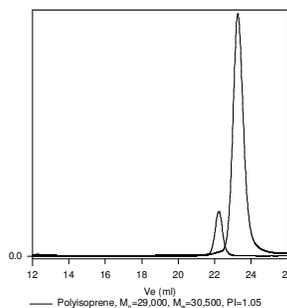
Poly(1,4-isoprene-b-4-vinyl pyridine) is soluble in THF, chloroform.

¹H-NMR for the polymer:



SEC profile of the block copolymer

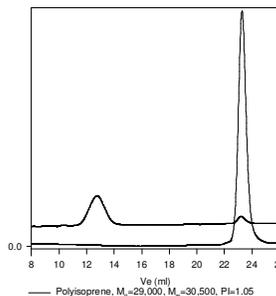
P5768-IP4VP



— Polyisoprene, M_n=29,000, M_w=30,500, PI=1.05
— Block Copolymer PIP(29,000)-b-P4VP(35,500), PI=1.06
P4VP block length from FTIR-absorbance at 1599 cm⁻¹ and from ¹H-NMR.

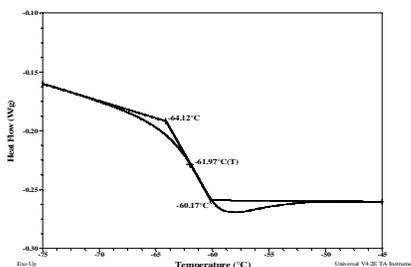
SEC PROFILE OF THE POLYMER IN THF

P5768-IP4VP



— Polyisoprene, M_n=29,000, M_w=30,500, PI=1.05
— Block Copolymer PIP(29,000)-b-P4VP(35,500), PI=1.06
P4VP block length from FTIR-absorbance at 1599 cm⁻¹ and from ¹H-NMR
Mn of the Micellar architecture: over 20 Millions

DSC thermogram for Ip block:



Thermogram for 4VP block:

