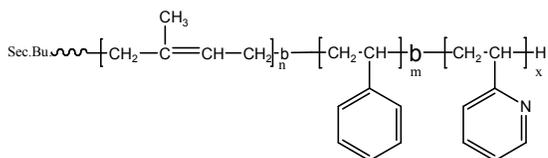


Sample Name:

Poly(Isoprene-b-styrene-b-2vinyl pyridine)

Sample #: P8244-IPS2VP

Structure:



Composition:

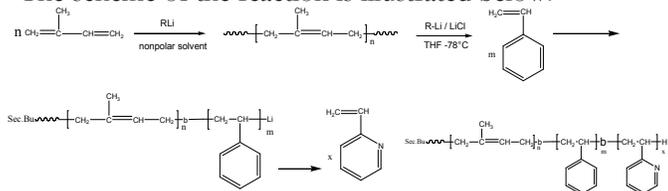
Mn x 10 ³ IP-b-S-2VP	PDI
18.0-b-450.0-35.0	1.6

Thermal analysis results at a glance

For PS block:	For 2VP block:	For PIP block:
T _g : 103°C	T _g : Not distinct	T _g : -68°C

Synthesis Procedure:

By living anionic polymerization with sequence addition of isoprene (polymerization in apolar solvent) than styrene, followed by addition of 2 vinyl pyridine (2VP). The scheme of the reaction is illustrated below:



Characterization:

First Block: Size exclusion chromatography (SEC): Varian liquid chromatograph equipped with UV and refractive detector. SEC columns from Supelco were used with THF as the eluent. The columns were calibrated with monodisperse polystyrene. The molecular weights and the polydispersity index were calculated.

Second and Third Block: The chemical composition was extracted from proton NMR, which was recorded from Varian 500MHz instrument using CDCl₃ as solvent. The molecular weights of second and third block were calculated based on the molecular weight of other blocks and the chemical composition. The polydispersity index of block copolymer was obtained by SEC as described above.

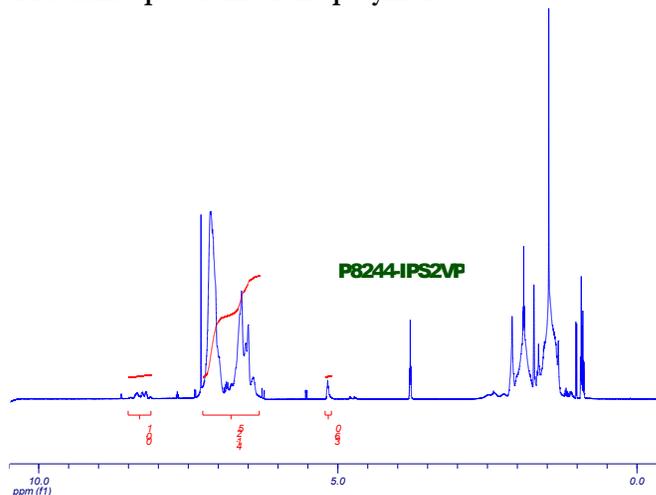
Thermal Analysis

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).

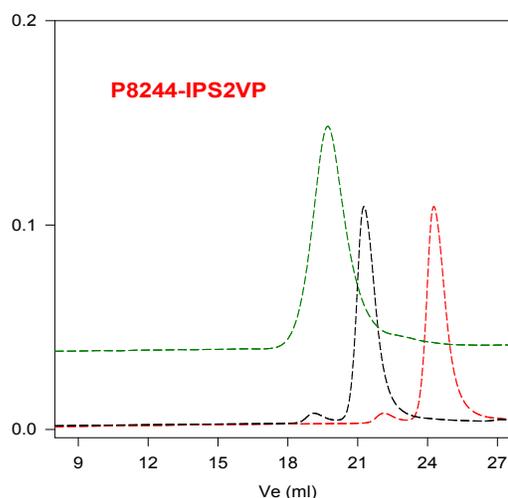
Solubility:

Polymer is soluble in THF, toluene, and CHCl₃. The polymer readily precipitates from cold hexanes/ethanol mixture.

¹H-NMR Spectrum of the polymer:



SEC for the polymer:



Size exclusion chromatography of poly(IP-b-S-b-2VP)

--- PIP (rich in 1, 4 addition), M_n=18000, M_w=18500, M_w/M_n=1.04

--- Poly(IP-b-S): P(18000)-b-S(450000) M_w/M_n=1.08

--- Triblock copolymer: P(IP)18000-b-S(450000)-b-2VP(35000) M_w/M_n=1.6

Composition from ¹H NMR

dn/dc in THF at 35 oC: 0.136ml/g Solution Viscosity in THF at 35 oC: 1.66dl/g

DSC thermogram for PS block:

