

Product Profile

Identification

Product Name: Poly(styrene-b-4-vinyl-pyridine)

Product Lot Number: P18248-R-S4VP

CAS #: 26222-40-2

Product Chemical Architecture:



Composition:

Composition (S-b-4VP)	53,000-b-23,000
4VP mole%	30.4
Mn (g/mole)	76,000
Mw (g/mole)	78,000
Mw/Mn	1.02
dn/dc (mL/g) in DMF at 35 °C	0.161

Method of Synthesis

The polymer is synthesized by anionic polymerization process.

Solubility in different solvents:

THF	Depends on composition	DMF	✓
Alcohol	Depends on composition	CHCl ₃	✓
Toluene _(hot)	X	Water	X

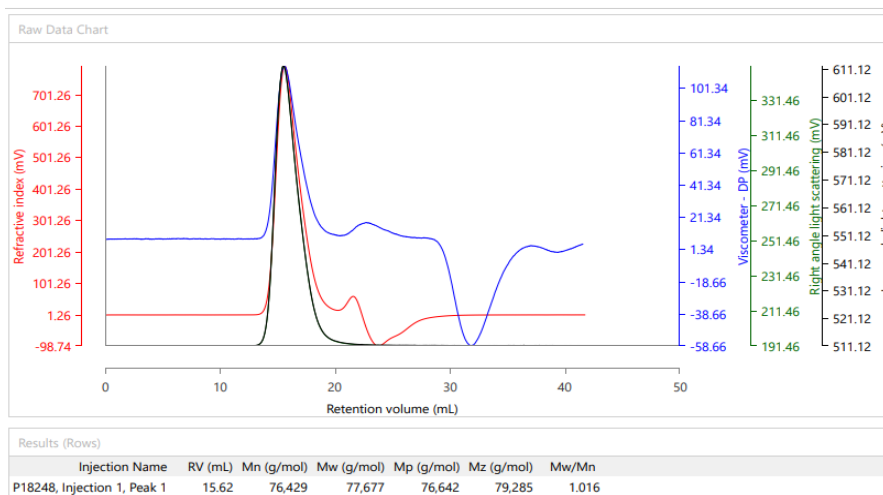
Validation of Architecture

A. Gel Permeation Chromatography (GPC), SEC Profile:

Molecular weights were determined by Malvern OmniSec Reveal & Resolve GPC/SEC System equipped with Triple detector (RI, Viscometer, RALS 90° and LALS 7°) and two columns (PSS, SDV, 8x300 mm). DMF with 0.023M LiBr was the eluent. The flow rate was 0.7 ml/min.

Polymer Source

Malvern Panalytical



Chemical structure of P18248-S4VP is shown above the spectrum. The structure is a copolymer consisting of two main repeating units: a polyisobutylene (PIB) unit and a poly(4-vinylpyridine) (P4VP) unit. The PIB unit is represented as $\text{H}_3\text{C}-\text{CH}_2-\text{CH}(\text{H}_3\text{C})-\text{CH}_2-$ and the P4VP unit is represented as $-\text{CH}_2-\text{CH}(\text{C}_5\text{H}_4\text{N})-$, where $\text{C}_5\text{H}_4\text{N}$ is a 4-vinylpyridine ring. The structure is shown with stereochemistry (wedges and dashes) and a subscript n for the PIB unit and m for the P4VP unit.

The ^1H NMR spectrum shows the following peaks and integrations:

- Peak at ~8.2 ppm (integration 2.00): Aromatic protons of the 4-vinylpyridine ring.
- Peak at ~6.8-7.2 ppm (integration 13.43): Aromatic protons of the 4-vinylpyridine ring.
- Peak at ~1.5-2.5 ppm: Aliphatic protons of the polyisobutylene unit.