

Product Profile

Identification

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

Product Lot Number: P4912-R-S4VP

CAS #: 26222-40-2

Product Chemical Architecture:



Composition:

Composition (S-b-4VP)	245,000-b-8,000
4VP mole%	3.2
Mn (g/mole)	253,000
Mw (g/mole)	265,000
Mw/Mn	1.04
dn/dc (mL/g) in DMF at 35 °C	0.165

Method of Synthesis

The polymer is synthesized by anionic polymerization process.

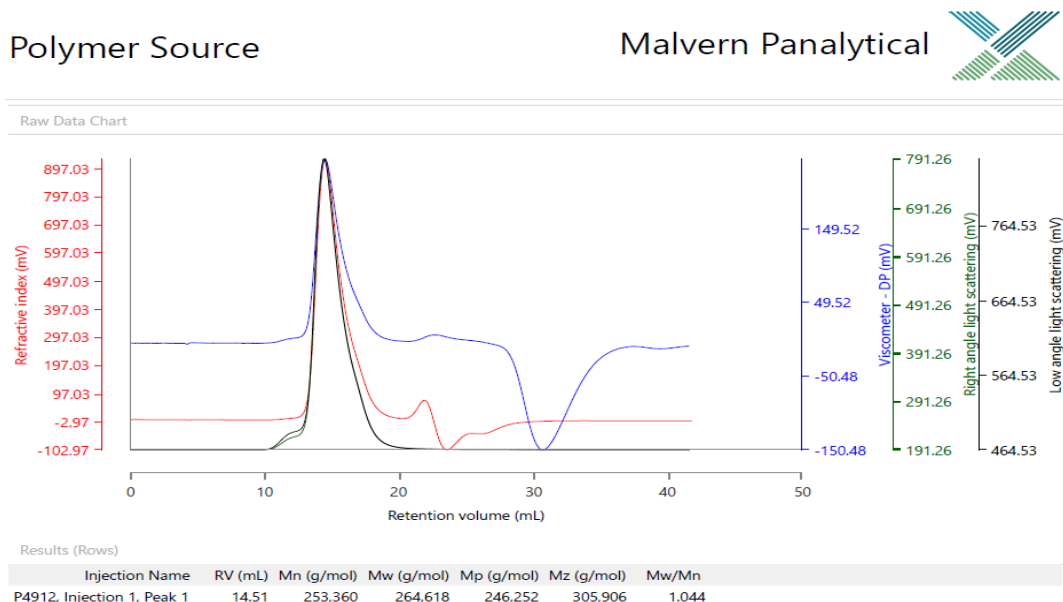
Solubility in different solvents:

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.



The figure displays the ^1H NMR spectrum of the copolymer P4912-S4VP. The x-axis represents the chemical shift in ppm (f1), ranging from 10.0 to 0.0. The y-axis represents the intensity, ranging from -10 to 70. The spectrum shows several distinct peaks: a small peak at approximately 8.5 ppm (integration 1.00), a large peak at approximately 7.2 ppm (integration 77.42), a smaller peak at approximately 6.5 ppm, and a complex set of peaks between 2.5 and 4.0 ppm. A chemical structure of the copolymer is shown above the spectrum, with various protons labeled with letters (a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z) and numbers (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100). The structure includes a poly(ethylene glycol) chain, a poly(vinyl alcohol) chain, a poly(4-vinylpyridine) chain, and a poly(4-vinylbenzyl) chain. The peaks in the spectrum are assigned to these protons: the peak at 8.5 ppm is assigned to the pyridine ring protons (labeled 'a' in the structure), the peak at 7.2 ppm is assigned to the aromatic protons of the vinylbenzyl units (labeled 'b' in the structure), the peak at 6.5 ppm is assigned to the pyridine ring protons (labeled 'c' in the structure), and the peaks between 2.5 and 4.0 ppm are assigned to the aliphatic protons of the poly(ethylene glycol) and poly(vinyl alcohol) chains (labeled 'd' through 'z' in the structure).