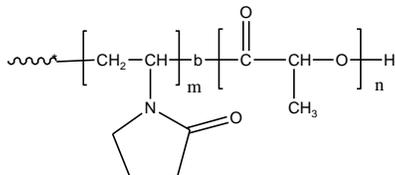


Sample Name:

Poly(N-vinylpyrrolidone-b-lactide) (L form)

Sample #: P7153-NVPLA (L form)

Structure:

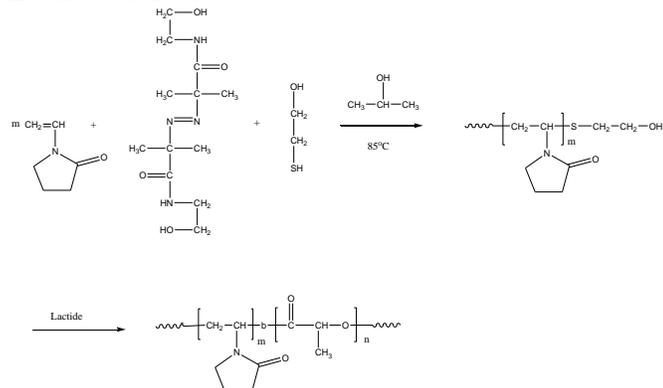


Composition:

Mn × 10 ³ PVP-b-PLA (L form)	PDI
9.0-b-11.0	1.4

Synthesis Procedure:

Poly(N-vinylpyrrolidone -b- lactide) is prepared by radical polymerization of N-vinylpyrrolidinone at the presence of chain transfer agent, followed by anionic polymerization of lactide with the catalyst. The scheme of the reaction is illustrated below:



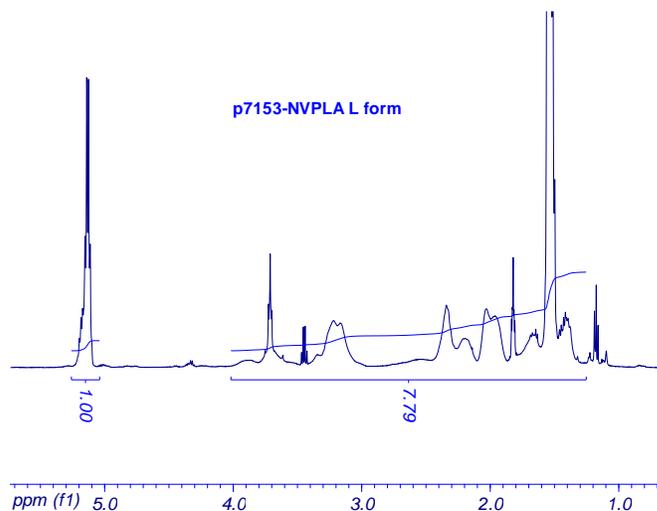
Characterization:

An aliquot of the hydroxyl ended poly(N-vinylpyrrolidone) block was terminated before addition of lactide 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 methane of lactide at about 5.1 ppm with the poly(N-vinylpyrrolidone) protons at about 1.0-4.5 ppm deduced the methyl contribution of lactide.

Solubility:

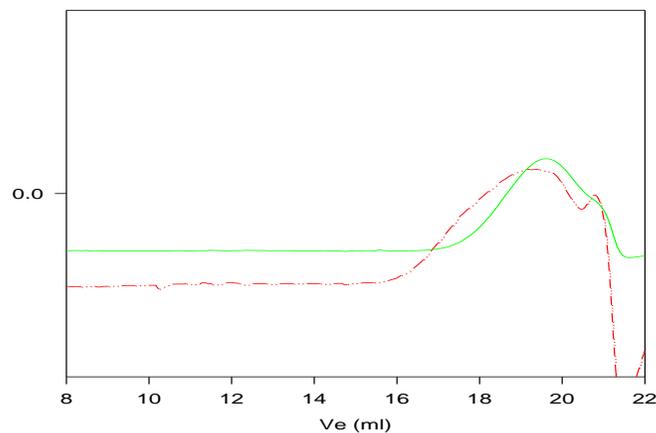
Poly(N-vinylpyrrolidone -b- lactide) is soluble in chloroform, THF, DMF, toluene and precipitates from ethanol, ether and hexane.

¹H-NMR Spectrum of the block copolymer:



SEC of the block copolymer:

P7153-NVPLA(L form)



Size exclusion chromatography(DMF eluent):

- Poly(N-vinylpyrrolidone), Mn=9000, Mw=11700, PI=1.3
 - - - Block copolymer PNVP(9000)-b-PLA(11000) PI 1.4
- Composition from NMR
Dp: NVP (81units)-b-LA (152units)

Thermal analysis of # P7153-NVPLA sample

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).

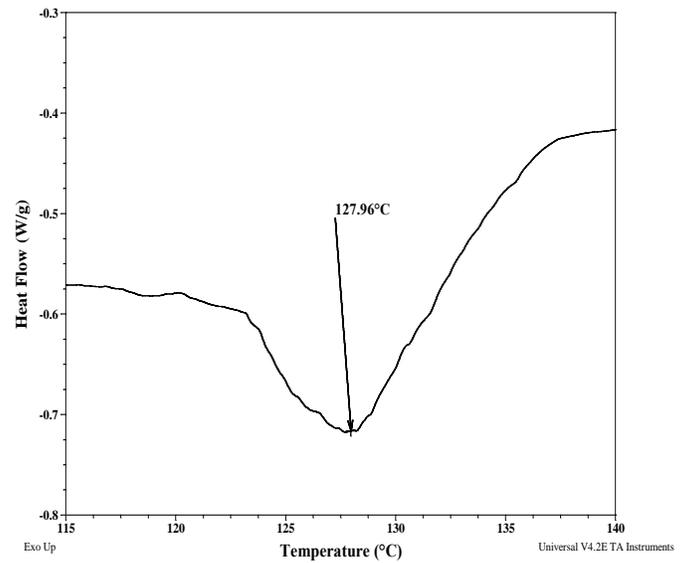
Melting and crystallization curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

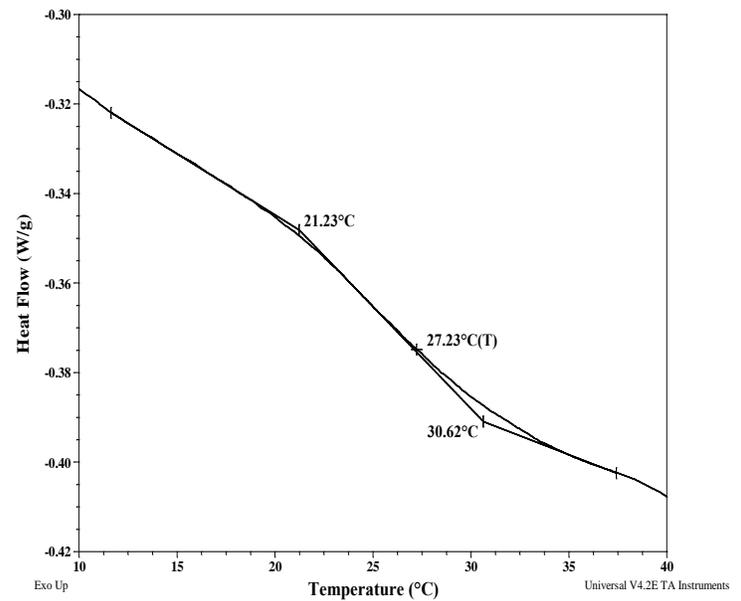
Thermal analysis results at a glance

Sample	T_m (°C)	T_c (°C)	T_g (°C)
PLA	128	-	53
PNVP	-	-	27

Melting curve for DMS block:



Thermogram for NVP block:



Thermogram for PLA block:

