

Polyvinylpyrrolidone (PVP)

CAS # 9003-39-8

EXIM-INDIS INC
EVOLVING CHEMISTRY

Product In Focus

Polyvinylpyrrolidone (PVP)

INTRODUCTION

Polyvinylpyrrolidone (PVP) is a water-soluble synthetic polymer obtained from the polymerization of N-vinyl-2-pyrrolidone. It is widely used across pharmaceutical, biomedical, and industrial applications due to its excellent biocompatibility, low toxicity, strong film-forming ability, and exceptional solubilizing and stabilizing properties. PVP is chemically stable, relatively inert, and resistant to thermal degradation, making it a versatile functional polymer.

- ✓ Synthetic, non-ionic, water-soluble polymer
- ✓ Linear polymer composed of N-vinyl-2-pyrrolidone units
- ✓ Available in a wide range of molecular weights (commonly expressed as K-values, e.g., K-30, K-90)
- ✓ Typically supplied as white to off-white hygroscopic powder.

KEY DETAILS

CAS No	9003-39-8
Formula	$(C_6H_9NO)_n$
Synonyms	PVP, Povidone, Polyvidone, Poly[1-(2-oxo-1-pyrrolidinyl) ethylene]
Common Grades (K-values):	K-15, K-30, K-90
MDL Number	MFCD00149016
Structure	



PVP

MANUFACTURE

It is typically manufactured by free-radical polymerization of N-vinyl-2-pyrrolidone monomer. Industrial production may also utilize the Reppe synthesis route to prepare the monomer, followed by controlled polymerization to achieve desired molecular weight and performance characteristics.

APPLICATION

Advanced Materials / Nanotechnology

- ✓ Carrying polymer for electrospinning of continuous titania nanofibers and zirconium tungstate ultra-thin fibers
- ✓ Structure-directing agent in fabrication of metal oxide nanofibers and porous materials
- ✓ Acts as a reducing agent and colloidal stabilizer in synthesis of palladium nanobars, triangular nanoplates, and related nanostructures
- ✓ Serves as a capping agent to control nanoparticle size, morphology, and dispersion stability

Pharmaceutical

- ✓ Tablet binder and granulation aid
- ✓ Solubilizing agent for poorly water-soluble drugs (solid dispersions)
- ✓ Stabilizer in suspensions and emulsions
- ✓ Film-forming agent in coatings

Food & Beverage

- ✓ Clarifying agent in beverages such as beer and wine
- ✓ Stabilizer for flavors, colors, and active ingredients
- ✓ Used as a processing aid in food formulations

Cosmetic / Personal-care

- ✓ Film-forming agent in hair sprays, gels, and styling products
- ✓ Binder and stabilizer in creams and lotions
- ✓ Enhances texture, spreadability, and formulation stability



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APPLICATION (Continued)

Toiletry & Hygiene

- Used in toothpaste and oral care formulations as a binder and stabilizer
- Provides viscosity control and formulation consistency

Photographic / Imaging

- Protective colloid and binder in photographic emulsions
- Used in coating formulations for imaging films and specialty papers

It is widely used because it

- has excellent solubility in water and many organic solvents
 - provides strong steric stabilization for nanoparticles and colloids
 - forms clear, flexible, and adhesive films
 - is biocompatible, non-toxic, and chemically stable
- functions as both a performance enhancer and processing aid

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SPECIFICATIONS

Test	Unit	Specification
Description	-	White to off-white hygroscopic powder
Identification	a) By IR Absorption/NMR Spectrum	The infrared absorption/NMR spectrum of the test sample should be concordant with the reference spectrum of PVP
	b) By solubility	Freely soluble in water and alcohol
K-Value (Molecular Weight Indicator)	-	As specified (e.g., K-30, K-90)
pH (5% solution)	-	3.0 – 7.0
Moisture Content	%	NMT 5.0
Residue on Ignition (Ash)	%	NMT 0.1
Residual Monomer (N-vinylpyrrolidone)	ppm	NMT 10
Heavy Metals	ppm	Complies with pharmacopeial limits

STORAGE & PRECAUTION

Store in tightly sealed containers in a cool, dry, well-ventilated area. Protect from moisture due to hygroscopic nature.

PACKING

HDPE bags / fiber drums with inner polyethylene liner

GMP STATUS

Manufactured under cGMP or non GMP conditions based on customer specifications and intended application.

COMMERCIAL NOTE

PVP is available in multiple grades with tailored molecular weight (K-values) to meet specific requirements across pharmaceutical, cosmetic, food, and industrial applications.

Exim-Indis offers Polyvinylpyrrolidone (PVP) on commercial scales and welcomes enquiries. No matter the quantity you need, our exceptional quality and service will make Exim-Indis your supplier of choice. If you need any additional information or SDS, please contact us.