H-1611 N-Vinylpyrrolidone/N-Vinylimidazole Copolymer (VP/VI)

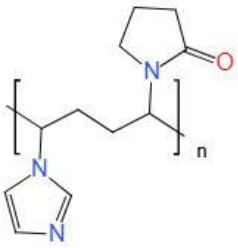
Product Overview

H-1611 is a 30% solid-content aqueous solution of an N-vinylpyrrolidone/N-vinylimidazole copolymer. It is a weakly cationic water-soluble polymer that combines the excellent film-forming and dispersing properties of PVP with the cationic dye-binding capability of vinylimidazole.

It can efficiently complex free dyes and prevent dye redeposition onto fabrics. The product performs well in high-salt, high-hardness, and low-temperature washing conditions, and is widely used in textile dyeing & printing, detergent formulations, and agrochemical applications.

Appearance: light yellow to yellow liquid. Not classified as a hazardous chemical, with good storage stability and compatibility.

- **CAS No.:** 29297-55-0
- **Molecular Formula:** $[C_5H_6N_2]m[C_6H_9NO]n$
- **Structural Formula:**



Solubility

Soluble in water, methanol, ethanol, DMF, and DMSO; insoluble in non-polar solvents.

Stability

Stable at room temperature in sealed conditions. Avoid strong acids, strong oxidizing agents, and high-temperature environments. Not prone to decomposition under normal storage conditions.

Product Features

1. **Dual anti-redeposition mechanism:**
   Cationic groups electrostatically capture free dyes, while pyrrolidone segments encapsulate pigments, significantly improving wet and wash color fastness.
2. **Low-temperature & energy-saving performance:**
   Stable in high-electrolyte and hard-water conditions, enabling lower washing temperatures, reduced washing steps, and improved water and energy efficiency.
3. **Multi-functional use:**
   Acts as a standard anti-staining agent in detergent systems; at higher dosages, can function as a stripping or color correction auxiliary for reactive dyes.
4. **Excellent compatibility:**
   Fully soluble in water, alcohols, DMF, and DMSO; compatible with surfactants and dyeing auxiliaries without phase separation or precipitation.
5. **Additional functional benefits:**
   Provides mild film-forming and antistatic properties; also contributes to softening and color protection in care systems.
6. **Safe & easy handling:**
   Stable at room temperature. Slight skin irritation potential. Free of APEO and fluorescent agents; environmentally friendly and biodegradable.

Physical Properties

Item	Specification	Test Method
Appearance	Light yellow to yellow liquid	Visual
Solid Content	29–31%	Gravimetric
Viscosity (25°C)	200–400 mPa·s	Rotational viscometer
pH (25°C)	8.0–10.0	pH meter
Color (Gardner)	≤ 6.0	Colorimeter

Applications

1. Textile Dyeing & Printing

- Anti-backstaining agent in reactive dye washing
- Anti-staining for printing white ground areas
- Denim garment washing color protection
- Wash efficiency enhancer for blended fabrics
- Stripping and color correction of slightly stained fabrics

2. Detergent Industry

- Color protection and anti-staining agent in laundry detergents and capsules
- Raw material for color-capture laundry sheets
- Industrial laundry for hotel linens
- Specialized detergent for silk and wool

3. Personal Care

- Post-dye color locking and hair care formulations
- Hair styling and conditioning agent
- Reduces hair dye fading and improves antistatic properties

4. Agrochemical Additives

- Dispersant/stabilizer for suspension concentrates (SC)
- Stabilizer for water-soluble fertilizers
- Prevents sedimentation and aggregation of colored agrochemicals

5. Other Applications

- Pigment dispersant in water-based colorants
- Color uniformity agent in paper manufacturing
- Wastewater decolorization auxiliary agent in dyeing effluents

Safety Information

GHS Hazard Statement

- **H315:** Causes skin irritation (Category 2)

Handling Precautions

1. Wash hands and exposed skin thoroughly after handling.
2. Wear protective gloves, protective clothing, eye protection, face protection, and hearing protection where necessary.

First Aid Measures

1. Skin (or hair) contact: Wash thoroughly with soap and water.
2. If skin irritation occurs: Seek medical advice.
3. Remove contaminated clothing and wash before reuse.

Packaging & Storage

Packaging

- Samples: 50 g, 100 g, 500 g, 1 kg fluorinated bottles
- Commercial: 5 kg, 25 kg, 200 kg plastic drums; 1000 kg IBC containers

Storage Conditions

1. Store in a cool, dry, well-ventilated, and light-protected warehouse. Keep sealed and away from heat and ignition sources.
2. Storage temperature: 5–35°C
3. Shelf life: 12 months from production date under proper storage conditions
4. After opening, use as soon as possible. Reseal tightly after use to prevent contamination.