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Polyvinyl Acetate Dispersion

DEFINITION

Dispersion of polyvinyl acetate in water. It contains 25.0% to 30.0% of polyvinyl acetate. It may contain povidone and sodium lauryl sulfate as stabilizers.

IDENTIFICATION

• **A. FILM FORMATION:** Place 1 drop of Dispersion on a glass plate and allow to dry. A clear and homogeneous film is formed.

• **B. INFRARED ABSORPTION**

(See [Spectroscopic Identification Tests \(197\)](#), [Infrared Spectroscopy](#).)

Analysis: Place 1 drop of the Dispersion on a glass plate, and cover the test substance with a water-resistant crystal disk (silver chloride or KRS-5).¹ Gently press on, and then remove the crystal disk. Dry the crystal disk in a drying chamber until a homogeneous film is formed.

Acceptance criteria: The IR absorption spectrum of the film so formed exhibits maxima corresponding to the same wavelengths as those of a similar preparation of [USP Polyvinyl Acetate Dispersion RS](#) treated in the same manner.

ASSAY

Change to read:

PROCEDURE

Sample 1: 10 g of Dispersion

Solvent: 50 mL of a mixture of equal volumes of [alcohol](#) and [petroleum ether](#) with a 100°–120° boiling range, which is previously neutralized with 0.1 N potassium hydroxide or 0.1 N sodium hydroxide

Analysis 1: Dissolve *Sample 1* in the *Solvent*. Add 0.5 mL of [phenolphthalein TS](#), and titrate with 0.1 N potassium hydroxide or 0.1 N sodium hydroxide until the pink color persists for at least 15 s.

Calculate the acid value, I_A :

$$\text{Result} = (M_{r1} \times V \times N) / W$$

M_{r1} = molecular weight of potassium hydroxide, 56.11

V = volume of 0.1 N potassium hydroxide or 0.1 N sodium hydroxide consumed in the actual test (mL)

N = exact normality of the potassium hydroxide solution or sodium hydroxide solution

W = weight of Dispersion taken for the test (g)

Sample 2: 1.5 g of Dispersion

Analysis 2: Transfer *Sample 2* to a 250-mL borosilicate glass flask fitted with a reflux condenser. Add 25.0 mL of [0.5 M alcoholic potassium hydroxide](#) and a few glass beads. Attach the condenser and heat under reflux for 30 min. Add 1 mL of [phenolphthalein TS](#), and titrate immediately (while still hot) with 0.5 N hydrochloric acid VS. Perform a blank determination under the same conditions (see [Titrimetry \(541\)](#)▲ (CN 1-Aug-2024) -)

Calculate the saponification value, I_S :

$$\text{Result} = [M_{r1} \times (V_B - V_T) \times N] / W$$

M_{r1} = molecular weight of potassium hydroxide, 56.11

V_B = volume of 0.5 N hydrochloric acid consumed in the blank test (mL)

V_T = volume of 0.5 N hydrochloric acid consumed in the actual test (mL)

N = exact normality of the hydrochloric acid

W = weight of Dispersion taken for the test (g)

Calculate the percentage content of polyvinyl acetate in the portion of Dispersion taken:

$$\text{Result} = F \times \{M_{r2} \times [(I_S - I_A)/M_{r1}]\} \times 100$$

F = factor converting mg to g, 10^{-3} g/mg

M_{r2} = molecular weight of vinyl acetate, 86.09

I_S = saponification value

I_A = acid value

M_{r1} = molecular weight of potassium hydroxide, 56.11

Acceptance criteria: The content of polyvinyl acetate is 25.0%–30.0%.

OTHER COMPONENTS

Stabilizers

• Povidone

[NOTE—Perform this test only if the Dispersion contains povidone.]

Sample: 0.25 g

Analysis: Perform nitrogen determination by sulfuric acid digestion on the *Sample* as directed in [Nitrogen Determination \(461\), Method II](#).

Calculate the percentage content of povidone in the portion of Dispersion taken:

$$\text{Result} = N/N_V$$

N = percentage content of nitrogen

N_V = percentage content, expressed as a decimal number, of nitrogen in vinylpyrrolidone, 0.126

Acceptance criteria: The content of povidone is NMT 4.0%.

IMPURITIES

• RESIDUE ON IGNITION (281)

Sample: 1.0 g of Dispersion

Analysis: Heat a silica crucible to redness for 30 min, allow to cool in a desiccator, and weigh. Evenly distribute the *Sample* in the crucible and weigh. Dry the crucible at 100° – 105° for 1 h and ignite in a muffle furnace at $600 \pm 25^\circ$, until the test substance is thoroughly charred.

Continue the experiment as directed in [Residue on Ignition \(281\)](#), on the residue obtained, beginning with “Moisten the sample with a small amount (usually 1 mL) of sulfuric acid...”

Acceptance criteria: NMT 0.5%

• LIMIT OF VINYL ACETATE

Solution A: Acetonitrile, methanol, and water (5:5:90)

Solution B: Acetonitrile, methanol, and water (45:5:50)

Mobile phase: See [Table 1](#).

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	100	0
2	100	0
40	85	15

