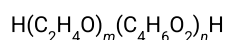
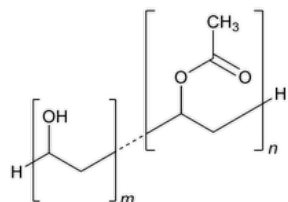


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Polyvinyl Alcohol



Vinyl alcohol and vinyl acetate copolymer (87:13);

A saponified polyvinyl acetate;

Poly(ethanol)co(vinyl acetate).

CAS RN®: 9002-89-5.

DEFINITION

Polyvinyl Alcohol is a water-soluble synthetic resin, represented by the formula $(\text{C}_2\text{H}_4\text{O})_m(\text{C}_4\text{H}_6\text{O}_2)_n$, in which the average value of $m+n$ lies between 444 and 4440. It is prepared by 85%–89% hydrolysis of polyvinyl acetate. The apparent viscosity, in $\text{mPa} \cdot \text{s}$, at 20° , of a 4% (w/w) aqueous solution is NLT 85.0% and NMT 115.0% of that stated on the label.

IDENTIFICATION

- **A. SPECTROSCOPIC IDENTIFICATION TESTS (197).** *Infrared Spectroscopy*: 197K
- **B.** It meets the requirements in the test for [Viscosity—Capillary Methods \(911\)](#), [Viscosity—Rotational Methods \(912\)](#), or [Viscosity—Rolling Ball Method \(913\)](#).
- **C.**

Sample solution: Dissolve 0.5 g of Polyvinyl Alcohol in 10 mL of water, with heat if necessary, and let the solution cool to room temperature.

Analysis 1: Transfer 5 mL of the *Sample solution* to a test tube, add 1 drop of iodine TS, mix, and allow to stand.

Acceptance criteria 1: A dark red to blue color is produced.

Analysis 2: Transfer 2 mL of the remaining *Sample solution* to a test tube, add 10 mL of Alcohol, and mix.

Acceptance criteria 2: A white, turbid, or flocculent precipitate is formed.

IMPURITIES

- **RESIDUE ON IGNITION (281):** NMT 1.0%
- **WATER-INSOLUBLE SUBSTANCES**

Analysis: Wash the tared 100-mesh screen used in the test for *Viscosity* immediately after with two 25-mL portions of water, and dry at 110° for 1 h.

Acceptance criteria: NMT 6.4 mg of water-insoluble substances are found (corresponding to NMT 0.1%).

Change to read:

- **LIMIT OF METHANOL (METHYL ALCOHOL) AND METHYL ACETATE**

Diluent: Water

Blank: Transfer 4.0 mL of *Diluent* to a 20-mL headspace vial and cap.

Standard stock solution: 20 mg/mL each of methanol (methyl alcohol) and methyl acetate prepared as follows. Prepare by transferring 1 g of [USP Methyl Alcohol RS](#) and 1 g of [USP Methyl Acetate RS](#) to a 50-mL volumetric flask containing *Diluent*. Dilute with *Diluent* to volume and mix.

Standard solution A: 0.20 mg/mL each of methanol (methyl alcohol) and methyl acetate prepared as follows. Transfer 2.5 mL of the *Standard stock solution* into a 250-mL volumetric flask containing *Diluent*. Dilute with *Diluent* to volume and mix. [NOTE—The stability of the *Standard solution* is 174 h, when stored at ambient room temperature conditions.]

Standard solution B: 0.01 mg/mL each of methanol (methyl alcohol) and methyl acetate prepared as follows. Transfer 5.0 mL of *Standard solution A* into a 100-mL volumetric flask containing *Diluent*. Dilute with *Diluent* to volume and mix.

Sample solution: 20 mg/mL of Polyvinyl Alcohol prepared as follows. Transfer 2 g of Polyvinyl Alcohol into a 100-mL volumetric flask. Pipet 100 mL of *Diluent* into the volumetric flask. Cap and cover with parafilm. Stir at 60° for 2 h. [NOTE—It is acceptable to have a few flakes of undissolved Polyvinyl Alcohol after extraction stirring.] Allow the sample to cool to room temperature. Pipet 4.0 mL of the solution into a 20-mL headspace vial and cap. [NOTE—The stability of the *Sample solution* is 167 h, when stored at ambient room temperature conditions.]

Chromatographic system

(See [Chromatography \(621\), System Suitability](#).)

Mode: GC, equipped with a headspace injector

Detector: Flame ionization

Column: 30-m × 0.32-mm; coated with a 1.8-μm phase [G43](#)

Temperatures

Injection port: 140°

Detector: 250°

Column: See [Table 1](#).

Table 1

Initial Temperature (°)	Temperature Ramp (°/min)	Final Temperature (°)	Hold Time at Final Temperature (min)
40	—	40	5
40	8	220	5

Carrier gas: Helium

Flow rate: 2 mL/min

Injection type: Split, split ratio 2.5: 1

Autosampler

Temperatures

Oven: 80°

Needle: 85°

Transfer line: 90°

Times

Injection: 0.04 min

Thermostating: 30.0 min

Needle withdrawal time: 0.2 min

Pressurization: 2.0 min

Column pressure: 29 psi

[NOTE—These GC conditions (oven temperature program and gas flow) should be optimized according to the instruments used.]

System suitability

Samples: *Standard solution A* and *Standard solution B*

Suitability requirements

Tailing factor: NMT 2.0, *Standard solution A*

Relative standard deviation: NMT 15.0%, *Standard solution A*

Signal-to-noise ratio: NLT 40, *Standard solution B*

[NOTE—The relative retention times (RRT) for methyl alcohol and methyl acetate may be around 0.55 and 1.0, respectively. These values are given for informational purposes only. RRT values may vary as per the chromatographic conditions.]

Analysis

Samples: *Blank*, *Standard solution A*, and *Sample solution*

Separately inject equal amounts (about 0.04 min) of the gaseous phase from the headspace vials containing 4.0 mL each of the *Blank*, *Standard solution A*, and *Sample solution* into the chromatographic system. Record the chromatograms and the peak response for each peak.

Calculate the percentages of methanol and methyl acetate in the portion of Polyvinyl Alcohol taken:



Documents

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