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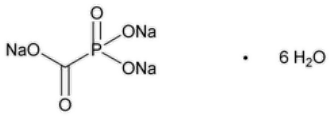
# Foscarnet Sodium



$CNa_3O_5P \cdot 6H_2O$ 300.04

Phosphinecarboxylic acid, dihydroxy-, oxide, trisodium salt, hexahydrate;

Phosphonoformic acid, trisodium salt, hexahydrate CAS RN®: 34156-56-4.

## DEFINITION

Foscarnet Sodium contains NLT 98.5% and NMT 101.0% of foscarnet sodium ($CNa_3O_5P$), calculated on the dried basis.

## IDENTIFICATION

***Change to read:***

• **A.** ▲Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*: **197K**▲ (CN 1-May-2020)

• **B.** Identification Tests—General, *Sodium* ⟨191⟩**:** Meets the requirements

## ASSAY

• **Procedure**

**Sample solution:** 0.2 g of Foscarnet Sodium in 50 mL of water

**Titrimetric system**

**Mode:** Direct titration

**Titrant:** 0.05 M sulfuric acid

**Endpoint detection:** Potentiometric

**Analysis:** Titrate the *Sample solution* with *Titrant,* determining the endpoint at the first inflection point. Each mL of 0.05 M sulfuric acid is equivalent to 19.20 mg of foscarnet sodium ($CNa_3O_5P$).

**Acceptance criteria:** 98.5%–101.0% on the dried basis

## IMPURITIES

• **Limit of Phosphate and Phosphite**

**Mobile phase:** Dissolve 0.1 g of monobasic potassium phthalate in water. Add 2.5 mL of 1 M nitric acid, and dilute with water to 1000 mL.

**Standard stock solution 1:** 0.28 mg/mL of sodium dihydrogen phosphate monohydrate in water

**Standard stock solution 2:** 0.43 mg/mL of sodium phosphite pentahydrate in water

**Standard solution:** Transfer 1 mL each of *Standard stock solution 1* and *Standard stock solution 2* to a 25-mL volumetric flask, and dilute with water to volume.

**Sample solution:** 2.4 mg/mL of Foscarnet Sodium in water

**Chromatographic system**

(See *Chromatography* ⟨621⟩, *System Suitability*.)

**Mode:** LC

**Detector:** UV 290 nm

**Column:** 4.6-mm × 5-cm; packing L23

**Flow rate:** 1.4 mL/min

**Injection volume:** 20 µL

**System suitability**

**Sample:** *Standard solution*

**Suitability requirements**

**Resolution:** NLT 2.0 between phosphate and phosphite

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

**Acceptance criteria:** The peak area of phosphate and phosphite from the *Sample solution* is NMT the area of the corresponding peak of the *Standard solution* (0.3% of phosphate and 0.3% of phosphite).

• **Limit of Foscarnet Related Compound B, Unknown Impurities, and Total Impurities**

**Solution A:** Dissolve 3.2 g of sodium sulfate decahydrate in water. Add 3 mL of glacial acetic acid and 6 mL of 0.1 M sodium pyrophosphate, and dilute with water to 1000 mL.

**Solution B:** Dissolve 3.2 g of sodium sulfate decahydrate in water. Add 6.8 g of sodium acetate and 6 mL of 0.1 M sodium pyrophosphate, and dilute with water to 1000 mL.

**Mobile phase:** *Solution A* and *Solution B* (70:30). [Note—The pH of this mixture is about 4.4.] To 1000 mL of this solution add 0.25 g of tetrahexylammonium hydrogen sulfate and 100 mL of methanol.

**Sample solution:** 2.5 mg/mL of Foscarnet Sodium in *Mobile phase*

**System suitability solution:** Transfer 2.0 mL of the *Sample solution* into a 50-mL volumetric flask. Add 5.0 mg of USP Foscarnet Related Compound B RS, and dilute with *Mobile phase* to volume.

**Standard solution:** 5.0 µg/mL of Foscarnet Sodium from the *Sample solution* in *Mobile phase*

**Chromatographic system**

(See *Chromatography ⟨621⟩, System Suitability*.)

**Mode:** LC

**Detector:** UV 230 nm

**Column:** 4.6-mm × 10-cm; 3-µm packing L1

**Flow rate:** 1 mL/min

**Injection volume:** 20 µL

**Run time:** 2.5 times the retention time of foscarnet

**System suitability**

**Sample:** *System suitability solution*

**Suitability requirements**

**Resolution:** NLT 7 between foscarnet and foscarnet related compound B

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

**Acceptance criteria:** The peak area of any individual impurity from the *Sample solution* is NMT the area of the major peak of the *Standard solution* (0.2%); the sum of all the peak areas, apart from the major peak, of the *Sample solution* is NMT twice the area of the major peak of the *Standard solution* (0.4%). Disregard any peak with a relative retention time less than 0.6 and any peak with an area less than 0.2 times that of the peak of the *Standard solution*.

• **Limit of Foscarnet Related Compound D**

**Standard solution:** 25 µg/mL of USP Foscarnet Related Compound D RS in alcohol

**Sample solution:** Dissolve 250 mg of Foscarnet Sodium in 9 mL of 0.1 M acetic acid, and add 1 mL of alcohol.

**Chromatographic system**

(See *Chromatography ⟨621⟩, System Suitability*.)

**Mode:** GC

**Detector:** Flame ionization

**Column:** 0.31-mm × 25-m; 0.5-µm coating of phase G27

**Temperatures**

**Injector:** 200°

**Detector:** 250°

**Column:** See *Table 1*.

**Table 1**

| Time (min) | Temperature Ramp (°/min) | Temperature (°) |
|---|---|---|
| 0 | 0 | 100 |
| 8 | 10 | 180 |

**Carrier gas:** Helium

**Flow rate:** 1 mL/min

**Injection volume:** 3 µL

**Injection type:** Split (1:20)

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

**Acceptance criteria**

**Individual impurities:** The peak area of foscarnet related compound D from the *Sample solution* is NMT the peak area of the *Standard solution* (0.1%).

**SPECIFIC TESTS**

- **pH** ⟨791⟩

  **Sample solution:** 20 mg/mL of Foscarnet Sodium in a carbon dioxide-free aqueous solution

  **Acceptance criteria:** 9.0–11.0

- **Loss on Drying** ⟨731⟩

  **Sample:** 0.1 g

  **Analysis:** Dry the *Sample* at 150° for at least 15 min.

  **Acceptance criteria:** 35.0%–37.0%

**ADDITIONAL REQUIREMENTS**

- **Packaging and Storage:** Preserve in tight, light-resistant containers, and store at room temperature.
- **USP Reference Standards** ⟨11⟩

USP Foscarnet Related Compound B RS

Disodium (ethoxyoxidophosphanyl)formate.

$C_3H_5Na_2O_5P$ 198.02

USP Foscarnet Related Compound D RS

*O*,*O*-Diethyl ethoxycarbonylphosphonate.

$C_7H_{15}O_5P$ 210.16

USP Foscarnet Sodium RS

**Auxiliary Information** - Please check for your question in the FAQs before contacting USP.

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| FOSCARNET SODIUM | Documentary Standards Support | SM12020 Small Molecules 1 |

**Chromatographic Database Information:** Chromatographic Database

**Most Recently Appeared In:**
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