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Add the following:

▲Valganciclovir for Oral Solution

DEFINITION

Valganciclovir for Oral Solution contains an amount of valganciclovir hydrochloride ($C_{14}H_{22}N_6O_5 \cdot HCl$) equivalent to NLT 90.0% and NMT 110.0% of the labeled amount of valganciclovir ($C_{14}H_{22}N_6O_5$).

IDENTIFICATION

• **A.** The retention times of the diastereomeric peaks of the *Sample solution* correspond to those of the *Standard solution*, as obtained in the *Assay*.

• **B.** The UV spectra of the major peaks of the *Sample solution* correspond to those of the *Standard solution*, as obtained in the *Assay*.

ASSAY

• **Procedure**

Solution A: 5.75 g/L of ammonium phosphate dibasic in water. Adjust with phosphoric acid to a pH of 2.8.

Solution B: Methanol

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	95	5
18	95	5
25	80	20
35	70	30
40	70	30
40.1	95	5
55	95	5

Diluent: 1 mM hydrochloric acid

Standard solution: 0.3 mg/mL of USP Valganciclovir Hydrochloride RS in *Diluent*

Sample stock solution: Nominally 30 mg/mL of valganciclovir in water prepared as follows. Add 100 mL of water to each of 5 sample bottles of Valganciclovir for Oral Solution and shake well to dissolve the powder. Quantitatively transfer the solutions to a 1000-mL volumetric flask. Dilute with water to volume.

Sample solution: Nominally 0.3 mg/mL of valganciclovir in *Diluent* prepared from the *Sample stock solution*

Chromatographic system

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

Mode: LC

Detector: UV 254 nm. For *Identification B*, use a diode array detector in the range of 200–400 nm.

Column: 4.6-mm × 15-cm; 3.5-µm packing L1

Autosampler temperature: 5°

Flow rate: 1 mL/min

Injection volume: 20 µL

System suitability

Sample: *Standard solution*

[NOTE—The relative retention times for the two valganciclovir diastereomer peaks are 0.86 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 3.0 between the two valganciclovir diastereomer peaks

Tailing factor: NMT 2.0 for the second valganciclovir diastereomer peak

Relative standard deviation: NMT 2.0% for the total areas of the two valganciclovir diastereomer peaks

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of valganciclovir ($C_{14}H_{22}N_6O_5$) in the portion of Oral Solution taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (M_{r1}/M_{r2}) \times 100$$

r_U = sum of the peak responses of the valganciclovir diastereomer peaks from the *Sample solution*

r_S = sum of the peak responses of the valganciclovir diastereomer peaks from the *Standard solution*

C_S = concentration of USP Valganciclovir Hydrochloride RS in the *Standard solution* (mg/mL)

C_U = nominal concentration of valganciclovir in the *Sample solution* (mg/mL)

M_{r1} = molecular weight of valganciclovir, 354.37

M_{r2} = molecular weight of valganciclovir hydrochloride, 390.83

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

• **UNIFORMITY OF DOSAGE UNITS ⟨905⟩:** Meets the requirements

IMPURITIES

• **ORGANIC IMPURITIES**

Solution A, Solution B, Mobile phase, Diluent, Sample stock solution, Sample solution, and **Chromatographic system:** Proceed as directed in the *Assay*.

Standard solution: 0.3 µg/mL of USP Valganciclovir Hydrochloride RS in *Diluent* prepared from the *Standard solution* in the *Assay*

System suitability

Sample: *Standard solution*

Suitability requirements

Resolution: NLT 3.0 between the two valganciclovir diastereomer peaks

Relative standard deviation: NMT 5.0% for the total areas of the two valganciclovir diastereomer peaks

Signal-to-noise ratio: NLT 10 each for the two valganciclovir diastereomer peaks

Analysis

Samples: *Standard solution* and *Sample solution*

[NOTE—The relative retention times for methoxymethylguanine, valganciclovir diester analog, isovalganciclovir peak 1, and isovalganciclovir peak 2 are 0.70, 1.54, 1.65, and 1.70, respectively.]

Calculate the percentage of any degradation product in the portion of Oral Solution taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (M_{r1}/M_{r2}) \times (1/F) \times 100$$

r_U = peak response of any degradation product from the *Sample solution*

r_S = sum of the peak responses of the valganciclovir diastereomeric peaks from the *Standard solution*

C_S = concentration of USP Valganciclovir Hydrochloride RS in the *Standard solution* (mg/mL)

C_U = nominal concentration of valganciclovir in the *Sample solution* (mg/mL)

M_{r1} = molecular weight of valganciclovir, 354.37

M_{r2} = molecular weight of valganciclovir hydrochloride, 390.83

F = relative response factor (see *Table 2*)

Acceptance criteria: See *Table 2*. Disregard the peak due to fumaric acid at an RRT of about 0.30. The reporting threshold is 0.05%.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Guanine[a]	0.20	1.7	1.0
Ganciclovir[b]	0.35	1.4	2.5
Valganciclovir diastereomer peak 1	0.86	—	—
Valganciclovir diastereomer peak 2	1.00	—	—
Any unspecified degradation product	—	1.0	0.2
Total degradation products	—	—	4.5

[a] 2-Amino-1,9-dihydro-6*H*-purin-6-one.

[b] 2-Amino-9-{[(1,3-dihydroxypropan-2-yl)oxy]methyl}-1,9-dihydro-6*H*-purin-6-one.

SPECIFIC TESTS

• **pH ⟨791⟩:** 2.0–3.8

• **Water Determination ⟨921⟩, *Method I*:** NMT 8.0%

• **Microbial Enumeration Tests ⟨61⟩** and **Tests for Specified Microorganisms ⟨62⟩:** The total aerobic microbial count does not exceed 10^2 cfu/mL. The total combined yeasts and molds count does not exceed 10^1 cfu/mL. It meets the requirements of the test for absence of *Escherichia coli*.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in well-closed containers, protected from light and moisture. Store dry powder at controlled room temperature. Store constituted solution under refrigeration (2°–8°). Do not freeze.

• **USP Reference Standards ⟨11⟩**

USP Valganciclovir Hydrochloride RS▲ (USP 1-May-2024)

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

Topic/Question	Contact	Expert Committee
VALGANCICLOVIR FOR ORAL SOLUTION	Documentary Standards Support	SM12020 Small Molecules 1
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM12020 Small Molecules 1

Chromatographic Database Information: Chromatographic Database

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