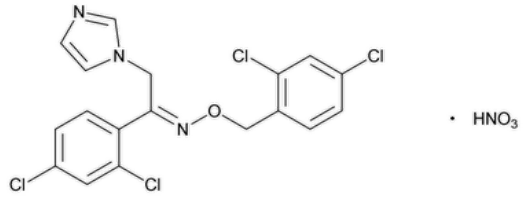
Status: Currently Official on 16-Feb-2025
Official Date: Official as of 01-May-2022
Document Type: USP Monographs
DocId: GUID-D0EF6091-7540-407B-B415-A2A3CF82C51D_2_en-US
DOI: https://doi.org/10.31003/USPNF_M59300_02_01
DOI Ref: j6s27



***Add the following:***

# ▲Oxiconazole Nitrate



$C_{18}H_{13}Cl_4N_3O \cdot HNO_3$ 492.14

Ethanone, 1-(2,4-dichlorophenyl)-2-(1*H*-imidazol-1-yl)-, *O*-[(2,4-dichlorophenyl)methyl]oxime, (*Z*)-, mononitrate;

2',4'-Dichloro-2-imidazol-1-ylacetophenone (*Z*)-[*O*-(2,4-dichlorobenzyl)oxime], mononitrate CAS RN®: 64211-46-7; UNII: RQ8UL4C17S.

## DEFINITION

Oxiconazole Nitrate contains NLT 98.0% and NMT 102.0% of oxiconazole nitrate ($C_{18}H_{13}Cl_4N_3O \cdot HNO_3$), calculated on the dried basis.

## IDENTIFICATION

• **A.** **Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*:** 197K or 197A

• **B.** The retention time of the oxiconazole peak of the *Sample solution* corresponds to that of *Standard solution*, as obtained in the *Assay*.

## ASSAY

• **Procedure**

**Solution A:** 2.72 g/L of monobasic potassium phosphate in water

**Mobile phase:** Acetonitrile and *Solution A* (44:56). Adjust with phosphoric acid to a pH of 4.4.

**Diluent:** Acetonitrile and water (50:50)

**Standard solution:** 0.2 mg/mL of USP Oxiconazole Nitrate RS in *Diluent*. Sonicate, if necessary, to dissolve.

**Sample solution:** 0.2 mg/mL of Oxiconazole Nitrate in *Diluent*. Sonicate, if necessary, to dissolve.

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 220 nm

**Column:** 4.6-mm × 15-cm; 3-µm packing L1

**Column temperature:** 40°

**Flow rate:** 1.2 mL/min

**Injection volume:** 10 µL

**System suitability**

**Sample:** *Standard solution*

**Suitability requirements**

**Tailing factor:** NMT 2.0

**Relative standard deviation:** NMT 0.73%

**Analysis**

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

Calculate the percentage of oxiconazole nitrate ($C_{18}H_{13}Cl_4N_3O \cdot HNO_3$) in the portion of Oxiconazole Nitrate taken:

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

$r_U$ = peak response of oxiconazole from the *Sample solution*

$r_S$ = peak response of oxiconazole from the *Standard solution*

$C_S$ = concentration of USP Oxiconazole Nitrate RS in the *Standard solution* (mg/mL)

$C_U$ = concentration of Oxiconazole Nitrate in the *Sample solution* (mg/mL)

**Acceptance criteria:** 98.0%–102.0% on the dried basis

## IMPURITIES

• **Residue on Ignition ⟨281⟩:** NMT 0.2%

• **Organic Impurities**

[Note—Protect solutions containing oxiconazole from light and store in a refrigerator until ready to use.]

**Buffer:** 2.64 g/L of dibasic ammonium phosphate in water. Adjust with phosphoric acid to a pH of 7.0.

**Solution A:** Acetonitrile and *Buffer* (30:70)

**Solution B:** Acetonitrile

**Mobile phase:** See *Table 1*.

**Table 1**

| Time (min) | Solution A (%) | Solution B (%) |
|---|---|---|
| 0 | 100 | 0 |
| 7 | 43 | 57 |
| 15 | 43 | 57 |
| 18 | 71 | 29 |
| 25 | 71 | 29 |
| 27 | 28 | 72 |
| 30 | 28 | 72 |
| 31 | 100 | 0 |
| 35 | 100 | 0 |

**Standard stock solution 1:** 1 mg/mL of USP Oxiconazole Nitrate RS in acetonitrile

**Standard stock solution 2:** 0.1 mg/mL each of USP Oxiconazole Related Compound A RS, USP Oxiconazole Related Compound B RS, USP Oxiconazole Related Compound C RS, USP Oxiconazole Related Compound D RS, and USP Oxiconazole Related Compound E RS in acetonitrile

**Sensitivity solution:** 0.5 µg/mL of USP Oxiconazole Nitrate RS from *Standard stock solution 1* in acetonitrile

**Standard solution:** 0.002 mg/mL of USP Oxiconazole Nitrate RS from *Standard stock solution 1* and 0.002 mg/mL each of USP Oxiconazole Related Compound A RS, USP Oxiconazole Related Compound B RS, USP Oxiconazole Related Compound C RS, USP Oxiconazole Related Compound D RS, and USP Oxiconazole Related Compound E RS from *Standard stock solution 2* in acetonitrile

**Sample solution:** 1 mg/mL of Oxiconazole Nitrate in acetonitrile

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 250 nm for oxiconazole related compound C and 225 nm for the remaining impurities

**Column:** 4.6-mm × 25-cm; 5-µm packing L1

**Column temperature:** 40°

**Flow rate:** 1 mL/min

**Injection volume:** 20 µL

**System suitability**

**Samples:** *Sensitivity solution* and *Standard solution*

**Suitability requirements**

**Resolution:** NLT 1.2 between oxiconazole related compound A and oxiconazole determined at 225 nm, *Standard solution*

**Relative standard deviation:** NMT 5.0% for the oxiconazole peak determined at 225 nm, *Standard solution*

**Signal-to-noise ratio:** NLT 10 determined at 225 nm, *Sensitivity solution*

**Analysis**

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

Calculate the percentage of oxiconazole related compound A, B, C, D, and E in the portion of Oxiconazole Nitrate taken:

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

$r_U$ = peak response of the relevant oxiconazole related compound from the *Sample solution*

$r_S$ = peak response of the relevant oxiconazole related compound from the *Standard solution*

$C_S$ = concentration of the corresponding USP Reference Standard in the *Standard solution* (mg/mL)

$C_U$ = concentration of Oxiconazole Nitrate in the *Sample solution* (mg/mL)

Calculate the percentage of any other individual impurity in the portion of Oxiconazole Nitrate taken:

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

$r_U$ = peak response of any other individual impurity from the *Sample solution*

$r_S$ = peak response of oxiconazole from the *Standard solution*

$C_S$ = concentration of USP Oxiconazole Nitrate RS in the *Standard solution* (mg/mL)

$C_U$ = concentration of Oxiconazole Nitrate in the *Sample solution* (mg/mL)

**Acceptance criteria:** See *Table 2*. The reporting threshold is 0.05%.

**Table 2**

| Name | Relative Retention Time | Wavelength (nm) | Acceptance Criteria, NMT (%) |
|---|---|---|---|
| Oxiconazole related compound B | 0.35 | 225 | 0.15 |
| Oxiconazole related compound C | 0.42 | 250 | 0.15 |
| Oxiconazole related compound D | 0.47 | 225 | 0.15 |
| Oxiconazole related compound E | 0.81 | 225 | 0.15 |
| Oxiconazole related compound A | 0.95 | 225 | 0.15 |
| Oxiconazole | 1.0 | 225/250 | — |
| Any individual unspecified impurity | — | 225 | 0.10 |
| Total impurities | — | — | 0.5 |

**SPECIFIC TESTS**

• **Loss on Drying** ⟨731⟩

**Analysis:** Dry at 105° for 4 h.

**Acceptance criteria:** NMT 1.0%

• **pH** ⟨791⟩

**Sample:** 10 mg/mL suspension in water

**Acceptance criteria:** 3.0–4.0

**ADDITIONAL REQUIREMENTS**

• **Packaging and Storage:** Preserve in tight containers, and store at room temperature.

• **USP Reference Standards** ⟨11⟩

USP Oxiconazole Nitrate RS

USP Oxiconazole Related Compound A RS

2',4'-Dichloro-2-imidazol-1-ylacetophenone (*E*)-[*O*-(2,4-dichlorobenzyl)oxime], mononitrate.

$C_{18}H_{13}Cl_4N_3O$ 429.14

USP Oxiconazole Related Compound B RS

(*Z*)-1-(2,4-Dichlorophenyl)-2-(1*H*-imidazol-1-yl)ethanone oxime.

$C_{11}H_9Cl_2N_3O$ 270.11

USP Oxiconazole Related Compound C RS

1-(2,4-Dichlorophenyl)-2-(1*H*-imidazol-1-yl)ethan-1-one hydrochloride.

$C_{11}H_8Cl_2N_2O \cdot HCl$ 291.56

USP Oxiconazole Related Compound D RS

(2,4-Dichlorophenyl)methanol.

$C_7H_6Cl_2O$ 177.02

USP Oxiconazole Related Compound E RS

2,4-Dichlorobenzyl chloride.

$C_7H_5Cl_3$ 195.47▲ (USP 1-May-2022)

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

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| OXICONAZOLE NITRATE | Documentary Standards Support | SM12020 Small Molecules 1 |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br>RSTECH@usp.org | SM12020 Small Molecules 1 |

**Chromatographic Database Information:** Chromatographic Database

**Most Recently Appeared In:**
Pharmacopeial Forum: Volume No. 45(2)

**Current DocID: GUID-D0EF6091-7540-407B-B415-A2A3CF82C51D_2_en-US**

**DOI: https://doi.org/10.31003/USPNF_M59300_02_01**

**DOI ref: j6s27**