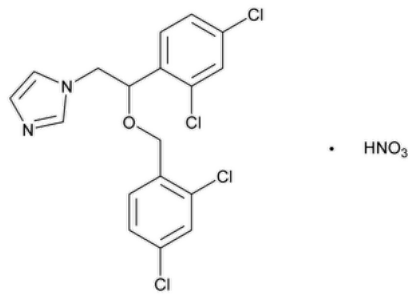


Status: Currently Official on 15-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-7CCCB3E-7A51-4092-82E8-21DBD7C3EBC0_8_en-US
DOI: https://doi.org/10.31003/USPNF_M53990_08_01
DOI Ref: 1c7b4

© 2025 USPC
Do not distribute

Miconazole Nitrate

To view the Notice from the Expert Committee that posted in conjunction with this accelerated revision, please click www.uspnf.com/rb-miconazole-nitrate-20190501



$C_{18}H_{14}Cl_4N_2O \cdot HNO_3$ 479.14
1*H*-Imidazole, 1-[2-(2,4-dichlorophenyl)-2-[(2,4-dichlorophenyl)methoxy]ethyl]-, mononitrate;
1-[2,4-Dichloro-β-[(2,4-dichlorobenzyl)oxy]phenethyl]imidazole mononitrate CAS RN[®]: 22832-87-7; UNII: VW4H1CYW1K.

DEFINITION

Miconazole Nitrate contains NLT 98.0% and NMT 102.0% of miconazole nitrate ($C_{18}H_{14}Cl_4N_2O \cdot HNO_3$), calculated on the dried basis.

IDENTIFICATION

Change to read:

- **A.** ▲ **SPECTROSCOPIC IDENTIFICATION TESTS** (197), *Infrared Spectroscopy*: 197A or 197K▲ (CN 1-May-2020)
- **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.

ASSAY

• **PROCEDURE**

Solution A: [Methanol](#), [water](#), and [1 M triethylammonium acetate](#) (30:70:1)
Solution B: [Acetonitrile](#), [methanol](#), and [1 M triethylammonium acetate](#) (25:75:0.2)
Mobile phase: See [Table 1](#).

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	70	30
5	70	30
10	44	56
27	44	56
30	25	75
35	25	75
36	70	30
40	70	30

Diluent: [Methanol](#) and [water](#) (70:30)

System suitability solution: 0.1 mg/mL of [USP Miconazole Nitrate RS](#) and 6 µg/mL of [USP Miconazole Related Compound F RS](#) in *Diluent*.
 Sonication may be needed to aid dissolution.

Standard solution: 0.1 mg/mL of [USP Miconazole Nitrate RS](#) in *Diluent*. Sonication may be needed to aid dissolution.

Sample solution: 0.1 mg/mL of Miconazole Nitrate in *Diluent*. Sonication may be needed to aid dissolution.

Chromatographic system

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

Mode: LC

Detector: UV 215 nm

Column: 4.6-mm × 10-cm; 2.6-µm packing [L11](#)

Column temperature: 40°

Flow rate: 0.8 mL/min

Injection volume: 10 µL

System suitability

Samples: *System suitability solution* and *Standard solution*

[NOTE—The relative retention times for miconazole related compound F and miconazole are 0.96 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 1.5 between miconazole related compound F and miconazole, *System suitability solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 0.73%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of miconazole nitrate ($C_{18}H_{14}Cl_4N_2O \cdot HNO_3$) in the portion of Miconazole Nitrate taken:

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

r_U = peak response of miconazole from the *Sample solution*

r_S = peak response of miconazole from the *Standard solution*

C_S = concentration of [USP Miconazole Nitrate RS](#) in the *Standard solution* (mg/mL)

C_U = concentration of Miconazole 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**

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

Standard solution: 1.2 µg/mL each of [USP Miconazole Nitrate RS](#), [USP Econazole Nitrate RS](#), [USP Miconazole Related Compound C RS](#), [USP Miconazole Related Compound F RS](#), and [USP Miconazole Related Compound I RS](#) in *Diluent*

Sample solution: 600 µg/mL of Miconazole Nitrate in *Diluent*. Sonication may be needed to aid dissolution.

System suitability

Sample: *Standard solution*

[NOTE—See [Table 2](#) for relative retention times.]

Suitability requirements

Resolution: NLT 1.5 between miconazole related compound C and miconazole related compound I; NLT 1.5 between miconazole related compound I and econazole; and NLT 1.5 between miconazole related compound F and miconazole

Relative standard deviation: NMT 3.0% for miconazole

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of miconazole related compound C, miconazole related compound F, miconazole related compound I, or econazole nitrate in the portion of Miconazole Nitrate taken:

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

r_U = peak response of miconazole related compound C, miconazole related compound F, miconazole related compound I, or econazole nitrate from the *Sample solution*

r_S = peak response of miconazole related compound C, miconazole related compound F, miconazole related compound I, or econazole nitrate from the *Standard solution*

C_S = concentration of [USP Miconazole Related Compound C RS](#), [USP Miconazole Related Compound F RS](#), [USP Miconazole Related Compound I RS](#), or [USP Econazole Nitrate RS](#) in the *Standard solution* (µg/mL)

C_U = concentration of Miconazole Nitrate in the *Sample solution* (µg/mL)

Calculate the percentage of each specified and any individual unspecified impurity in the portion of Miconazole Nitrate taken:

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

r_U = peak response of each specified and any individual unspecified impurity from the *Sample solution*

r_S = peak response of miconazole from the *Standard solution*

C_S = concentration of [USP Miconazole Nitrate RS](#) in the *Standard solution* (µg/mL)

C_U = concentration of Miconazole Nitrate in the *Sample solution* (µg/mL)

Acceptance criteria: See [Table 2](#).

Table 2

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Deschlorobenzyl econazole ^a	0.22	0.25
Miconazole quarternary salt ^b	0.57	0.25
Miconazole benzyl analog ^c	0.65	0.25
Miconazole related compound C	0.74	0.25
Miconazole related compound I	0.76	0.25
Econazole nitrate	0.78	0.25
Miconazole 2,6-isomer ^d	0.87	0.25
Miconazole 2,5-isomer ^e	0.94	0.25
Miconazole related compound F	0.96	0.25
Miconazole	1.0	—
Any individual unspecified impurity	—	0.10
Total impurities	—	0.5

^a 1-(2,4-Dichlorophenyl)-2-(1*H*-imidazol-1-yl)ethanol.

^b 2-(3-{2-[(2,4-Dichlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethyl}-1*H*-imidazol-3-ium-1-yl)-2-methylpropanoate.

^c 1-[2-(Benzyloxy)-2-(2,4-dichlorophenyl)ethyl]-1*H*-imidazole.

^d 1-[2-[(2,6-Dichlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethyl]-1*H*-imidazole.

^e 1-[2-[(2,5-Dichlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethyl]-1*H*-imidazole.

SPECIFIC TESTS

Change to read:

- ▲ **OPTICAL ROTATION** (781A), *Procedures, Angular Rotation* ▲ (RB 1-MAY-2019)

Sample solution: 10 mg/mL of Miconazole Nitrate in [methanol](#)

Acceptance criteria: -0.10° to +0.10° ▲ at 20° ▲ (RB 1-May-2019)

- ▲ **LOSS ON DRYING** (731)

Analysis: Dry at 105° for 2 h.

Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

• **PACKAGING AND STORAGE:** Preserve in well-closed containers, protected from light. Store at controlled room temperature.

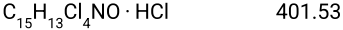
• **USP REFERENCE STANDARDS (11).**

[USP Econazole Nitrate RS](#)

[USP Miconazole Nitrate RS](#)

[USP Miconazole Related Compound C RS](#)

2-[(2,4-Dichlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethan-1-amine hydrochloride.



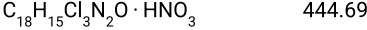
[USP Miconazole Related Compound F RS](#)

1-{2-[(3,4-Dichlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethyl}-1*H*-imidazole.



[USP Miconazole Related Compound I RS](#)

1-{2-[(2-Chlorobenzyl)oxy]-2-(2,4-dichlorophenyl)ethyl}-1*H*-imidazole mononitrate.



Auxiliary Information - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
MICONAZOLE NITRATE	Documentary Standards Support	SM12020 Small Molecules 1

Chromatographic Database Information: [Chromatographic Database](#)

Most Recently Appeared In:

Pharmacopeial Forum: Volume No. PF 43(2)

Current DocID: GUID-7CCCBA3E-7A51-4092-82E8-21DBD7C3EBC0_8_en-US

DOI: https://doi.org/10.31003/USPNF_M53990_08_01

DOI ref: [1c7b4](#)

OFFICIAL