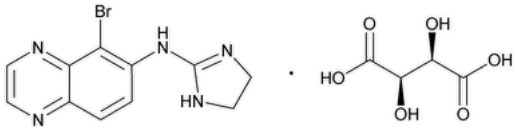
Status: Currently Official on 14-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-0E796674-ADAC-4ECF-9D58-498229A370E6_6_en-US
DOI: https://doi.org/10.31003/USPNF_M10200_06_01
DOI Ref: ab3t1

Brimonidine Tartrate



$C_{11}H_{10}BrN_5 \cdot C_4H_6O_6$ 442.22

6-Quinoxalinamine, 5-bromo-*N*-(4,5-dihydro-1*H*-imidazol-2-yl)-, [*R*-(*R**,*R**)]-2,3-dihydroxybutanedioate (1:1);

5-Bromo-6-(2-imidazolin-2-ylamino)quinoxaline L-tartrate (1:1). CAS RN®: 70359-46-5.

DEFINITION

Brimonidine Tartrate contains NLT 98.0% and NMT 102.0% of brimonidine tartrate ($C_{11}H_{10}BrN_5 \cdot C_4H_6O_6$), calculated on the dried basis.

IDENTIFICATION

Change to read:

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

Protect the solutions containing brimonidine tartrate from light.

Mobile phase: In a 1-L volumetric flask, dissolve 2.6 g of sodium 1-heptanesulfonate in 310 mL of methanol, add 2.5 mL of triethylamine and 7.5 mL of glacial acetic acid, and dilute with water to volume.

Standard solution: 1.3 mg/mL of USP Brimonidine Tartrate RS in water

Sample solution: 1.3 mg/mL of Brimonidine Tartrate in water

Chromatographic system

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

Mode: LC

Detector: UV 264 nm

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

Column temperature: 30°

Flow rate: 1 mL/min

Injection volume: 20 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 1.5

Relative standard deviation: NMT 0.73%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of brimonidine tartrate ($C_{11}H_{10}BrN_5 \cdot C_4H_6O_6$) in the portion of Brimonidine Tartrate taken:

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

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

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

C_U = concentration of Brimonidine Tartrate in the *Sample solution* (mg/mL)

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

IMPURITIES

• **Residue on Ignition ⟨281⟩:** NMT 0.3%

• **Organic Impurities**

Protect the solutions containing brimonidine tartrate and related substances from light.

Mobile phase: Proceed as directed in the *Assay*.

System suitability solution: 1.3 mg/mL of USP Brimonidine Tartrate RS and 1.3 µg/mL of USP Brimonidine Related Compound E RS in water

Sensitivity solution: 0.65 µg/mL of USP Brimonidine Tartrate RS in water

Standard solution: 1.3 µg/mL of USP Brimonidine Tartrate RS in water

Sample solution: 1.3 mg/mL of Brimonidine Tartrate in water

Chromatographic system: Proceed as directed in the *Assay*, except for the *Run time*.

Run time: NLT 3 times the retention time of brimonidine

System suitability

Samples: *System suitability solution* and *Sensitivity solution*

[Note—The relative retention times for brimonidine related compound E and brimonidine are about 0.93 and 1.00, respectively.]

Suitability requirements

Resolution: NLT 1.5 between brimonidine related compound E and brimonidine, *System suitability solution*

Signal-to-noise ratio: NLT 10, *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Brimonidine Tartrate taken:

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

r_U = peak response of each individual impurity from the *Sample solution*

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

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

C_U = concentration of Brimonidine Tartrate in the *Sample solution* (mg/mL)

Acceptance criteria: See *Table 1*. Disregard the tartrate peak at a relative retention time of 0.09. The reporting threshold is 0.05%.

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Desbromobrimonidine[a]	0.86	0.1
Brimonidine	1.00	—
Any individual unspecified impurity	—	0.1
Total impurities	—	0.3

[a] *N*-(Quinoxalin-6-yl)imidazolidin-2-imine.

SPECIFIC TESTS

• **Optical Rotation ⟨781S⟩, *Procedures, Specific Rotation***

Sample solution: 10 mg/mL in water

Acceptance criteria: +9.0° to +10.5°

• **Loss on Drying ⟨731⟩**

Analysis: Dry 1 g at 105° for 3 h.

Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in well-closed, light-resistant containers, and store at room temperature.

• **USP Reference Standards ⟨11⟩**

USP Brimonidine Tartrate RS

USP Brimonidine Related Compound E RS

2-(5-Bromoquinoxalin-6-yl)guanidine.

$C_9H_8BrN_5$ 266.10

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

Topic/Question	Contact	Expert Committee
BRIMONIDINE TARTRATE	Documentary Standards Support	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. PF 42(4)

Current DocID: GUID-0E796674-ADAC-4ECF-9D58-498229A370E6_6_en-US

DOI: https://doi.org/10.31003/USPNF_M10200_06_01

DOI ref: ab3t1