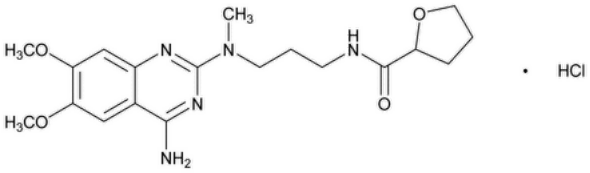
Status: Currently Official on 17-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-664CF726-57C4-4BE6-9B38-34646B5F7BE0_2_en-US
DOI: https://doi.org/10.31003/USPNF_M891_02_01
DOI Ref: qla0v

Alfuzosin Hydrochloride



$C_{19}H_{27}N_5O_4 \cdot HCl$ 425.91

2-Furancarboxamide, *N*-[3-[(4-amino-6,7-dimethoxy-2-quinazolinyl)methylamino]propyl]tetrahydro-, monohydrochloride (±);
(±)-*N*-[3-[(4-Amino-6,7-dimethoxy-2-quinazolinyl)methylamino]propyl]tetrahydro-2-furamide monohydrochloride CAS RN®: 81403-68-1; UNII: 75046A1XTN.

DEFINITION

Alfuzosin Hydrochloride contains NLT 98.0% and NMT 102.0% of alfuzosin hydrochloride ($C_{19}H_{27}N_5O_4 \cdot HCl$), calculated on the anhydrous and solvent-free basis.

IDENTIFICATION

Change to read:

- **A.** ▲Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*: **197K**▲ (CN 1-May-2020)
- **B.** Identification Tests—General, *Chloride* ⟨191⟩**:** Meets the requirements
- **C.** The retention time of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

- **Procedure**

[Note—Use low-actinic glassware.]

Solution A: 2 M sodium hydroxide

Solution B: 5.0 mL of perchloric acid in 900 mL of water. Adjust with *Solution A* to a pH of 3.5, and dilute with water to 1000 mL.

Mobile phase: Acetonitrile and *Solution B* (30:70)

Diluent: Methanol and *Solution A* (500:3)

Standard stock solution: 0.5 mg/mL of USP Alfuzosin Hydrochloride RS in *Diluent*

Standard solution: 0.04 mg/mL of USP Alfuzosin Hydrochloride RS in *Mobile phase* from the *Standard stock solution*; the solution is stable for 14 h at 5°.

Sample stock solution: 0.5 mg/mL of Alfuzosin Hydrochloride in *Diluent*

Sample solution: 0.04 mg/mL of Alfuzosin Hydrochloride in *Mobile phase* from the *Sample stock solution*; the solution is stable for 14 h at 5°.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

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

Column temperature: 30°

Autosampler temperature: 5°

Flow rate: 1.5 mL/min

Injection volume: 10 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Relative standard deviation: NMT 1.0%

Tailing factor: NMT 1.5

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of alfuzosin hydrochloride ($C_{19}H_{27}N_5O_4 \cdot HCl$) in the portion of Alfuzosin Hydrochloride 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 Alfuzosin Hydrochloride RS in the *Standard solution* (mg/mL)

C_U = concentration of Alfuzosin Hydrochloride in the *Sample solution* (mg/mL)

Acceptance criteria: 98.0%–102.0% on the anhydrous and solvent-free basis

IMPURITIES

- **Residue on Ignition ⟨281⟩:** NMT 0.1%
- **Organic Impurities**

Buffer: Dilute 5 mL of perchloric acid in 900 mL of water. Adjust with 2 M sodium hydroxide to a pH of 3.5, and dilute with water to 1 L.

Mobile phase: Acetonitrile, tetrahydrofuran, and *Buffer* (20:1:80)

System suitability solution: 0.4 mg/mL of USP Alfuzosin System Suitability Mixture RS in *Mobile phase*

Sample solution: 0.40 mg/mL of Alfuzosin Hydrochloride in *Mobile phase*

Reference solution: 0.40 µg/mL of Alfuzosin Hydrochloride in *Mobile phase* from the *Sample solution*

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm × 15-cm; 5-µm packing L1

Flow rate: 1.5 mL/min

Injection volume: 10 µL

System suitability

Sample: *System suitability solution*

Suitability requirements

Peak-to-valley ratio: The ratio of the height of the furamide analog peak to the height of the valley between the furamide analog peak and alfuzosin is NLT 5.

Analysis

Samples: *Sample solution* and *Reference solution*

Calculate the percentage of each impurity in the portion of Alfuzosin Hydrochloride taken:

$$\text{Result} = (r_U/r_S) \times (1/D) \times 100$$

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

r_S = peak response of alfuzosin from the *Reference solution*

D = dilution factor between the *Sample solution* and the *Reference solution*, 1000

Acceptance criteria: See *Table 1*. [Note—Disregard any peak with an area less than 0.05%.]

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Deacylatedalfuzosin[a]	0.5	0.20
Alfuzosin	1.0	—
Furamide analog[b]	1.2	—[c]
Any other individual, unidentified impurity	—	0.10
Total impurities	—	0.30

[a] N^2-(3-Aminopropyl)-6,7-dimethoxy-N^2-methylquinazoline-2,4-diamine.

[b] *N*-{3-[(4-Amino-6,7-dimethoxyquinazolin-2-yl)(methyl)amino]propyl}furan-2-carboxamide.

[c] Furamide analog, a component of USP Alfuzosin System Suitability Mixture RS, is not a specified impurity.

SPECIFIC TESTS

- **Optical Rotation** ⟨781⟩

  Sample solution: 20 mg/mL in carbon dioxide-free water

  Acceptance criteria: −0.10° to +0.10°

- **Water Determination, *Method I*** ⟨921⟩**:** NMT 2.0%

- **pH** ⟨791⟩

  Sample solution: 20 mg/mL in carbon dioxide-free water

  Acceptance criteria: 4.0–5.5

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers. Protect from light and humidity, and store at room temperature.

- **USP Reference Standards** ⟨11⟩

  USP Alfuzosin Hydrochloride RS

  USP Alfuzosin System Suitability Mixture RS

  Alfuzosin Hydrochloride containing approximately 0.4% furamide analog (*N*-{3-[(4-amino-6,7-dimethoxyquinazolin-2-yl)(methyl)amino]propyl}furan-2-carboxamide), and about 0.4% deacylated alfuzosin (N^2-(3-aminopropyl)-6,7-dimethoxy-N^2-methylquinazoline-2,4-diamine).

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

Topic/Question	Contact	Expert Committee
ALFUZOSIN HYDROCHLORIDE	Documentary Standards Support	SM52020 Small Molecules 5
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM52020 Small Molecules 5

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. PF 38(6)

Current DocID: GUID-664CF726-57C4-4BE6-9B38-34646B5F7BE0_2_en-US

DOI: https://doi.org/10.31003/USPNF_M891_02_01

DOI ref: qla0v