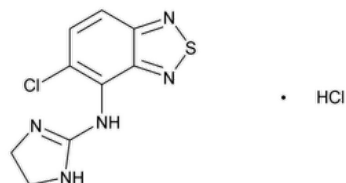


Status: Currently Official on 17-Feb-2025
 Official Date: Official as of 01-May-2021
 Document Type: USP Monographs
 DocId: GUID-85484A93-7C4F-4A60-96FE-0FEE3557CA1D_5_en-US
 DOI: https://doi.org/10.31003/USPNF_M83740_05_01
 DOI Ref: ue5dt

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Tizanidine Hydrochloride



$C_9H_8ClN_5S \cdot HCl$ 290.17

2,1,3-Benzothiadiazol-4-amine, 5-chloro-*N*-(4,5-dihydro-1*H*-imidazol-2-yl)-, monohydrochloride;

5-Chloro-4-(2-imidazolin-2-ylamino)-2,1,3-benzothiadiazole monohydrochloride CAS RN®: 64461-82-1; UNII: B53E3NMY5C.

DEFINITION

Tizanidine Hydrochloride contains NLT 98.0% and NMT 102.0% of tizanidine hydrochloride ($C_9H_8ClN_5S \cdot HCl$), calculated on the dried basis.

IDENTIFICATION

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

Change to read:

- **C. IDENTIFICATION TESTS—GENERAL** (191), *Chemical Identification Tests, Chloride*

Sample solution: 10 mg/mL

Acceptance criteria: Meets the requirements ▲▲ (USP 1-May-2021)

ASSAY

Change to read:

• PROCEDURE

Buffer: 6.8 g/L of [monobasic potassium phosphate](#). Adjust with 5.3 N [potassium hydroxide](#) to a pH of 7.5 ± 0.05 .

Mobile phase: [Acetonitrile](#) and *Buffer* (20:80)

System suitability solution: 46 µg/mL of [USP Tizanidine Hydrochloride RS](#) and 0.12 µg/mL of [USP Tizanidine Related Compound C RS](#) in *Mobile phase*

Standard solution: 0.046 mg/mL of [USP Tizanidine Hydrochloride RS](#) in *Mobile phase*

Sample solution: 0.046 mg/mL of Tizanidine Hydrochloride in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 230 nm

Column: 4.6-mm × 15-cm; packing [L7](#)

Column temperature: 35°

Flow rate: 1 mL/min

Injection volume: 20 µL

▲**Run time:** NLT 2.3 times the retention time of tizanidine ▲ (USP 1-May-2021)

System suitability

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

[NOTE—The relative retention times for tizanidine related compound C and tizanidine are 0.5 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 6 between tizanidine and tizanidine related compound C, *System suitability solution*

Tailing factor: NMT 2.0 for tizanidine, *Standard solution*



Relative standard deviation: NMT $\blacktriangle$ 0.73%, $\blacktriangle$ (USP 1-May-2021) *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of tizanidine hydrochloride ($C_9H_8ClN_5S \cdot HCl$) in the portion of Tizanidine Hydrochloride taken:

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

r_U = peak area of tizanidine from the *Sample solution*

r_S = peak area of tizanidine from the *Standard solution*

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

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

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

IMPURITIES

- [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

Change to read:

- **ORGANIC IMPURITIES**

Solution A: [Water](#) and [phosphoric acid](#) (88:12)

Buffer: 3.5 g/L of [sodium 1-pentanesulfonate](#). Adjust with *Solution A* or 1 N [sodium hydroxide](#) to a pH of 3.0 ± 0.05 .

Mobile phase: [Acetonitrile](#) and *Buffer* (20:80)

System suitability stock solution: 0.1 mg/mL each of [USP Tizanidine Related Compound A RS](#), [USP Tizanidine Related Compound B RS](#), and [USP Tizanidine Related Compound C RS](#) in methanol

System suitability solution: 0.23 mg/mL of [USP Tizanidine Hydrochloride RS](#), and 0.01 mg/mL each of [USP Tizanidine Related Compound A RS](#), [USP Tizanidine Related Compound B RS](#), and [USP Tizanidine Related Compound C RS](#) from *System suitability stock solution* in *Mobile phase*

Standard solution: 0.046 mg/mL of [USP Tizanidine Hydrochloride RS](#) in *Mobile phase*

Sample solution: 1.14 mg/mL of Tizanidine Hydrochloride in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 230 nm

Column: 4.6-mm $\times$ 25-cm; packing [L1](#)

Column temperature: 50°

Flow rate: 1 mL/min

Injection volume: 10 μ L

$\blacktriangle$ **Run time:** NLT 11 times the retention time of tizanidine $\blacktriangle$ (USP 1-May-2021)

System suitability

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

[NOTE—See [Table 1](#) for the relative retention times.]

Suitability requirements

Resolution: NLT 4.0 between tizanidine and tizanidine related compound C; NLT 4.0 between tizanidine and tizanidine related compound B, *System suitability solution*

Column efficiency: NLT 5000 theoretical plates, *Standard solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 2.0%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Tizanidine Hydrochloride 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 area of each impurity from the *Sample solution*