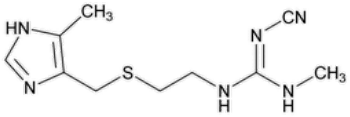
Status: Currently Official on 14-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-FBFCFE51-5752-4F68-8B7E-242574063F54_4_en-US
DOI: https://doi.org/10.31003/USPNF_M17730_04_01
DOI Ref: rvg35

Cimetidine Hydrochloride



• HCl

$C_{10}H_{16}N_6S \cdot HCl$ 288.80

Guanidine, *N*''-cyano-*N*-methyl-*N*'-[2-[[(5-methyl-1*H*-imidazol-4-yl)methyl]thio]ethyl]-, monohydrochloride;

2-Cyano-1-methyl-3-[2-[[(5-methylimidazol-4-yl)methyl]thio]ethyl]guanidine monohydrochloride CAS RN®: 70059-30-2; UNII: WF10491673.

DEFINITION

Cimetidine Hydrochloride contains NLT 98.0% and NMT 102.0% of cimetidine hydrochloride ($C_{10}H_{16}N_6S \cdot HCl$), calculated on the dried basis.

IDENTIFICATION

Change to read:

• **A.** ▲**Spectroscopic Identification Tests** ⟨197⟩, *Infrared Spectroscopy*: **197K**▲ (CN 1-May-2020)

Change to read:

• **B.** ▲**Spectroscopic Identification Tests** ⟨197⟩, *Ultraviolet-Visible Spectroscopy*: **197U**▲ (CN 1-May-2020)

Sample solution: 14 µg/mL

Medium: 0.1 N sulfuric acid

Acceptance criteria: Meets the requirements

ASSAY

• **Procedure**

Mobile phase: Transfer 200 mL of methanol and 0.3 mL of phosphoric acid to a 1000-mL volumetric flask, dilute with water to volume, and filter.

Standard stock solution: 0.5 mg/mL of USP Cimetidine Hydrochloride RS in a mixture of methanol and water (1:4)

Standard solution: 12.5 µg/mL of USP Cimetidine Hydrochloride RS in *Mobile phase* from *Standard stock solution*

Sample stock solution: 0.5 mg/mL of Cimetidine Hydrochloride in a mixture of methanol and water, prepared by initially dissolving the sample in water using 20% of the final volume, adding methanol using 20% of the final volume, and diluting that solution with water to volume

Sample solution: 12.5 µg/mL of Cimetidine Hydrochloride in *Mobile phase* from *Sample stock solution*

Chromatographic system

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

Mode: LC

Detector: UV 220 nm

Column: 3.9-mm × 30-cm; packing L1

Flow rate: 2 mL/min

Injection volume: 50 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Capacity factor, *k'*: NLT 0.6

Column efficiency: NLT 1000 theoretical plates

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of cimetidine hydrochloride ($C_{10}H_{16}N_6S \cdot HCl$) in the portion of Cimetidine 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 Cimetidine Hydrochloride in the *Standard solution* (mg/mL)

C_U = concentration of Cimetidine Hydrochloride 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**

Mobile phase: Transfer 940 mg of sodium 1-hexanesulfonate to a 1000-mL volumetric flask, add 240 mL of methanol followed by 0.3 mL of phosphoric acid, and dilute with water to volume. Filter before use.

Sample solution: 0.4 mg/mL of Cimetidine Hydrochloride in *Mobile phase*

Diluted sample solution: 0.8 µg/mL of Cimetidine Hydrochloride in *Mobile phase* from the the *Sample solution*

System suitability solution: Dissolve 50 mg of Cimetidine Hydrochloride in 10 mL of 1 N hydrochloric acid, heat on a steam bath for about 10 min (or boil on a hot plate for about 2 min), and allow to cool. Dilute a suitable volume of this solution with *Mobile phase* to obtain a solution containing 2 µg/mL. Use this solution within 24 h of its preparation. Adjusment of the heating step may be necessary to achieve a satisfactory amide analog peak response for the measurement of the resolution between the cimetidine and the amide analog peaks.

Chromatographic system

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

Mode: LC

Detector: UV 220 nm

Column: 4.6-mm × 25-cm; packing L1

Flow rate: 2 mL/min

Injection volume: 50 µL

System suitability

Samples: *System suitability solution* and *Diluted sample solution*

Suitability requirements

Resolution: NLT 4.0 between the cimetidine and the amide analog peaks, *System suitability solution*

Capacity factor, *k'*: NLT 3.0, *Diluted sample solution*

Column efficiency: NLT 2000 theoretical plates, *Diluted sample solution*

Relative standard deviation: NMT 7.0%, *Diluted sample solution*

Analysis

Samples: *Sample solution* and *Diluted sample solution*

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

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

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

r_S = peak response of cimetidine from the *Diluted sample solution*

D = dilution factor to prepare the *Diluted sample solution* from the *Sample solution*, 0.002

Acceptance criteria

Any individual impurity: NMT 0.2%

Total impurities: NMT 1.0%

SPECIFIC TESTS

- **Loss on Drying ⟨731⟩**

Analysis: Dry a sample at 105° for 2 h.

Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight, light-resistant containers.
- **USP Reference Standards** ⟨11⟩
  USP Cimetidine Hydrochloride RS

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

Topic/Question	Contact	Expert Committee
CIMETIDINE HYDROCHLORIDE	Documentary Standards Support	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. Information currently unavailable

Current DocID: GUID-FBFCFE51-5752-4F68-8B7E-242574063F54_4_en-US

DOI: https://doi.org/10.31003/USPNF_M17730_04_01

DOI ref: rvg35