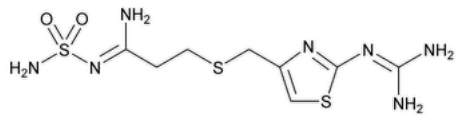


Status: Currently Official on 14-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-6FC322BB-4515-4A65-BFB2-6F3A020E1E75_4_en-US
DOI: https://doi.org/10.31003/USPNF_M32600_04_01
DOI Ref: 9i1u6

© 2025 USPC
Do not distribute

Famotidine



$C_8H_{15}N_7O_2S_3$ 337.45
Propanimidamide, N¹-(aminosulfonyl)-3-[[[2-[(diaminomethylene)amino]-4-thiazolyl]methyl]thio]-
[1-Amino-3-[[[2-[(diaminomethylene)amino]-4-thiazolyl]methyl]thio]propylidene]sulfamide;
3-[[2-(Diaminomethyleneamino)thiazol-4-yl]methylthio]-N¹-sulfamoylpropanimidamide CAS RN[®]: 76824-35-6; UNII: 5QZO15J2Z8.

DEFINITION
Famotidine contains NLT 98.5% and NMT 101.0% of famotidine ($C_8H_{15}N_7O_2S_3$), calculated on the dried basis.

IDENTIFICATION

Change to read:

- **A.** ▲ [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Infrared Spectroscopy](#) 197A, 197K, or 197M ▲ (CN 1-May-2020)

ASSAY

PROCEDURE

Sample: Dissolve 250 mg of Famotidine in 80 mL of glacial acetic acid.
Analysis: Titrate with 0.1 N perchloric acid VS (see [Titrimetry \(541\)](#)), using a suitable anhydrous electrode system. Perform a blank determination, and make any necessary correction. Each mL of 0.1 N perchloric acid is equivalent to 16.87 mg of $C_8H_{15}N_7O_2S_3$.
Acceptance criteria: 98.5%–101.0% on the dried basis

IMPURITIES

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

ORGANIC IMPURITIES

Buffer: 1.882 g/L of sodium 1-hexanesulfonate in water, adjusted with acetic acid to a pH of 3.5
Solution A: Acetonitrile, methanol, and *Buffer* (94:6:900)
Solution B: Acetonitrile
Mobile phase: See [Table 1](#). [NOTE—If necessary, adjust the *Mobile phase* to achieve a retention time of 19–23 min for the famotidine peak and a maximum of 48 min for the famotidine related compound E peak.]

Table 1

Time (min)	Solution A (%)	Solution B (%)	Flow Rate (mL/min)
0	100	0	1
23	96	4	1
27	96	4	2
47	78	22	2
48	100	0	2
54	100	0	1

Standard stock solution: 0.5 mg/mL of [USP Famotidine RS](#) in *Solution A*
Standard solution: 0.5 µg/mL of [USP Famotidine RS](#) in *Solution A*
System suitability stock solution: 0.25 mg/mL of [USP Famotidine Related Compound D RS](#) in methanol

System suitability solution: Transfer 1 mL of the *System suitability stock solution* and 0.5 mL of the *Standard stock solution* into a 100-mL volumetric flask, and dilute with *Solution A* to volume.

Sample solution: 0.5 mg/mL of Famotidine in *Solution A*

Identification solution: 0.5 mg/mL of [USP Famotidine RS](#) and 1.5 µg/mL of each of [USP Famotidine Related Compound B RS](#), [USP Famotidine Related Compound C RS](#), [USP Famotidine Related Compound D RS](#), [USP Famotidine Related Compound E RS](#), and [USP Famotidine Related Compound F RS](#) in *Solution A*

[NOTE—To address the poor solubility of [USP Famotidine Related Compound F RS](#) in *Solution A*, it may be first dissolved in a minimal amount of 0.1 N sodium hydroxide.]

Chromatographic system

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

Mode: LC

Detector: UV 265 nm

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

Column temperature: 50°

Flow rate: See [Table 1](#).

Injection volume: 20 µL

System suitability

Sample: *System suitability solution*

Suitability requirements

Resolution: NLT 3.5 between famotidine and famotidine related compound D

Analysis

Samples: *Standard solution*, *Sample solution*, and *Identification solution*

Chromatograph the *Identification solution*, and identify the components on the basis of their relative retention times, given in [Table 2](#).

Calculate the percentage of each impurity in the portion of Famotidine taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

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

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

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

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

F = relative response factor (see [Table 2](#))

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

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Famotidine	1.0	—	—
Famotidine related compound D ^a	1.1	1.0	0.3
Famotidine related compound C ^b	1.2	0.53	0.3
Famotidine cyanoamide ^c	1.4	0.71	0.2
Famotidine related compound F ^d	1.5	0.59	0.1
Famotidine amidine ^e	1.6	0.53	0.2
Famotidine related compound B ^f	2.0	0.40	0.3