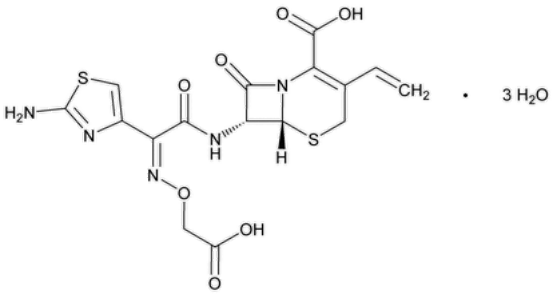
Status: Currently Official on 17-Feb-2025
Official Date: Official as of 01-May-2020
Document Type: USP Monographs
DocId: GUID-1C054B6A-5A40-47C3-850C-3B8C8ECC48EA_2_en-US
DOI: https://doi.org/10.31003/USPNF_M13990_02_01
DOI Ref: cj6ej

Cefixime



$C_{16}H_{15}N_5O_7S_2 \cdot 3H_2O$ 507.50
$C_{16}H_{15}N_5O_7S_2$ (anhydrous) 453.46

5-Thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 7-[[(2-amino-4-thiazolyl)[(carboxymethoxy)imino]acetyl]amino]-3-ethenyl-8-oxo-, trihydrate, [6*R*-[6α,7β(*Z*)]]-;

(6*R*,7*R*)-7-[2-(2-Amino-4-thiazolyl)glyoxylamido]-8-oxo-3-vinyl-5-thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 7^2-(*Z*)-[*O*-(carboxymethyl)oxime]trihydrate CAS RN®: 125110-14-7; UNII: 97I1C92E55.

Anhydrous CAS RN®: 79350-37-1; UNII: XZ7BG04GJX.

DEFINITION

Cefixime contains the equivalent of NLT 950 µg/mg and NMT 1030 µg/mg of cefixime ($C_{16}H_{15}N_5O_7S_2$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

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

Sample: Dissolve 5 mg by trituration in 2 mL of methanol, and evaporate with the aid of gentle heat to dryness.

Acceptance criteria: Meets the requirements

ASSAY

• **Procedure**

Solution A: 25 mL of 0.4 M tetrabutylammonium hydroxide solution diluted with water to 1000 mL, and adjusted with 1.5 M phosphoric acid to a pH of 6.5

Solution B: 13.6 g/L of monobasic potassium phosphate in water

Solution C: 14.2 g/L of anhydrous dibasic sodium phosphate in water

Buffer: Adjust an aliquot of *Solution C* with *Solution B* to a pH of 7.0.

Mobile phase: Acetonitrile and *Solution A* (1:3)

System suitability solution: 1 mg/mL of USP Cefixime RS in water. Heat this solution at 95° in an oil bath for 45 min, cool, and use promptly.

Standard solution: 0.2 mg/mL of cefixime from USP Cefixime RS in *Buffer*. Use this solution promptly.

Sample solution: 0.22 mg/mL of Cefixime in *Buffer*. Use this solution promptly.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm × 12.5-cm; 4-µm packing L1

Column temperature: 40°

Flow rate: Adjusted so that the retention time of cefixime is 10 min

Injection volume: 10 µL

System suitability

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

[Note—The relative retention times for cefixime (*E*)-isomer and cefixime are about 0.9 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 2.0 between cefixime and cefixime (*E*)-isomer, *System suitability solution*

Column efficiency: NLT 4000 theoretical plates, *Standard solution*

Calculate as follows:

$$\text{Result} = 5.545(t/W_{h/2})^2$$

t = retention time

$W_{h/2}$ = peak width at half height

Tailing factor: NLT 0.9 and NMT 2.0 for the analyte peak, *Standard solution*

Calculate as follows:

$$\text{Result} = W_{0.1}/2f$$

$W_{0.1}$ = width of peak of 10% height

f = distance from the peak maximum to the leading edge of the peak measured at 10% of the peak height

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the quantity, in µg/mg, of cefixime ($C_{16}H_{15}N_5O_7S_2$) in the portion of Cefixime taken:

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

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

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

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

P = potency of cefixime in USP Cefixime RS (mg/mg)

F = conversion factor, 1000 µg/mg

Acceptance criteria: 950–1030 µg/mg on the anhydrous basis

IMPURITIES

• **Organic Impurities**

Solution A, Solution B, Solution C, Buffer, Mobile phase, System suitability solution, Standard solution, Sample solution, Chromatographic system, and **System suitability:** Proceed as directed in the *Assay*.

Analysis

Samples: *Sample solution*

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

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

r_U = peak area for each impurity

r_S = cefixime peak area

P = potency of cefixime calculated in the *Assay* (µg/mg)

F = conversion factor, 0.001 mg/µg

Acceptance criteria

Individual impurities: NMT 1.0% of any individual impurity is found.

Total impurities: NMT 2.0%

SPECIFIC TESTS

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

Diluent: 20-mg/mL solution of sodium bicarbonate

Sample solution: 10 mg/mL in *Diluent*

Acceptance criteria: −75° to −88°

• **Crystallinity ⟨695⟩:** Meets the requirements

• **pH ⟨791⟩**

Sample solution: 0.7 mg/mL of cefixime

Acceptance criteria: 2.6–4.1

• **Water Determination, *Method I*⟨921⟩:** 9.0%–12.0%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers.

• **Labeling:** Label to indicate that it is the trihydrate form. Where the quantity of Cefixime is indicated in the labeling of any preparation containing Cefixime, this shall be understood to be in terms of anhydrous cefixime ($C_{16}H_{15}N_5O_7S_2$).

• **USP Reference Standards ⟨11⟩**
USP Cefixime RS

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

Topic/Question	Contact	Expert Committee
CEFIXIME	Documentary Standards Support	SM12020 Small Molecules 1
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM12020 Small Molecules 1

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. PF 44(1)

Current DocID: GUID-1C054B6A-5A40-47C3-850C-3B8C8ECC48EA_2_en-US
DOI: https://doi.org/10.31003/USPNF_M13990_02_01
DOI ref: cj6ej