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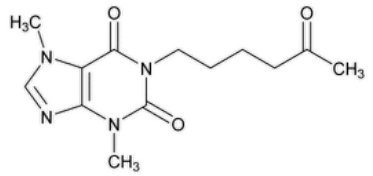
Pentoxifylline



$C_{13}H_{18}N_4O_3$ 278.31

1*H*-Purine-2,6-dione, 3,7-dihydro-3,7-dimethyl-1-(5-oxohexyl)-;

1-(5-Oxohexyl)theobromine CAS RN®: 6493-05-6.

DEFINITION

Pentoxifylline contains NLT 98.0% and NMT 102.0% of pentoxifylline ($C_{13}H_{18}N_4O_3$).

IDENTIFICATION

Change to read:

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

• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

• **Procedure**

Solution A: 1 g/L of perchloric acid

Mobile phase: Methanol, tetrahydrofuran, acetonitrile, and *Solution A* (2:2.5:15:80)

System suitability solution: 0.024 mg/mL of caffeine and 0.048 mg/mL of USP Pentoxifylline RS in *Mobile phase*

Standard solution: 0.05 mg/mL of USP Pentoxifylline RS in *Mobile phase*

Sample solution: 0.05 mg/mL of Pentoxifylline in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 273 nm

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

Flow rate: 0.7 mL/min

Injection volume: 10 µL

System suitability

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

Suitability requirements

Resolution: NLT 10.0 between caffeine and pentoxifylline, *System suitability solution*

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of pentoxifylline ($C_{13}H_{18}N_4O_3$) in the portion of Pentoxifylline 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 Pentoxifylline RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: 98.0%–102.0%

IMPURITIES

- **Residue on Ignition ⟨281⟩:** NMT 0.1%
- **Chloride and Sulfate, *Chloride*⟨221⟩**

Sample: 2.0 g

Acceptance criteria: The *Sample* shows no more chloride than corresponds to 0.31 mL of 0.020 N hydrochloric acid (0.011%).

- **Chloride and Sulfate, *Sulfate*⟨221⟩**

Sample: 1.0 g

Acceptance criteria: The *Sample* shows no more sulfate than corresponds to 0.20 mL of 0.020 N sulfuric acid (0.02%).

- **Organic Impurities**

Solution A and **Mobile phase:** Prepare as directed in the *Assay*.

System suitability solution: 0.7 µg/mL of caffeine and 350 µg/mL of USP Pentoxifylline RS in *Mobile phase*

Standard solution: 0.7 µg/mL of USP Pentoxifylline RS in *Mobile phase*

Sample solution: 350 µg/mL of Pentoxifylline in *Mobile phase*

Chromatographic system: Proceed as directed in the *Assay* except for the following:

Injection volume: 20 µL

Run time: NLT 5 times the retention time for pentoxifylline

System suitability

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

Suitability requirements

Resolution: NLT 10.0 between caffeine and pentoxifylline, *System suitability solution*

Relative standard deviation: NMT 5.0%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Measure the areas of all the peaks in the *Sample solution*, except for that of pentoxifylline.

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

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

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

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

C_S = concentration of USP Pentoxifylline RS in the *Standard solution* (µg/mL)

C_U = concentration of Pentoxifylline in the *Sample solution* (µg/mL)

Acceptance criteria

Individual impurities: NMT 0.2%

Total impurities: NMT 0.5%

SPECIFIC TESTS

- **Completeness of Solution ⟨641⟩**

Sample solution: 1 g in 50 mL of carbon dioxide-free water

Acceptance criteria: Meets the requirements

- **Acidity**

Sample solution: 1 g in 50 mL of carbon dioxide-free water

Analysis: To the *Sample solution* add 1 drop of bromothymol blue TS.

Acceptance criteria: NMT 0.2 mL of 0.01 N sodium hydroxide is required to produce a color change.

- **Loss on Drying ⟨731⟩**

Analysis: Dry under vacuum at 60° for 3 h.

Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in well-closed containers.
- **USP Reference Standards** ⟨11⟩

  USP Pentoxifylline RS

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

Topic/Question	Contact	Expert Committee
PENTOXIFYLLINE	Documentary Standards Support	SM22020 Small Molecules 2
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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