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Ketoprofen Capsules

DEFINITION

Ketoprofen Capsules contain NLT 90.0% and NMT 110.0% of the labeled amount of ketoprofen ($C_{16}H_{14}O_3$).

IDENTIFICATION

Change to read:

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

Sample solution: Shake a quantity of the contents of the Capsules containing 50 mg of ketoprofen with 5 mL of chloroform for 5 min, filter, and evaporate to dryness using a rotary evaporator.

Acceptance criteria: Meet the requirements

• **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**

The *Standard solution* and *Sample solution* must be protected from light.

Mobile phase: Acetonitrile, glacial acetic acid, and water (90:1:110)

System suitability stock solution: 0.25 mg/mL of USP Ketoprofen RS and 0.5 mg/mL of USP Ketoprofen Related Compound A RS in *Mobile phase*

System suitability solution: 0.02 mg/mL of USP Ketoprofen RS and 0.04 mg/mL of USP Ketoprofen Related Compound A RS in *Mobile phase* from *System suitability stock solution*

Standard stock solution: 0.24 mg/mL of USP Ketoprofen RS in *Mobile phase*

Standard solution: 0.024 mg/mL of USP Ketoprofen RS in *Mobile phase* from *Standard stock solution*

Sample solution: Nominally 0.024 mg/mL of ketoprofen in *Mobile phase* prepared as follows. Remove completely the contents of NLT 20 Capsules, and transfer a quantity of the contents, equivalent to 200 mg of ketoprofen, to a 250-mL volumetric flask. Add 150 mL of *Mobile phase*, stir for 2 h, then dilute with *Mobile phase* to volume. Centrifuge a portion of the preparation. Pipet 3.0 mL of clear supernatant into a 100-mL volumetric flask. Dilute with *Mobile phase* to volume.

Chromatographic system

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

Mode: LC

Detector: UV 250 nm

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

Flow rate: 1.2 mL/min

Injection volume: 20 µL

System suitability

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

Suitability requirements

Resolution: NLT 3.0 between ketoprofen and ketoprofen related compound A, *System suitability solution*

Tailing factor: NMT 1.5 for the ketoprofen peak, *System suitability solution*

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of ketoprofen ($C_{16}H_{14}O_3$) in the portion of Capsules 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 Ketoprofen RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

• **Dissolution ⟨711⟩**

The *Standard solution* and *Sample solution* must be protected from light.

Medium: 0.05 M phosphate buffer, pH 7.4; 1000 mL

Apparatus 2: 50 rpm

Time: 30 min

Standard solution: USP Ketoprofen RS in *Medium*

Sample solution: Pass a portion of the solution under test through a suitable filter. Dilute with *Medium*, if necessary, to a concentration similar to that of the *Standard solution*.

Instrumental conditions

(See *Ultraviolet-Visible Spectroscopy ⟨857⟩*.)

Mode: UV

Analytical wavelength: 260 nm

Cell path length: 1 cm

Blank: *Medium*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of ketoprofen ($C_{16}H_{14}O_3$) dissolved:

$$\text{Result} = (A_U/A_S) \times (C_S/L) \times D \times V \times 100$$

A_U = absorbance from the *Sample solution*

A_S = absorbance from the *Standard solution*

C_S = concentration of the *Standard solution* (mg/mL)

L = label claim (mg/Capsule)

D = dilution factor of the *Sample solution*

V = volume of *Medium*, 1000 mL

Tolerances: NLT 80% (Q) of the labeled amount of ketoprofen ($C_{16}H_{14}O_3$) is dissolved.

IMPURITIES

• **Organic Impurities**

The *System suitability solution*, *Standard solution*, and *Sample solution* must be protected from light.

Buffer: 68.0 g/L of monobasic potassium phosphate in water. Adjust with phosphoric acid to a pH of 3.5 ± 0.05.

Mobile phase: Acetonitrile, water, and *Buffer* (43:55:2)

Diluent: Acetonitrile and water (2:3)

System suitability solution: 5 µg/mL of USP Ketoprofen RS and 1.5 µg/mL of USP Ketoprofen Related Compound D RS in *Diluent*

Standard solution: 2 µg/mL of USP Ketoprofen RS, 2 µg/mL of USP Ketoprofen Related Compound C RS, and 3 µg/mL of USP Ketoprofen Related Compound D RS in *Diluent*

Sample solution: Nominally 1 mg/mL of ketoprofen in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 233 nm

Column: 4.6-mm × 15-cm; 5-µm packing L1

Flow rate: 1 mL/min

Injection volume: 20 µL

Run time: 7 times the retention time of ketoprofen

System suitability

Sample: *System suitability solution*

Suitability requirements

Resolution: NLT 7.0 between ketoprofen related compound D and ketoprofen

Relative standard deviation: NMT 10% for the ketoprofen peak

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Capsules 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 the corresponding related compound from the *Standard solution*

C_S = concentration of the corresponding USP Ketoprofen Related Compound RS in the *Standard solution* (mg/mL); use the concentration of the USP Ketoprofen RS for unknown impurities

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

Acceptance criteria: See *Table 1*.

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Ketoprofen related compound C[a]	0.3	0.2
Ketoprofen	1.0	—
Ketoprofen related compound D[b]	1.5	0.3
Individual unspecified impurity	—	0.2
Total impurities	—	0.5

[a] 2-(3-Carboxyphenyl) propionic acid.

[b] 3-Acetylbenzophenone.

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers, and store at controlled room temperature.
- **USP Reference Standards** ⟨11⟩

USP Ketoprofen RS
(±)-*m*-Benzoylhydratropic acid.
$C_{16}H_{14}O_3$ 254.28

USP Ketoprofen Related Compound A RS
α-Methyl-3-(4-methylbenzoyl) benzeneacetic acid.
$C_{17}H_{16}O_3$ 268.31

USP Ketoprofen Related Compound C RS
2-(3-Carboxyphenyl) propionic acid.
$C_{10}H_{10}O_4$ 194.18

USP Ketoprofen Related Compound D RS
3-Acetylbenzophenone.
$C_{15}H_{12}O_2$ 224.25

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

Topic/Question	Contact	Expert Committee
KETOPROFEN CAPSULES	Documentary Standards Support	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

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