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Ursodiol Tablets

DEFINITION
Ursodiol Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of ursodiol ($C_{24}H_{40}O_4$).

IDENTIFICATION

• **Thin-Layer Chromatography**

Standard solution: 1 mg/mL of USP Ursodiol RS in methanol

Sample solution: Transfer a quantity of finely powdered Tablets, equivalent to about 25 mg of ursodiol, to a conical flask. Add 25.0 mL of methanol, and mix for 20 min. Centrifuge this solution for 10 min at 4000 rpm, and use the clear supernatant.

Chromatographic system

(See *Chromatography ⟨621⟩, Thin-Layer Chromatography*.)

Mode: TLC

Adsorbent: 0.25-mm layer of chromatographic silica gel mixture activated for at least 4 h at 105°

Application volume: 25 µL

Developing solvent system: Chloroform, acetone, and acetic acid (7:2:1)

Spray reagent: Dissolve 2.5 g of phosphomolybdic acid in 50 mL of glacial acetic acid. Add 2.5 mL of concentrated sulfuric acid, and mix well.

Analysis: Proceed as directed for *Chromatography ⟨621⟩, Thin-Layer Chromatography*. Allow the chromatogram to develop until the solvent front has moved about three-fourths of the length of the plate. Spray the plate lightly with *Spray reagent*. Dry the plate by heating at 105° for about 7 min.

Acceptance criteria: The principal indigo-colored spot of the *Sample solution* corresponds in color and in R_F value to that of the *Standard solution*.

ASSAY

• **Procedure**

Mobile phase: Methanol, water, and phosphoric acid (77:23:0.6)

Internal standard solution: 3.75 mg/mL of propylparaben in *Mobile phase*

Standard solution: 3.75 mg/mL of USP Ursodiol RS in *Internal standard solution*

Sample solution: Weigh and finely powder 20 Tablets. Transfer an accurately weighed portion of the powder, equivalent to about 37.5 mg of ursodiol, to a glass-stoppered conical flask. Add 10.0 mL of *Internal standard solution*, and shake by mechanical means for 15 min. Sonicate at 40° for an additional 15 min, and filter.

Chromatographic system

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

Mode: LC

Detector: Differential refractive index

Detector temperature: 40°

Column: 4.6-mm × 25-cm; packing L7

Flow rate: 1 mL/min

Injection size: 10 µL

System suitability

Sample: *Standard solution*

[Note—The relative retention times for propylparaben and ursodiol are 0.73 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 3.0 between ursodiol and propylparaben

Column efficiency: NLT 1600 theoretical plates

Tailing factor: NMT 2.0

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of $C_{24}H_{40}O_4$ in the portion of Tablets taken:

$$\text{Result} = (R_U/R_S) \times (C_S/C_U) \times 100$$

R_U = ratio of peak responses from the *Sample solution*

R_S = ratio of peak responses from the *Standard solution*

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

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

• **Dissolution ⟨711⟩**

Medium: Simulated intestinal fluid TS, prepared without pancreatin and adjusted with 0.1 N sodium hydroxide or 0.1 N hydrochloric acid to a pH of 8.0; 900 mL

Apparatus 2: 75 rpm

Time: 45 min

Mobile phase: Methanol, water, and phosphoric acid (77:23:0.6)

Sample solution: Pass a portion of the solution under test through a suitable filter.

Standard solution: USP Ursodiol RS in *Medium*

Chromatographic system

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

Mode: LC

Detector: Differential refractive index

Detector temperature: 40°

Column: 4.6-mm × 25-cm; packing L7

Flow rate: 1 mL/min

Injection size: 25 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Column efficiency: NLT 1600 theoretical plates

Tailing factor: NMT 2.0

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Tolerances: NLT 80% (Q) of the labeled amount of $C_{24}H_{40}O_4$ is dissolved.

• **Uniformity of Dosage Units ⟨905⟩:** Meet the requirements

IMPURITIES

Organic Impurities

• **Procedure**

Standard solution A: 20 µg/mL of USP Ursodiol RS in methanol

Standard solution B: 10 µg/mL of lithocholic acid in methanol

Standard solution C: 300 µg/mL of chenodeoxycholic acid in methanol

Sample solution: Transfer a quantity of finely powdered Tablets, equivalent to about 250 mg of ursodiol, to a conical flask. Add 25.0 mL of methanol, and mix for 20 min. Centrifuge this solution for 10 min at 4000 rpm, and use the clear supernatant.

Chromatographic system

(See *Chromatography ⟨621⟩, Thin-Layer Chromatography*.)

Mode: TLC

Adsorbent: 0.25-mm layer of chromatographic silica gel mixture, activated for at least 4 h at 105°

Application volume: 25 µL of *Standard solutions A*, *B*, and *C*; 50 µL of the *Sample solution*

Developing solvent system: Chloroform, acetone, and acetic acid (7:2:1)

Spray reagent: Dissolve 2.5 g of phosphomolybdic acid in 50 mL of glacial acetic acid. Add 2.5 mL of concentrated sulfuric acid, and mix well.

Analysis: Proceed as directed for *Chromatography ⟨621⟩, Thin-Layer Chromatography*. Spray the plate lightly with *Spray reagent*. Dry the plate by heating at 105° for about 7 min.

Acceptance criteria: The spot due to lithocholic acid from the *Sample solution*, if present, is not greater in size and intensity than that from *Standard solution B* (0.05%). The spot due to chenodeoxycholic acid from the *Sample solution*, if present, is not greater in size and intensity than that from *Standard solution C* (1.5%). No other unidentified spot in the *Sample solution* is greater in size and intensity than the spot from *Standard solution A* (0.1%).

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in well-closed containers, and store at a temperature between 20° and 25°.
- **USP Reference Standards ⟨11⟩**
  USP Ursodiol RS

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

Topic/Question	Contact	Expert Committee
URSODIOL TABLETS	Documentary Standards Support	SM32020 Small Molecules 3
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM32020 Small Molecules 3

Chromatographic Database Information: Chromatographic Database

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