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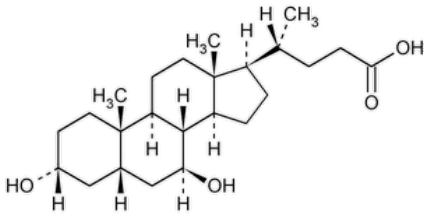
Ursodiol



$C_{24}H_{40}O_4$ 392.57

Cholan-24-oic acid, 3,7-dihydroxy-, (3α,5β,7β)-.

3α,7β-Dihydroxy-5β-cholan-24-oic acid CAS RN®: 128-13-2; UNII: 724L30Y2QR.

» Ursodiol contains not less than 98.5 percent and not more than 101.5 percent of $C_{24}H_{40}O_4$, calculated on the dried basis.

Packaging and storage—Preserve in tight containers.

USP Reference standards ⟨11⟩—
USP Ursodiol RS

Change to read:

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

Melting range ⟨741⟩**:** between 200° and 205°.

Specific rotation ⟨781S⟩**:** between 57° and 62°.

Test solution: 20 mg per mL, in alcohol.

Loss on drying ⟨731⟩—Dry it at 105° for 3 hours: it loses not more than 0.5% of its weight.

Residue on ignition ⟨281⟩**:** not more than 0.1%.

Related compounds—

Adsorbent: 0.25-mm layer of chromatographic silica gel.

Solvent—Prepare a mixture of acetone and water (9:1).

Standard solution 1—Prepare a solution of chenodiol in *Solvent* containing 600 µg per mL.

Standard solution 2—Prepare a solution of lithocholic acid in *Solvent* containing 20 µg per mL.

Test solution—Prepare a solution of Ursodiol in *Solvent* containing 40 mg per mL.

Diluted test solution—Quantitatively dilute 1 mL of the *Test solution* with *Solvent* to obtain a solution having a concentration of 40 µg per mL.

Developing solvent system: a mixture of chloroform, glacial acetic acid, and water (85:15:0.5)

Spray reagent: phosphomolybdic acid TS.

Procedure—Separately apply 10 µL each of *Standard solution 1, Standard solution 2,* the *Test solution,* and the *Diluted test solution* to a thin-layer chromatographic plate (see *Thin Layer Chromatography* under *Chromatography* ⟨621⟩), and proceed as directed in the chapter, allowing the solvent front to move about three-fourths of the length of the plate. Remove the plate from the developing chamber, mark the solvent front, and air-dry the plate. Spray the plate with phosphomolybdic acid TS, dry at 105° for 5 minutes, and examine the plate: any secondary spot in the chromatogram of the *Test solution* having the same R_F value as the principal spot from *Standard solution 1* is not greater in size or intensity than that obtained from *Standard solution 1:* not more than 1.5% of chenodiol is found. No secondary spot observed in the chromatogram of the *Test solution* having the same R_F value as the principal spot from *Standard solution 2* is greater in size or intensity than that obtained from *Standard solution 2:* not more than 0.05% of lithocholic acid is found. No other secondary spot observed in the chromatogram of the *Test solution* is greater in size or intensity than the principal spot obtained from the *Diluted test solution:* not more than 0.1% of any other impurity is found.

Assay—

Mobile phase—Prepare a filtered and degassed mixture of acetonitrile and water (55:45). Adjust with 0.6 M phosphoric acid to a pH of 3.0. Make adjustments if necessary (see *System Suitability* under *Chromatography ⟨621⟩*).

Internal standard solution—Dissolve an accurately weighed quantity of epiandrosterone in methanol to obtain a solution having a concentration of about 4 mg per mL. Dilute a portion of this solution quantitatively with *Mobile phase* to obtain a solution having a concentration of about 0.8 mg per mL.

Standard preparation—Dissolve an accurately weighed quantity of USP Ursodiol RS in methanol, and dilute quantitatively, and stepwise if necessary, with methanol to obtain a solution having a known concentration of about 4 mg per mL. Transfer this solution to a suitable container, and dilute with *Mobile phase* to give a solution having a known concentration of about 0.8 mg of ursodiol per mL. Transfer equal volumes of this solution and the *Internal standard solution* to a suitable container, and mix.

Assay preparation—Transfer about 100 mg of Ursodiol, accurately weighed, to a 25-mL volumetric flask, dissolve in and dilute with methanol to volume. Transfer 5.0 mL of this solution to a 25-mL volumetric flask, dilute with *Mobile phase* to volume, and mix. Transfer equal volumes of this solution and the *Internal standard solution* to a suitable container, and mix.

Chromatographic system (see *Chromatography ⟨621⟩*)—The liquid chromatograph is equipped with a differential refractive index detector and a 3.9-mm × 30-cm column that contains packing L1. The flow rate is about 1.0 mL per minute. Both the detector temperature and the column temperature are maintained at 40°. Chromatograph the *Standard preparation,* and record the peak responses as directed for *Procedure:* the relative retention times are about 0.74 for ursodiol and 1.0 for epiandrosterone; the resolution, *R,* between ursodiol and epiandrosterone is not less than 3.8 (If the resolution specification is not met, increase the water content of the *Mobile phase*); and the relative standard deviation for replicate injections is not more than 1.0%.

Procedure—Separately inject equal volumes (about 50 µL) of the *Standard preparation* and the *Assay preparation* into the chromatograph, record the chromatograms, and measure the responses for the major peaks. Calculate the quantity, in mg, of $C_{24}H_{40}O_4$ in the portion of Ursodiol taken by the formula:

$$250C(R_U/R_S)$$

in which C is the concentration, in mg per mL, of USP Ursodiol RS in the *Standard preparation;* and R_U and R_S are the ratios of the ursodiol peak to the internal standard peak obtained from the *Assay preparation* and the *Standard preparation,* respectively.

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

Topic/Question	Contact	Expert Committee
URSODIOL	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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