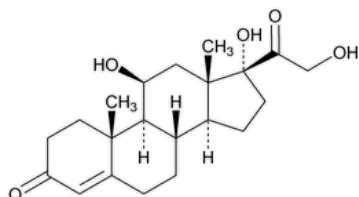


Status: Currently Official on 15-Feb-2025
 Official Date: Official as of 01-May-2020
 Document Type: USP Monographs
 DocId: GUID-2D3715B7-4F3C-4237-AE9A-B82F19DFCA29_2_en-US
 DOI: https://doi.org/10.31003/USPNF_M38090_02_01
 DOI Ref: zkw6y

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Hydrocortisone



$C_{21}H_{30}O_5$ 362.46

Pregn-4-ene-3,20-dione, 11,17,21-trihydroxy-, (11 β)-;

Cortisol CAS RN[®]: 50-23-7; UNII: WI4X0X7BPJ.

DEFINITION

Hydrocortisone contains NLT 97.0% and NMT 102.0% of $C_{21}H_{30}O_5$, calculated on the dried basis.

IDENTIFICATION

Change to read:

- **A.** ▲ [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Infrared Spectroscopy: 197M](#) ▲ (CN 1-MAY-2020)

Change to read:

- **B.** ▲ [SPECTROSCOPIC IDENTIFICATION TESTS \(197\)](#), [Ultraviolet-Visible Spectroscopy: 197U](#) ▲ (CN 1-MAY-2020)

Analytical wavelength: 242 nm

Sample solution: 10 μ g/mL in methanol

Acceptance criteria: Absorptivities, calculated on the dried basis, do not differ by more than 2.5%.

ASSAY

• PROCEDURE

Mobile phase: Acetonitrile, methanol, and water (25:25:50)

Diluent: Methanol and water (1:1)

Internal standard solution: 1 mg/mL of propylparaben in methanol

Standard stock solution: 1 mg/mL of [USP Hydrocortisone RS](#) in methanol

Standard solution: 2.0 mL of *Standard stock solution* and 2.0 mL of *Internal standard solution*. Dilute with *Diluent* to 50 mL.

Sample stock solution: 1 mg/mL of Hydrocortisone in methanol

Sample solution: 2.0 mL of *Sample stock solution* and 2.0 mL of *Internal standard solution*. Dilute with *Diluent* to 50 mL.

Chromatographic system

(See [Chromatography \(621\)](#), [System Suitability](#).)

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm $\times$ 15-cm; 5- μ m packing L1

Flow rate: 1 mL/min

Injection size: 10 μ L

System suitability

Sample: *Standard solution*

[NOTE—The relative retention times for hydrocortisone and propylparaben are about 1.0 and 1.8, respectively.]

Suitability requirements

Resolution: NLT 9.0 between the hydrocortisone and propylparaben peaks

Column efficiency: NLT 3000 theoretical plates for hydrocortisone

Tailing factor: NMT 1.2

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of hydrocortisone ($C_{21}H_{30}O_5$) in the portion of Hydrocortisone taken:

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

R_U = peak response ratio of hydrocortisone to the internal standard from the *Sample solution*

R_S = peak response ratio of hydrocortisone to the internal standard from the *Standard solution*

C_S = concentration of [USP Hydrocortisone RS](#) in the *Standard solution* (mg/mL)

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

Acceptance criteria: 97.0%–102.0% on the dried basis

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#)

Sample: 100 mg

Acceptance criteria: NMT 0.5%

• ORGANIC IMPURITIES

Mobile phase: Butyl chloride, tetrahydrofuran, methanol, glacial acetic acid, and water (890:56:28:24:0.4)

Diluent: Butyl chloride, tetrahydrofuran, methanol, and glacial acetic acid (81.5:10:8:0.5)

Standard solution: 40 µg/mL of [USP Hydrocortisone RS](#) in *Diluent*. [NOTE—Sonicate for 5 min.]

Sample solution: 2 mg/mL of Hydrocortisone in *Diluent*. [NOTE—Sonicate for 5 min.]

Chromatographic system

(See [Chromatography \(621\)](#), [System Suitability](#).)

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm × 15-cm; 3-µm packing L3

Flow rate: 1.5 mL/min

Injection size: 5 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 5%

Analysis

Samples: *Standard solution*, *Sample solution*, and *Diluent*. [NOTE—Ignore artifact peaks.]

Calculate the percentage of impurities in the portion of Hydrocortisone taken:

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

r_U = individual impurity peak area from the *Sample solution*

r_S = peak area from the *Standard solution*

C_S = concentration of [USP Hydrocortisone RS](#) in the *Standard solution* (mg/mL)

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

Acceptance criteria

Individual impurities: NMT 0.5%

Total impurities: NMT 2.0%

SPECIFIC TESTS

• [OPTICAL ROTATION, Specific Rotation \(781S\)](#)

Sample solution: 10 mg/mL, in dioxane