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Clioquinol and Hydrocortisone Ointment

DEFINITION

Clioquinol and Hydrocortisone Ointment contains NLT 90.0% and NMT 110.0% of the labeled amounts of clioquinol (C_9H_5ClINO) and hydrocortisone ($C_{21}H_{30}O_5$) in a suitable ointment base.

IDENTIFICATION

• **A.** The retention time of the clioquinol peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay* for *Clioquinol*.

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

ASSAY

• **Clioquinol**

Internal standard solution: 2 mg/mL of pyrene in pyridine

Standard stock solution: 3 mg/mL of USP Clioquinol RS in a mixture of pyridine and *n*-hexane (4:1)

Standard solution: Transfer 1.0 mL of the *Standard stock solution*, 1.0 mL of *N,O*-bis(trimethylsilyl)acetamide, and 1.0 mL of *Internal standard solution* to a suitable screw-capped glass vial fitted with a polytef-lined septum, and mix. Heat on a water bath at 50° for 15 min, and cool to room temperature.

Sample solution: Transfer nominally 150 mg of clioquinol from Ointment to a 125-mL separator. Add 75 mL of *n*-hexane, insert the stopper in the separator, and mix until the specimen is completely dispersed. Extract with 25 mL of dimethylformamide, collecting the extract in a 50-mL volumetric flask. Repeat the extraction with two 10-mL portions of dimethylformamide, collecting the extracts in the 50-mL volumetric flask, and dilute with dimethylformamide to volume. Transfer 1.0 mL of this solution to a suitable size screw-capped vial, and evaporate the solution with the aid of nitrogen at 60° to dryness. Dissolve the residue in 1.0 mL of a mixture of pyridine and hexane (4:1), and pipet 1.0 mL of *N,O*-bis(trimethylsilyl)acetamide and 1.0 mL of *Internal standard solution* into the glass vial, fitted with a polytef-lined septum, and securely close. Heat the vial on a water bath at 50° for 15 min, and cool to room temperature.

Chromatographic system

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

Mode: GC

Detector: Flame ionization

Column: 2-mm × 1.8-m; packed with 3% liquid phase G3 on 80- to 100-mesh support S1AB

Temperatures

Column: 165°

Injection port: 170°

Detector: 250°

Carrier gas: Dry helium

Flow rate: 30 mL/min

Injection volume: 1 µL

System suitability

Sample: *Standard solution*

[Note—The relative retention times for clioquinol and pyrene are 0.6 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 3.0 between the analyte and internal standard peaks

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Record the chromatograms to obtain NLT 40% of maximum recorder response, and measure the peak response of each component.

Calculate the percentage of the labeled amount of clioquinol (C_9H_5ClINO) taken:

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

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

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

C_S = concentration of USP Clioquinol RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: 90.0%–110.0%

- **Hydrocortisone**

Mobile phase: Acetonitrile, methanol, and water (1:1:2.75)

Standard stock solution: 1 mg/mL of USP Hydrocortisone RS in alcohol

Standard solution: *Standard stock solution* and alcohol (1:9)

Sample solution: Transfer nominally 10 mg of hydrocortisone from Ointment to a 50-mL centrifuge tube. Add 30 mL of alcohol, and heat on a steam bath just to boiling. Shake for 15 min, and centrifuge. Transfer the supernatant extract to a 100-mL volumetric flask. Repeat the extraction with two 20-mL portions of alcohol, combining the extracts in the 100-mL volumetric flask. Add alcohol to volume, mix, and filter.

System suitability stock solution: 0.5 mg/mL of methylparaben in alcohol

System suitability solution: Transfer 2 mL of *System suitability stock solution* and 20 mL of *Standard stock solution* into a 200-mL volumetric flask, and dilute with alcohol to volume.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Columns

Guard: Packing L2

Analytical: 3.9-mm × 30-cm; packing L1

Flow rate: 1 mL/min

Injection volume: 10 µL

System suitability

Sample: *System suitability solution*

[Note—The relative retention times for methylparaben and hydrocortisone are 0.6 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 2.0 between the hydrocortisone and methylparaben peaks

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of hydrocortisone ($C_{21}H_{30}O_5$) 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 Hydrocortisone RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

- **Minimum Fill ⟨755⟩:** Meets the requirements

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in collapsible tubes or in tight, light-resistant containers.
- **USP Reference Standards ⟨11⟩**

USP Clioquinol RS
USP Hydrocortisone RS

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

Topic/Question	Contact	Expert Committee
CLIOQUINOL AND HYDROCORTISONE OINTMENT	Documentary Standards Support	SM12020 Small Molecules 1

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. Information currently unavailable

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