Dissolution ⟨711⟩**—**

Medium: 0.01 N hydrochloric acid; 900 mL.

Apparatus 1: 100 rpm.

Time: 45 minutes.

Procedure—Determine the amount of $C_{21}H_{27}FO_6$ dissolved by employing UV absorption at the wavelength of maximum absorbance at about 238 nm on filtered portions of the solution under test, suitably diluted with *Dissolution Medium*, in comparison with a Standard solution having a known concentration of USP Triamcinolone RS in the same *Medium.*

Tolerances—Not less than 75% *(Q)* of the labeled amount of $C_{21}H_{27}FO_6$ is dissolved in 45 minutes.

Uniformity of dosage units ⟨905⟩: meet the requirements.

Assay—

Mobile phase, *Internal standard solution*, *Standard preparation,* and *Chromatographic system*—Prepare as directed in the *Assay* under *Triamcinolone.*

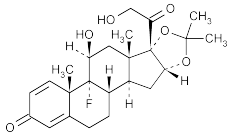
Assay preparation—Weigh and finely powder not less than 20 Tablets. Transfer an accurately weighed portion of the powder, equivalent to about 10 mg of triamcinolone, to a suitable container. Add 50.0 mL of *Internal standard solution,* and shake vigorously by mechanical means for 10 minutes. Centrifuge for 10 minutes or until a clear supernatant is obtained.

Procedure—Proceed as directed for *Procedure* in the *Assay* under *Triamcinolone*. The relative retention times are about 1.0 for triamcinolone and 1.9 for hydrocortisone. Calculate the quantity, in mg, of $C_{21}H_{27}FO_6$ in the portion of Tablets taken by the formula:

$$50C(R_U / R_S)$$

in which the terms are as defined therein.

Triamcinolone Acetonide



$C_{24}H_{31}FO_6$ 434.50

Pregna-1,4-diene-3,20-dione, 9-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]-, (11*β*,16*α*)-.

9-Fluoro-11*β*,16*α*,17,21-tetrahydroxypregna-1,4-diene-3,20-dione cyclic 16,17-acetal with acetone [76-25-5].

» Triamcinolone Acetonide contains not less than 97.0 percent and not more than 102.0 percent of $C_{24}H_{31}FO_6$, calculated on the dried basis.

Packaging and storage—Preserve in well-closed containers. Store at 25°, excursions permitted between 15° and 30°.

USP Reference standards ⟨11⟩**—**

USP Fluoxymesterone RS

USP Triamcinolone Acetonide RS

Identification—

A: *Infrared Absorption* ⟨197K⟩: recrystallized from methanol.

B: *Ultraviolet Absorption* ⟨197U⟩—

Solution: 20 µg per mL.

Medium: methanol.

Specific rotation ⟨781S⟩**:** between +118° and +130°.

Test solution: 5 mg per mL, in dimethylformamide.

Loss on drying ⟨731⟩**—**Dry it in vacuum at 60° for 4 hours: it loses not more than 1.5% of its weight.

Delete the following:

•**Heavy metals—**Carefully ignite 1.0 g in a muffle furnace at about 550° until thoroughly charred. Cool, add to the contents of the crucible 5 drops of sulfuric acid and 2 mL of nitric acid, cautiously heat until reaction has ceased, then ignite in a muffle furnace at 500° to 600° until the carbon is entirely burned off. Cool, add 2 mL of hydrochloric acid, and slowly evaporate on a steam bath to dryness. Moisten the residue with 1 drop of hydrochloric acid and 5 mL of hot water, and digest for 2 minutes. Add 1 drop of phenolphthalein TS, then add 6 N ammonium hydroxide dropwise until the reaction is alkaline. Render the solution acid with 1 N acetic acid, then add 1 mL of excess, transfer to a beaker, and add water to make 10 mL. Pipet 2.5 mL (equivalent to 25 µg of lead) of *Standard Lead Solution* (see *Lead* ⟨231⟩) into a second beaker, add 3 mL of water and 1 drop of phenolphthalein TS, render just alkaline with 6 N ammonium hydroxide, then render acid with 1 N acetic acid, and add 1 mL in excess. Dilute with water to 10 mL. To each beaker add 5 mL of freshly prepared hydrogen sulfide TS, mix, and allow to stand for 5 minutes. Pass each solution through a separate, acid-resistant, white, plain membrane filter of 0.22-µm pore size and 25 mm in diameter, collecting the precipitates on the filter disks: the color of the precipitate from the solution under test is not darker than that from the control. The heavy metals limit is 0.0025%.• (Official 1-Jan-2018)

Chromatographic purity—

Mobile phase—Prepare a filtered and degassed mixture of water and acetonitrile (17:8). Make adjustments if necessary (see *System Suitability* under *Chromatography* ⟨621⟩).

Test solution—Transfer about 25 mg of Triamcinolone Acetonide, accurately weighed, to a 50-mL volumetric flask; dissolve in 25 mL of methanol, shake vigorously to aid dissolution; dilute with *Mobile phase* to volume; and mix.

Chromatographic system (see *Chromatography* ⟨621⟩)—The liquid chromatograph is equipped with a 254-nm detector and a 3.9-mm × 30-cm column that contains packing L1. The flow rate is about 1.5 mL per minute. Chromatograph the *Test solution,* and record the peak responses as directed for *Procedure:* the resolution, *R,* between triamcinolone acetonide and any impurity peak is not less than 1.0.

Procedure—Inject about 20 µL of the *Test solution* into the chromatograph, record the chromatogram for not less than four times the retention time of triamcinolone acetonide, and measure all of the peak responses. Calculate the percentage of each impurity in the portion of Triamcinolone Acetonide taken by the formula:

$$100(r_i / r_s)$$

in which r_i is the peak response for each impurity; and r_s is the sum of the responses of all the peaks: not more than 0.3% of any individual impurity is found, and not more than 0.8% of total impurities is found.

Assay—

Mobile phase—Prepare a solution of acetonitrile in water containing approximately 30% (v/v) of acetonitrile.

Internal standard solution—Dissolve USP Fluoxymesterone RS in methanol to obtain a solution having a concentration of about 50 µg per mL.

Standard preparation—Dissolve an accurately weighed quantity of USP Triamcinolone Acetonide RS in *Internal standard solution* to obtain a solution having a known concentration of about 75 µg per mL. Mix an accurately measured volume of the resulting solution with an equal volume of *Mobile phase* to obtain a *Standard preparation* containing about 37.5 µg of USP Triamcinolone Acetonide RS per mL.

Assay preparation—Using about 37 mg of Triamcinolone Acetonide, accurately weighed, proceed as directed for *Standard preparation.*

Procedure—Introduce equal volumes (between 15 µL and 25 µL) of the *Assay preparation* and the *Standard preparation* into a high-pressure liquid chromatograph (see *Chromatography* ⟨621⟩) operated at room temperature, by means of a suitable microsyringe or sampling valve. Adjust the operating parameters with *Mobile phase* on the column so that the separation of triamcinolone acetonide and internal standard is optimized, with a retention time of about 14.5 minutes for triamcinolone acetonide. Typically, the apparatus is fitted with a 4-mm × 30-cm column containing packing L1 and is equipped with a UV detector capable of monitoring absorbance at 254 nm, and a suitable recorder. In a suitable chromatogram, the coefficient of variation for five replicate injections of a single specimen is not more than 3.0%; and the resolution factor, *R* (see *Chromatography* ⟨621⟩), between the peaks for triamcinolone acetonide and fluoxymesterone is not less than 2.0. Measure the heights of the internal standard and triamcinolone acetonide peaks at the same retention times obtained from the *Assay preparation* and the *Standard preparation.* Calculate the quantity, in mg, of $C_{24}H_{31}FO_6$ in the portion of Triamcinolone Acetonide taken by the formula:

$$1000C(R_U / R_S)$$

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

Triamcinolone Acetonide Topical Aerosol

» Triamcinolone Acetonide Topical Aerosol is a solution of Triamcinolone Acetonide in a suitable propellant in a pressurized container. It contains not less than 90.0 percent and not more than 115.0 percent of the labeled amount of $C_{24}H_{31}FO_6$.

Packaging and storage—Preserve in pressurized containers, and avoid exposure to excessive heat.

USP Reference standards ⟨11⟩**—**
USP Triamcinolone Acetonide RS

Identification—Apply 20 µL of a solution prepared as directed for *Assay preparation* in the *Assay* but without the addition of the *Internal standard solution*, and 20 µL of a solution of USP Triamcinolone Acetonide RS in methanol containing 30 µg per mL, to a line parallel to and about 1.5 cm from the bottom edge of a thin-layer chromatographic plate (see *Chromatography* ⟨621⟩) coated with a 0.25-mm layer of chromatographic silica gel. Proceed as directed in the *Identification* test under *Triamcinolone Acetonide Cream*, beginning with "Place the plate in a developing chamber." The specified result is obtained.

Microbial enumeration tests ⟨61⟩ **and Tests for specified microorganisms** ⟨62⟩**—**It meets the requirements of the tests for absence of *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

Change to read:

Other requirements—It meets the requirements for *Pressure Test*, *Minimum Fill*, and *Leakage Test* under ● *Topical Aerosols* ⟨603⟩ ● (CN 1-May-2017).

Assay—

Mobile phase—Prepare a degassed solution of water and acetonitrile (70:30).

Internal standard solution—Dissolve fluoxymesterone in methanol to obtain a solution having a concentration of about 25 µg per mL.

Standard preparation—Dissolve an accurately weighed quantity of USP Triamcinolone Acetonide RS in methanol to obtain a solution having a concentration of about 100 µg per mL. Transfer 15.0 mL of this solution to a 50-mL volumetric flask, add 25.0 mL of *Internal standard solution*, dilute with methanol to volume, and mix. This solution has a known concentration of about 30 µg per mL.

Assay preparation—Fit the valve of a previously weighed Triamcinolone Acetonide Aerosol container with a suitable tube assembly so that the contents can be sprayed directly into the bulb portion of a 100-mL volumetric flask containing 50.0 mL of *Internal standard solution* and 20 mL of methanol. Spray a portion of the contents, equivalent to about 3 mg of triamcinolone acetonide, into the flask, determining the exact amount sprayed by difference. Place in a sonic bath for about 5 minutes to expel the propellant. Dilute with methanol to volume, and mix. [NOTE—The propellant is extremely flammable. When evaporating, observe proper precautions and work under an explosion-proof hood.]

Procedure—Introduce equal volumes (between 15 µL and 25 µL) of the *Assay preparation* and the *Standard preparation* into a chromatograph (see *Chromatography* ⟨621⟩) operated at room temperature and fitted with a 3.9-mm × 30-cm column, packed with packing L1, and equipped with a 254-nm detector. Adjust the operating parameters and the *Mobile phase* composition such that the separation of triamcinolone acetonide and internal standard is optimized, with a retention time of about 14 minutes for triamcinolone acetonide. In a suitable system, the relative standard deviation for five replicate injections of the *Standard preparation* is not more than 3.0%. Measure the responses of the internal standard and triamcinolone acetonide peaks at the same retention times obtained from the *Assay preparation* and the *Standard preparation.* Calculate the quantity, in µg, of $C_{24}H_{31}FO_6$ in the portion of Topical Aerosol taken by the formula:

$$100C(R_U / R_S)$$

in which *C* is the concentration, in µg per mL, of USP Triamcinolone Acetonide RS in the *Standard preparation*, and R_U and R_S are the ratios of the peak responses of triamcinolone acetonide to internal standard obtained from the *Assay preparation* and the *Standard preparation*, respectively.

Triamcinolone Acetonide Cream

» Triamcinolone Acetonide Cream is Triamcinolone Acetonide in a suitable cream base. It contains not less than 90.0 percent and not more than 115.0 percent of the labeled amount of $C_{24}H_{31}FO_6$.