Packaging and storage—Preserve in collapsible ophthalmic ointment tubes.

USP Reference standards ⟨11⟩**—**
USP Tetracaine Hydrochloride RS

Identification—

A: The solution employed for measurement of absorbance in the *Assay* exhibits a maximum at 310 ± 2 nm.

B: Dissolve 5 g in 50 mL of ether, extract the ether solution with 5 mL of 3 N hydrochloric acid, and filter the extract. To the extract add 2 mL of potassium thiocyanate solution (1 in 2): a crystalline precipitate is formed, and when recrystallized from water and dried at 80° for 2 hours, it melts between 130° and 132° (see *Melting Range or Temperature* ⟨741⟩).

Sterility ⟨71⟩: meets the requirements .

Minimum fill ⟨755⟩: meets the requirements.

Metal particles—It meets the requirements of the test for *Metal Particles in Ophthalmic Ointments* ⟨751⟩.

Assay—

Standard preparation—Prepare as directed in the *Assay* under *Tetracaine Ointment.*

Assay preparation—Using an accurately weighed portion of Ophthalmic Ointment, prepare as directed in the *Assay* under *Tetracaine Ointment.*

Procedure—Proceed as directed for *Procedure* in the *Assay* under *Tetracaine Ointment.*

Tetracaine and Menthol Ointment

» Tetracaine and Menthol Ointment contains not less than 90.0 percent and not more than 110.0 percent of the labeled amounts of tetracaine ($C_{15}H_{24}N_2O_2$) and menthol ($C_{10}H_{20}O$) in a suitable ointment base.

Packaging and storage—Preserve in collapsible ointment tubes.

USP Reference standards ⟨11⟩**—**
USP Menthol RS
USP Tetracaine Hydrochloride RS

Identification—

A: The solution employed for measurement of absorbance in the *Assay for tetracaine* exhibits a maximum at 310 ± 2 nm (*presence of tetracaine*).

B: Dissolve 5 g in 50 mL of ether, extract the ether solution with 5 mL of 3 N hydrochloric acid, and filter the acid extract. Add 2 mL of potassium thiocyanate solution (1 in 2) to the filtrate: a crystalline precipitate is formed, and when recrystallized from water and dried at 80° for 2 hours, it melts between 130° and 132° (see *Melting Range or Temperature* ⟨741⟩) (*presence of tetracaine*).

C: When chromatographed as directed in the *Assay for menthol*, the *Assay preparation* exhibits a major peak for menthol, the retention time of which corresponds to that exhibited by menthol in the *Standard preparation*.

Minimum fill ⟨755⟩: meets the requirements.

Assay for tetracaine—

Standard preparation—Prepare as directed in the *Assay* under *Tetracaine Ointment*.

Assay preparation—Using Ointment, proceed as directed in the *Assay* under *Tetracaine Ointment*.

Procedure—Proceed as directed for *Procedure* in the *Assay* under *Tetracaine Ointment*.

Assay for menthol—

Internal standard solution—Dissolve decanol in *n*-hexane to obtain a solution having a concentration of about 1 mg per mL.

Standard preparation—Dissolve an accurately weighed quantity of USP Menthol RS in *n*-hexane to obtain a solution having a known concentration of about 1 mg per mL. Transfer 5.0 mL of this solution and 5.0 mL of *Internal standard solution* to a 50-mL volumetric flask, dilute with ether to volume, and mix. Combine 2.0 mL of this solution and 2.0 mL of ether in a suitable container, and mix. This *Standard preparation* has a known concentration of about 0.05 mg per mL.

Assay preparation—Transfer an accurately weighed quantity of Ointment, equivalent to about 5 mg of menthol, to a 50-mL volumetric flask, add 5.0 mL of *Internal standard solution*, dilute with *n*-hexane to volume, mix, and sonicate. Using a suitable syringe attached firmly to a 25- × 12.5-mm chromatographic cartridge containing packing L4, force 2.0 mL of the solution through the cartridge at a rate of 1 mL per 12 seconds. Wash the cartridge at the same rate with two 5-mL portions of *n*-hexane, and discard the washings. Force two 2.0-mL portions of ether through the cartridge, combine the ether eluates in a suitable container, and mix.

Chromatographic system (see *Chromatography* ⟨621⟩)—The gas chromatograph is equipped with a flame-ionization detector and contains a 2-mm × 1.8-m column packed with 10% phase G16 on support S1AB. The column temperature is maintained isothermally at about 170°, the injection port temperature is maintained at about 260°, and the detector block temperature is maintained at about 240°. Dry helium is used as the carrier gas at a flow rate of about 50 mL per minute.

System suitability—Chromatograph three injections of the *Standard preparation*, and record the peak responses as directed for *Procedure:* the retention time of menthol is about 0.7 relative to decanol; the resolution, *R,* between the 2 peaks is not less than 2.5; and the relative standard deviation of the ratio of the peak response obtained with menthol to that obtained with decanol is not more than 2%.

Procedure—Separately inject equal volumes (about 2 µL) of the *Assay preparation* and the *Standard preparation* into the gas chromatograph, and measure the peak responses for menthol and decanol in each chromatogram. Calculate the quantity, in mg, of $C_{10}H_{20}O$ in the portion of Ointment taken by the formula:

$$100C(R_U / R_S)$$

in which *C* is the concentration, in mg per mL, of USP Menthol RS in the *Standard preparation;* and R_U and R_S are the peak response ratios of menthol to decanol obtained from the *Assay preparation* and the *Standard preparation*, respectively.

Tetracaine Hydrochloride

$C_{15}H_{24}N_2O_2 \cdot HCl$ 300.82
Benzoic acid, 4-(butylamino)-, 2-(dimethylamino)ethyl ester, monohydrochloride.
2-(Dimethylamino)ethyl *p*-(butylamino)benzoate monohydrochloride [136-47-0].

» Tetracaine Hydrochloride contains not less than 98.5 percent and not more than 101.0 percent of $C_{15}H_{24}N_2O_2 \cdot HCl$, calculated on the anhydrous basis.

Packaging and storage—Preserve in tight, light-resistant containers.

Labeling—Where it is intended for use in preparing injectable dosage forms, the label states that it is sterile or must be subjected to further processing during the preparation of injectable or other sterile dosage forms.

USP Reference standards ⟨11⟩**—**
USP Endotoxin RS
USP Tetracaine Hydrochloride RS

Identification—

A: *Ultraviolet Absorption* ⟨197U⟩—

Solution—Prepare the test solution as follows. Dissolve about 50 mg, accurately weighed, in water to make 250.0 mL. Pipet 5 mL of this solution into a 100-mL volumetric flask, add 2 mL of *Buffer No. 6, 10 Percent, pH 6.0* (see *Antibiotics—Microbial Assays* ⟨81⟩), then dilute with water to volume, and mix. For the purposes of this test, *Buffer No. 6, 10 Percent, pH 6.0* does not have to be sterilized.

Absorptivities at 310 nm, calculated on the anhydrous basis, do not differ by more than 2.0%.

B: Dissolve 100 mg in 10 mL of water, and add 1 mL of potassium thiocyanate solution (1 in 4): a crystalline precipitate is formed. Recrystallize the precipitate from water, and dry at 80° for 2 hours: it melts between 130° and 132°.

C: A solution of 100 mg in 5 mL of water meets the requirements of the tests for *Chloride* ⟨191⟩.

Water, *Method I* ⟨921⟩**:** not more than 2.0%.

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

Chromatographic purity—Dissolve an accurately weighed quantity in water to obtain a test solution containing 50 mg per mL, and proceed as directed in the test for *Chromatographic purity* under *Tetracaine*, beginning with "Prepare a Standard solution."

Other requirements—Where the label states that Tetracaine Hydrochloride is sterile, it meets the requirements for *Sterility Tests* ⟨71⟩ and for *Bacterial endotoxins* under *Tetracaine Hydrochloride for Injection.* Where the label states that Tetracaine Hydrochloride must be subjected to further processing during the preparation of injectable or other sterile dosage forms, it meets the requirements for *Bacterial endotoxins* under *Tetracaine Hydrochloride for Injection.*

Assay—Transfer about 500 mg of Tetracaine Hydrochloride, accurately weighed, to a suitable vessel, add 5 mL of hydrochloric acid and 50 mL of water, and proceed as directed under *Nitrite Titration* ⟨451⟩, beginning with "cool to 15°." Each mL of 0.1 M sodium nitrite is equivalent to 30.08 mg of $C_{15}H_{24}N_2O_2 \cdot HCl$.

Tetracaine Hydrochloride Cream

» Tetracaine Hydrochloride Cream contains Tetracaine Hydrochloride ($C_{15}H_{24}N_2O_2 \cdot HCl$) equivalent to not less than 90.0 percent and not more than 110.0 percent of the labeled amount of tetracaine ($C_{15}H_{24}N_2O_2$) in a suitable water-miscible base.

Packaging and storage—Preserve in collapsible, lined metal tubes.

USP Reference standards ⟨11⟩**—**
USP Tetracaine Hydrochloride RS

Identification, *Ultraviolet Absorption* ⟨197U⟩**:** *Assay preparation* compared to the *Standard preparation* from the *Assay*.

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*.

Minimum fill ⟨755⟩: meets the requirements.

pH ⟨791⟩: between 3.2 and 3.8.

Assay—

pH 6 Acetate buffer—Dissolve 250 g of sodium acetate in about 500 mL of water in a 1000-mL volumetric flask, add 5.0 mL of glacial acetic acid, dilute with water to volume, and mix.

Standard preparation—Transfer about 25 mg of USP Tetracaine Hydrochloride RS, accurately weighed, to a 100-mL volumetric flask, dissolve in isopropyl alcohol, add isopropyl alcohol to volume, and mix. Transfer 2.0 mL of this solution to another 100-mL volumetric flask, add 2.0 mL of *pH 6 Acetate buffer*, dilute with isopropyl alcohol to volume, and mix. The concentration of USP Tetracaine Hydrochloride RS in the *Standard preparation* is about 5 µg per mL.

Assay preparation—Transfer an accurately weighed portion of Cream, equivalent to about 4.5 mg of tetracaine, to a 50-mL beaker, add 25 mL of isopropyl alcohol, and warm on a steam bath to dissolve the specimen completely. Transfer the solution with the aid of isopropyl alcohol to a 100-mL volumetric flask, dilute with isopropyl alcohol to volume, and mix. Transfer 10.0 mL of this solution to another 100-mL volumetric flask, add 2.0 mL of *pH 6 Acetate buffer*, dilute with isopropyl alcohol to volume, and mix.

Procedure—Concomitantly determine the absorbances of the *Assay preparation* and the *Standard preparation* in 1-cm cells at the wavelength of maximum absorbance at about 310 nm, with a suitable spectrophotometer, using a 1 in 50 solution of *pH 6 Acetate buffer* in isopropyl alcohol as the blank. Calculate the quantity, in mg, of $C_{15}H_{24}N_2O_2$ in the portion of Cream taken by the formula:

$$(264.36/300.82)(C)(A_U / A_S)$$

in which 264.36 and 300.82 are the molecular weights of tetracaine and tetracaine hydrochloride, respectively; C is the concentration, in µg per mL, of USP Tetracaine Hydrochloride RS in the *Standard preparation;* and A_U and A_S are the absorbances of the *Assay preparation* and the *Standard preparation*, respectively.

Tetracaine Hydrochloride Injection

» Tetracaine Hydrochloride Injection is a sterile solution of Tetracaine Hydrochloride in Water for Injection. It contains not less than 95.0 percent and not more than 105.0 percent of the labeled amount of $C_{15}H_{24}N_2O_2 \cdot HCl$.

Packaging and storage—Preserve in single-dose or in multiple-dose containers, preferably of Type I glass, under refrigeration and protected from light. It may be packaged in 100-mL multiple-dose containers. Injection supplied as a component of spinal anesthesia trays may be stored at room temperature for 12 months.

Labeling—Label it to indicate that the Injection is not to be used if it contains crystals, or if it is cloudy or discolored.

USP Reference standards ⟨11⟩**—**
USP Endotoxin RS
USP Tetracaine Hydrochloride RS

Identification—

A: It responds to *Identification* test *B* under *Tetracaine Hydrochloride.*

B: The chromatogram of the *Assay preparation* obtained as directed in the *Assay* exhibits a major peak for tetracaine, the retention time of which corresponds to that in the chromatogram of the *Standard preparation* as obtained in the *Assay.*

Bacterial endotoxins ⟨85⟩**—**It contains not more than 0.7 USP Endotoxin Unit per mg of tetracaine hydrochloride.

pH ⟨791⟩: between 3.2 and 6.0.

Particulate matter ⟨788⟩: meets the requirements under small-volume injections.

Other requirements—It meets the requirements under *Injections* ⟨1⟩.