

BRIEFING

Olopatadine Hydrochloride Ophthalmic Solution—See briefing under *Olopatadine Hydrochloride*.

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Add the following:

■ Olopatadine Hydrochloride Ophthalmic Solution

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» Olopatadine Hydrochloride Ophthalmic Solution is a sterile aqueous solution of Olopatadine Hydrochloride. It contains not less than 90.0 percent and not more than 110.0 percent of the labeled amount of olopatadine ($C_{21}H_{23}NO_3$). It may contain suitable antimicrobial agents.

Packaging and storage—Preserve in tight containers. Store at controlled room temperature.

USP Reference standards (11)—*USP Olopatadine Hydrochloride RS*, *USP Olopatadine Hydrochloride Related Compound A RS*.

Identification—The retention time of the major peak in the chromatogram of the *Assay preparation* corresponds to that in the chromatogram of the *Standard preparation*, as obtained in the *Assay*.

Antimicrobial effectiveness (51): meets the requirements.

Sterility (71)—It meets the requirements when tested as directed for *Membrane Filtration* under *Test for Sterility of the Product to be Examined*.

pH (791): between 6.5 and 7.5.

Osmolarity (785): between 250 and 350 mOsmol per kg.

Related compounds—

Mobile phase and *Chromatographic system*—Proceed as directed in the *Assay*.

Standard solution—Dissolve an accurately weighed quantity of USP Olopatadine Hydrochloride RS in methanol, with sonication if necessary, to obtain a solution having a known concentration of about 0.01 mg per mL.

Test solution—Use the undiluted Ophthalmic Solution.

Procedure—Separately inject equal volumes (about 10 μ L) of the *Standard solution* and the *Test solution* into the chromatograph, and allow the chromatogram to run for at least three times the retention time of the major peak. Record the chromatograms, and measure the peak areas. Calculate the percentage of any individual impurity in the portion of Ophthalmic Solution taken by the formula:

$$100(337.41/373.87)(C/L)(r_U/r_S)$$

in which 337.41 and 373.87 are the molecular weights of olopatadine and olopatadine hydrochloride, respectively; C is the concentration, in mg per mL, of USP Olopatadine Hydrochloride RS in the *Standard solution*; L is the label claim, in mg per mL, of olopatadine; r_U is the peak area of any individual impurity obtained from the *Test solution*; and r_S is the peak area of olopatadine hydrochloride obtained from the *Standard solution*: not more than 1.0% of any individual impurity is found; and not more than 2.0% of total impurities is found.

Assay—

Phosphate buffer—Prepare a solution of 0.05 M monobasic potassium phosphate in water.

Mobile phase—Prepare a mixture of *Phosphate buffer*, acetonitrile, and triethylamine (760:240:2). Adjust with 85% phosphoric acid to a pH of 4.5. Make adjustments if necessary (see *System Suitability* under *Chromatography* (621)).

System suitability solution—Dissolve accurately weighed quantities of USP Olopatadine Hydrochloride RS and USP Olopatadine Hydrochloride Related Compound A RS in

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methanol, with sonication if necessary, to obtain a solution having known concentrations of about 0.1 mg per mL and 0.01 mg per mL, respectively.

Standard preparation—Dissolve an accurately weighed quantity of USP Olopatadine Hydrochloride RS in methanol, with sonication if necessary, to obtain a solution having a known concentration of about 0.1 mg per mL.

Assay preparation—Shake and transfer an accurately measured volume of Ophthalmic Solution into a suitable volumetric flask, dilute with methanol to volume, and mix to obtain a solution having a known concentration of about 0.1 mg per mL of olopatadine, based on the label claim. Centrifuge a portion at 3500 rpm for 5 minutes, and use the clear supernatant for injection.

Chromatographic system (see *Chromatography* <621>)—The liquid chromatograph is equipped with a 254-nm detector and a 3.9-mm × 15-cm column that contains 5-μm packing L1. The flow rate is about 1 mL per minute. Chromatograph the *System suitability solution*, and record the peak areas as directed for *Procedure*: the relative standard deviation for replicate injections is not more than 2.0%; the tailing factor of the olopatadine hydrochloride peak is not more than 2.0; the column efficiency, determined from the olopatadine hydrochloride peak, is not less than 1500 theoretical plates; and the

resolution, R , between olopatadine hydrochloride and olopatadine hydrochloride related compound A is not less than 5.0.

[NOTE—The relative retention time of olopatadine hydrochloride related compound A, measured with respect to olopatadine hydrochloride, is about 0.6.]

Procedure—Inject equal volumes (about 10 μL) of the *Standard preparation* and the *Assay preparation* into a chromatograph, record the chromatograms, and measure the peak areas. Calculate the quantity of $C_{21}H_{23}NO_3$, in percentage of the label claim, in the portion of Ophthalmic Solution taken by the formula:

$$100(337.41/373.87)(C V_A / V L)(r_U / r_S)$$

in which 337.41 and 373.87 are the molecular weights of olopatadine and olopatadine hydrochloride, respectively; C is the concentration, in mg per mL, of USP Olopatadine Hydrochloride RS in the *Standard preparation*; V_A is the volume, in mL, of Ophthalmic Solution in the *Assay preparation*; V is the volume, in mL, of Ophthalmic Solution taken; L is the label claim, in mg per mL, of olopatadine; and r_U and r_S are the peak areas obtained from the *Assay preparation* and the *Standard preparation*, respectively. ■