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Homatropine Eye Drops

General Notices

Action and use

Anticholinergic.

DEFINITION

Homatropine Eye Drops are a sterile solution of Homatropine Hydrobromide in Purified Water.

The eye drops comply with the requirements stated under Eye Preparations and with the following requirements.

Content of homatropine hydrobromide, $C_{16}H_{21}NO_3$,HBr

90.0 to 110.0% of the stated amount.

IDENTIFICATION

A. To a volume containing 60 mg of Homatropine Hydrobromide add 3 mL of 5M *ammonia*, extract with 15 mL of *chloroform*, dry the chloroform over *anhydrous sodium sulfate*, filter and evaporate the filtrate to dryness. The *infrared absorption spectrum* of the residue, Appendix II A, is concordant with the *reference spectrum* of homatropine *(RS 175)*.
B. In the Assay, the chromatogram obtained with solution (2) shows a peak with the same retention time as the peak derived from homatropine hydrobromide in the chromatogram obtained with solution (3).
C. To 1 mL of the eye drops, diluted with *water* if necessary to give a solution containing 1% w/v of Homatropine Hydrobromide, add 1 mL of 5M *ammonia*, shake with *chloroform* and evaporate the chloroform solution to dryness on a water bath. To the residue add 1.5 mL of a 2% w/v solution of *mercury(II) chloride* in *ethanol (60%)*. A yellow colour is produced which becomes red on gentle warming (distinction from most other alkaloids except atropine and hyoscyamine).

TESTS

Tropine

Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions.

(1) Use the eye drops diluted, if necessary, with *water* to contain 1% w/v of Homatropine Hydrobromide.
(2) 0.0050% w/v of *tropine*.

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel G*.
(b) Use the mobile phase as described below.
(c) Apply 40 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry it at 100° to 105° until the solvent has evaporated, allow to cool and spray with *dilute potassium iodobismuthate solution* until spots appear.

MOBILE PHASE

33 volumes of *anhydrous formic acid*, 33 volumes of *water* and 134 volumes of *ethyl acetate*.

LIMITS

Any spot corresponding to tropine in the chromatogram obtained with solution (1) is not more intense than the spot in the chromatogram obtained with solution (2) (0.5%).

ASSAY

Carry out the method for *gas chromatography*, Appendix III B. Prepare a 2% w/v solution of *atropine sulfate BPCRS* (internal standard) in *methanol* (solution A).

(1) Add 1 mL of solution A and 1 mL of 5M *ammonia* to a volume of the eye drops containing 20 mg of Homatropine Hydrobromide, diluted if necessary to 5 mL with *water*. Extract with two 5-mL quantities of *chloroform*, shake the combined extracts with 1 g of *anhydrous sodium sulfate*, filter and evaporate the filtrate to dryness. Dissolve the residue in 10 mL of *dichloromethane*. To 1 mL of this solution add 0.2 mL of a mixture of 4 volumes of N,O-*bis(trimethylsilyl)acetamide* and 1 volume of *trimethylchlorosilane*, mix and allow to stand for 30 minutes.
(2) Prepare in the same manner as solution (1) but omitting the addition of solution A.
(3) Add 1 mL of solution A and 1 mL of 5M *ammonia* to 5 mL of a 0.4% w/v solution of *homatropine hydrobromide BPCRS*. Complete the procedure described under solution (1), beginning at the words 'Extract with two 5-mL quantities of *chloroform*…'.

CHROMATOGRAPHIC CONDITIONS

(a) Use a glass column (1.5 m × 4 mm) packed with *acid-washed, silanised diatomaceous support* (80 to 100 mesh) coated with 3% w/w of phenyl methyl silicone fluid (50% phenyl) (OV-17 is suitable).
(b) Use *helium* as the carrier gas at 1.7 mL per minute.
(c) Use isothermal conditions maintained at 220°.
(d) Use an inlet temperature of 220°.
(e) Use a flame ionisation detector at a temperature of 220°.
(f) Inject 1 µL of each solution.

DETERMINATION OF CONTENT

Calculate the content of $C_{16}H_{21}NO_3$,HBr using the ratios of the peaks and the declared content of $C_{16}H_{21}NO_3$,HBr in *homatropine hydrobromide BPCRS*.