Edition: BP 2025 (Ph. Eur. 11.6 update)

Labetalol Injection

General Notices

Action and use

Alpha- and beta-adrenoceptor antagonist.

DEFINITION

Labetalol Injection is a sterile solution of Labetalol Hydrochloride in Water for Injections.

The injection complies with the requirements stated under Parenteral Preparations and with the following requirements.

Content of labetalol hydrochloride, $C_{19}H_{24}N_2O_3$,HCl

90.0 to 110.0% of the stated amount.

CHARACTERISTICS

A colourless or very pale yellow solution.

IDENTIFICATION

A. Mix a volume containing 50 mg of Labetalol Hydrochloride with 50 mL of 0.1M *hydrochloric acid* and heat on a water bath for 30 minutes. Cool, filter, add 10 mL of *ammonia buffer pH 10.0* and extract with three 15-mL quantities of *dichloromethane*. Shake the combined extracts with 5 g of *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 labetalol *(RS 199)*.
B. The *light absorption*, Appendix II B, in the range 250 to 400 nm, of a 0.004% w/v solution of the residue obtained in test A in 0.1M *sodium hydroxide* exhibits a maximum only at 333 nm.

TESTS

Acidity

pH, 3.5 to 4.5, Appendix V L.

Free carboxylic acid and other related substances

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

(1) Dilute a volume of the injection containing 80 mg of Labetalol Hydrochloride to about 50 mL with *ethanol (96%)*, evaporate to dryness using a rotary evaporator and dissolve the residue in 1 mL of *methanol*.
(2) Dilute 1 volume of solution (1) to 200 volumes with *methanol*.

(3) 0.160% w/v of *5-[1-hydroxy-2-(1-methyl-3-phenylpropylamino)ethyl]salicylic acid hydrochloride BPCRS* in *methanol*.

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel F_{254}*.
(b) Use the mobile phase as described below.
(c) Apply 20 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry it in a current of warm air, heat at 105° for 30 minutes, cool and examine under *ultraviolet light (254 nm)*.

MOBILE PHASE

5 volumes of 13.5M *ammonia*, 25 volumes of *methanol* and 75 volumes of *dichloromethane*.

LIMITS

In the chromatogram obtained with solution (1):

any spot corresponding to 5-[1-hydroxy-2-(1-methyl-3-phenylpropylamino)ethyl]salicylic acid is not more intense that the spot in the chromatogram obtained with solution (3) (2%);

any other *secondary spot* is not more intense than the spot in the chromatogram obtained with solution (2) (0.5%).

ASSAY

Dilute a volume containing 50 mg of Labetalol Hydrochloride to 100 mL with *water*. To 10 mL of the solution add 10 mL of 0.05M *sulfuric acid* and dilute to 100 mL with *water*. Measure the *absorbance* of the resulting solution at the maximum at 302 nm, Appendix II B. Calculate the content of $C_{19}H_{24}N_2O_3$,HCl in the injection taking 86 as the value of A(1%, 1 cm) at the maximum at 302 nm.

STORAGE

Labetalol Injection should be protected from light.