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

Lamivudine Tablets

General Notices

Action and use

Nucleoside reverse transcriptase inhibitor; antiviral (HIV).

DEFINITION

Lamivudine Tablets contain Anhydrous Lamivudine.

The tablets comply with the requirements stated under Tablets and with the following requirements.

Content of lamivudine, $C_8H_{11}N_3O_3S$

95.0 to 105.0% of the stated amount.

IDENTIFICATION

To a quantity of the powdered tablets containing 50 mg of Anhydrous Lamivudine add 20 mL of *methanol*, shake, filter and evaporate the filtrate to dryness. The *infrared absorption spectrum*, Appendix II A, is concordant with the *reference spectrum* of lamivudine (*RS 451*).

TESTS

Dissolution

Comply with the *dissolution test for tablets and capsules*, Appendix XII B1.

TEST CONDITIONS

(a) Use Apparatus 2 and rotate the paddle at 50 revolutions per minute.
(b) Use 900 mL of 0.1M *hydrochloric acid*, at a temperature of 37°, as the medium.

PROCEDURE

(1) After 45 minutes withdraw a sample of the medium and measure the *absorbance* of the filtered sample, suitably diluted with the dissolution medium if necessary, at the maximum at 280 nm, Appendix II B, using dissolution medium in the reference cell.
(2) Measure the *absorbance* of a suitable solution of *lamivudine BPCRS* using dissolution medium in the reference cell.

DETERMINATION OF CONTENT

Calculate the total content of lamivudine, $C_8H_{11}N_3O_3S$, in the medium from the absorbances obtained and using the declared content of $C_8H_{11}N_3O_3S$ in *lamivudine BPCRS*.

LIMITS

The amount of lamivudine released is not less than 75% (Q) of the stated amount.

Related substances

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions.

(1) Shake a quantity of the powdered tablets containing 0.3 g of Anhydrous Lamivudine in 60 mL of *water* with the aid of ultrasound for 30 minutes, dilute to 100 mL and filter. Dilute 1 volume of the filtrate to 10 volumes with the mobile phase.
(2) Dilute 1 volume of solution (1) to 50 volumes with the mobile phase and further dilute 1 volume to 10 volumes with the mobile phase.
(3) Dilute 1 volume of solution (2) to 2 volumes with the mobile phase.
(4) 0.03% w/v of *lamivudine impurity standard BPCRS*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *octadecylsilyl silica gel for chromatography* (5 µm) (Hypersil BDS is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1.0 mL per minute.
(d) Use a column temperature of 35°.
(e) Use a detection wavelength of 277 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

5 volumes of *methanol* and 95 volumes of 0.025M *ammonium acetate*, the pH of the aqueous component having previously been adjusted to 4.0 with *glacial acetic acid*.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (4):

the chromatogram closely resembles the reference chromatogram supplied with *lamivudine impurity standard BPCRS*;

the *resolution factor* between the peaks due to lamivudine impurity B and lamivudine is at least 2.0.

LIMITS

Using the chromatogram obtained with solution (4) and the reference chromatogram supplied with *lamivudine impurity standard BPCRS* identify any peaks in solution (1) corresponding to impurity A and impurity B.

In the chromatogram obtained with solution (1):

the area of any peak corresponding to lamivudine impurity A is not greater than 1.5 times the area of the peak due to lamivudine in the chromatogram obtained with solution (2) (0.3%);

the area of any peak corresponding to lamivudine impurity B is not greater than the area of the peak due to lamivudine in the chromatogram obtained with solution (2) (0.2%);

the area of any other *secondary peak* is not greater than the area of the peak due to lamivudine in the chromatogram obtained with solution (2) (0.2%);

the sum of the areas of all the *secondary peaks* is not greater than 3 times the area of the peak due to lamivudine in the chromatogram obtained with solution (2) (0.6%).

Disregard any peak with an area less than the area of the peak in the chromatogram obtained with solution (3) (0.1%).

ASSAY

Weigh and powder 20 tablets. Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions.

(1) Shake a quantity of the powdered tablets containing 0.3 g of Anhydrous Lamivudine in 60 mL of *water* with the aid of ultrasound for 30 minutes, dilute to 100 mL with the mobile phase and filter. Dilute 1 volume of the filtrate to 10 volumes with the mobile phase.
(2) 0.03% w/v of *lamivudine BPCRS* in the mobile phase.
(3) 0.03% w/v of *lamivudine impurity standard BPCRS* in the mobile phase.

CHROMATOGRAPHIC CONDITIONS

The chromatographic conditions described under Related substances may be used.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3):

the *resolution factor* between the peaks due to lamivudine impurity B and lamivudine is at least 2.0.

DETERMINATION OF CONTENT

Calculate the content of $C_8H_{11}N_3O_3S$ in the tablets using the declared content of $C_8H_{11}N_3O_3S$ in *lamivudine BPCRS*.

IMPURITIES

The impurities limited by the requirements of this monograph include impurities A, B, C, E, F, G, H, I and J listed under Anhydrous Lamivudine.