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

Vancomycin Eye Drops

General Notices

NOTE: This monograph has been developed to cover unlicensed formulations.

Action and use

Glycopeptide antibacterial.

DEFINITION

Vancomycin Eye Drops are a sterile solution of Vancomycin Hydrochloride in Purified Water.

The eye drops comply with the requirements stated under Eye Preparations and with the following requirements. Where appropriate, the eye drops also comply with the requirements stated under Unlicensed Medicines.

IDENTIFICATION

A. In the test for Vancomycin B, the retention time of the principal peak in the chromatogram obtained with solution (1) is similar to that of the principal peak in the chromatogram obtained with solution (4).
B. Yield reaction A characteristic of *chlorides*, Appendix VI.

TESTS

Acidity

pH, 2.5 to 4.5, Appendix V L.

Vancomycin B

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions. Use the solutions within 4 hours of preparation.

(1) Dilute a volume of the eye drops with sufficient mobile phase A to produce a solution containing about 0.2% w/v of Vancomycin Hydrochloride.
(2) Dilute 1 volume of solution (1) to 25 volumes with mobile phase A.
(3) Dilute 1 volume of solution (2) to 40 volumes with mobile phase A.
(4) Heat a 0.050% w/v solution of *vancomycin hydrochloride EPCRS* in mobile phase A at 65° for 24 hours and allow to cool.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *end-capped octadecylsilyl silica gel for chromatography* (5 µm) (Hypersil ODS is suitable).
(b) Use gradient elution and the mobile phase described below.
(c) Use a flow rate of 1 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 280 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

Mobile phase A To 4 volumes of *triethylamine* add 1996 volumes of *water* and adjust to pH 3.2 with *orthophosphoric acid* (solution A). Add 10 volumes of *tetrahydrofuran* and 70 volumes of *acetonitrile* to 920 volumes of solution A.

Mobile phase B Add 10 volumes of *tetrahydrofuran* and 290 volumes of *acetonitrile* to 700 volumes of solution A.

Use the following gradient.

Time (Minutes)	Mobile phase A (% v/v)	Mobile phase B (% v/v)	Comment
0-13	100	0	isocratic
13-21	100→0	0→100	linear gradient
21-25	0	100	isocratic
25-35	100	0	re-equilibration

SYSTEM SUITABILITY

The test is not valid unless:

in the chromatogram obtained with solution (3), the principal peak has a *signal-to-noise ratio* of at least 5;

in the chromatogram obtained with solution (2), the *symmetry factor* of the vancomycin peak is not greater than 1.6;

in the chromatogram obtained with solution (4), the *resolution* between the two principal peaks is at least 5.0.

LIMITS

Not less than 88.0%, calculated using the following expression:

$$\frac{A_b \times 100}{A_b + \left(\frac{A_t}{25}\right)}$$

where,

A_b = area of the peak corresponding to vancomycin B in the chromatogram obtained with solution (2);

A_t = sum of the areas of the peaks corresponding to impurities in the chromatogram obtained with solution (1).

Related substances

Carry out the method for *liquid chromatography*, Appendix III D, using solutions (1), (2) and (3) described under Vancomycin B.

CHROMATOGRAPHIC CONDITIONS

The chromatographic conditions described under Vancomycin B may be used.

LIMITS

In the chromatogram obtained with solution (1) calculate the percentage content of each impurity using the following expression:

$$\frac{\left(\frac{A_i}{25}\right) \times 100}{A_b + \left(\frac{A_t}{25}\right)}$$

where,

A_i = area of an impurity peak in the chromatogram obtained with solution (1),

A_b = area of the peak corresponding to vancomycin B in the chromatogram obtained with solution (2),

A_t = sum of the areas of the peaks corresponding to impurities in the chromatogram obtained with solution (1).

The content of any impurity is not greater than 4.0% and the sum of the contents of any such impurities is not greater than 12.0%.

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

ASSAY

Carry out the *microbiological assay of antibiotics*, Appendix XIV A. The precision of the assay is such that the fiducial limits of error are not less than 95% and not more than 105% of the estimated potency.

The upper fiducial limit of error is not less than 95.0% and the lower fiducial limit of error is not more than 115.0% of the stated content.