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

Teicoplanin for Injection

General Notices

Action and use

Glycopeptide antibacterial.

DEFINITION

Teicoplanin for Injection is a sterile material consisting of Teicoplanin with or without excipients. It is supplied in a sealed container.

The contents of the sealed container complies with the requirements for Powders for Injections or Infusions stated under Parenteral Preparations and with the following requirements.

IDENTIFICATION

The *infrared absorption spectrum*, Appendix II A, is concordant with the reference spectrum of teicoplanin *(RS 510)*.

TESTS

Acidity or alkalinity

pH of the injection reconstituted according to the manufacturer's instructions, 6.0 to 8.0, Appendix V L.

Composition

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

(1) Dissolve a quantity of the contents of a sealed container in sufficient *water* to produce a solution containing 2000 IU per mL of Teicoplanin.
(2) 0.2% w/v of *teicoplanin for identification EPCRS*.
(3) Dilute 1 volume of solution (2) to 200 volumes.
(4) 0.002% w/v of *mesityl oxide EPCRS* (impurity A).
(5) Dilute 1 volume of solution (1) to 100 volumes. Further dilute 1 volume of this solution to 10 volumes.

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-RP 18 is suitable).
(b) Use gradient elution and the mobile phase described below.
(c) Use a flow rate of 2.3 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 254 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

Mobile phase A 100 volume of *acetonitrile* and 900 volumes of a 0.3% w/v solution of *sodium dihydrogen orthophosphate* previously adjusted to pH 6.0 with 1M *sodium hydroxide*.

Mobile phase B 300 volumes of a 0.3% w/v solution of *sodium dihydrogen orthophosphate* previously adjusted to pH 6.0 with 1M *sodium hydroxide* and 700 volumes of *acetonitrile*.

Time (Minutes)	Mobile phase A (% v/v)	Mobile phase B (% v/v)	Comment
0-30	100→50	0→50	linear gradient
30-31	50→10	50→90	linear gradient
31-35	10	90	isocratic
35-36	10→100	90→0	linear gradient
36-40	100	0	re-equilibration

Use the chromatogram supplied with *teicoplanin for identification EPCRS* and the chromatogram obtained with solution (2) to identify the groups and components of teicoplanin.

When the chromatograms are recorded under the prescribed conditions, the relative retentions with reference to teicoplanin A_{2-2} (retention time about 18 minutes) are detailed in the following table.

Group	Subgroup	Component	Relative retention
teicoplanin A_3 group			≤0.70
		teicoplanin A_{3-1}	about 0.43
teicoplanin A_2 group			>0.70
	teicoplanin A_{2-1} group		>0.70 and <1.00
		teicoplanin A_{2-1a}	about 0.85
		teicoplanin A_{2-1b}	about 0.88
		teicoplanin A_{2-1}	about 0.93
		teicoplanin A_{2-2}	1.00
	teicoplanin A_{2-3} group		>1.00 and <1.12
		teicoplanin A_{2-3}	about 1.03
		teicoplanin A_{2-4}	about 1.12
	teicoplanin A_{2-5} group		>1.12 and <1.25
		teicoplanin A_{2-5}	about 1.15
	teicoplanin A_{2-6} group		≥1.12
		teicoplanin-like related substance RS A_{2-6a}	about 1.25
		teicoplanin-like related substance RS A_{2-6b}	about 1.30
		teicoplanin-like related substance RS A_{2-6c}	about 1.38

SYSTEM SUITABILITY

The test is not valid unless:

in the chromatogram obtained with solution (2), the *resolution* between the peaks due to teicoplanin A_{2-4} and teicoplanin A_{2-5} is at least 1.0;

in the chromatogram obtained with solution (3), the *signal-to-noise ratio* of the peak due to teicoplanin A_{2-2} is at least 40.

CALCULATION OF COMPOSITION

In the chromatogram obtained with solution (1), integrate all peaks present with an area greater than the area of the principal peak in the chromatogram obtained with solution (5) and use the following equation to determine total peak area. Use the chromatogram obtained with solution (4) to identify any peak present due to impurity A.

$S_2 + (0.83 \times S_3)$

where:

S_2 = sum of the areas of the peaks due to teicoplanin A_2 group;

S_3 = sum of the areas of the peaks due to teicoplanin A_3 group disregarding any peak due to impurity A;

Calculate the percentage content for each teicoplanin groups and components in the injection by *normalisation*.

LIMITS

The proportions are within the following limits:

— teicoplanin A_2 group: not less than 78%;

— teicoplanin A_3 group: not more than 17%.

Related substances

Carry out the method for *liquid chromatography*, Appendix III D, as described in the test for Composition.

CALCULATION OF IMPURITIES

Use the chromatogram obtained with solution (2) to identify all peaks present above the disregard limit as teicoplanin-like related substances. Any peak present in any part of the chromatogram obtained with solution (1) that cannot be correlated to a peak above the disregard limit in solution (2) should be considered as a non-teicoplanin-like impurity, unless it is characterised by other means. Use the chromatogram obtained with solution (4) to identify any peak present due to impurity A.

A teicoplanin-like related substance is defined as a substance that shares the same glycopeptide core structure of the parent molecule, composed of a linear heptapeptide aglycone, an α-D-mannose and an acetyl-β-D-glucosamine.

The R' side chains in the teicoplanin-like related substances RS A_{2-6a}, RS A_{2-6b} and RS A_{2-6c} are unknown.

Calculate the percentage content of the impurities in the injection by *normalisation*.

LIMITS

— any non-teicoplanin-like impurity: not more than 0.5%;

— total non-teicoplanin-like impurities: not more than 1.5%;

— Disregard any peak due to impurity A.

ASSAY

Determine the weight of the contents of 10 containers as described in the test for *uniformity of weight*, Appendix XII C1, Powders for Parenteral Administration.

Mix the contents of the 10 containers and 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.

For a container of average content weight, 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 number of IU.

LABELLING

The label of the sealed container states (1) the total number of IU (Units) contained in it; (2) the number of IU (Units) per mg.

IMPURITIES

The impurities limited by the requirements of this monograph include those listed under Teicoplanin, excluding impurity A.