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

Gentamicin Cream

General Notices

Action and use

Aminoglycoside antibacterial.

DEFINITION

Gentamicin Cream is a viscous oil-in-water emulsion containing Gentamicin Sulfate dissolved in the aqueous phase.

The cream complies with the requirements stated under Topical Semi-solid Preparations and with the following requirements.

IDENTIFICATION

A. Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions.
(1) Disperse a quantity of the cream containing the equivalent of 7.5 mg of gentamicin in 20 mL of *chloroform*, extract with 10 mL of *water* and use the aqueous layer.
(2) A solution of *gentamicin sulfate BPCRS* in *water* containing the equivalent of 0.075% w/v of gentamicin.

CHROMATOGRAPHIC CONDITIONS

(a) Use a silica gel precoated plate (Merck silica gel 60 plates are suitable).
(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, allow it to dry in air, spray with *ninhydrin solution R1* and heat at 105° for 2 minutes.

MOBILE PHASE

The lower layer obtained by shaking together equal volumes of 13.5M *ammonia*, *chloroform* and *methanol* and allowing to separate.

CONFIRMATION

The three principal spots in the chromatogram obtained with solution (1) correspond to the three principal spots in the chromatogram obtained with solution (2).

B. In the test for Composition of gentamicin sulfate, the retention times of the four principal peaks in the chromatogram obtained with solution (1) correspond to those of the four principal peaks in the chromatogram obtained with solution (2).

TESTS

Composition of gentamicin sulfate

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

(1) Disperse a quantity of the cream containing the equivalent of 15 mg of gentamicin in 10 mL of *chloroform*, add 10 mL of a 0.25% w/v solution of *sodium tetraborate*, shake vigorously, centrifuge and separate the aqueous layer. Repeat the extraction with two 5 mL quantities of the sodium tetraborate solution, dilute the combined aqueous extracts to 25 mL with the same solution and filter. To 10 mL of the clear filtrate add 5 mL of *methanol*, swirl, add 4 mL of *phthalaldehyde reagent*, mix, add sufficient *methanol* to produce 25 mL, heat in a water bath at 60° for 15 minutes and cool. If the solution is not used immediately, cool to 0° and use within 4 hours.
(2) Prepare in the same manner as solution (1) but using 10 mL of a 0.065% w/v solution of *gentamicin sulfate* *BPCRS* in place of the preparation being examined and beginning at the words 'To 10 mL of the clear filtrate …'.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (12.5 cm × 4.6 mm) packed with *end-capped octadecylsilyl silica gel for chromatography* (5 µm) (Hypersil ODS and Kromasil C18 are suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1.5 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 330 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

0.025M *sodium heptanesulfonate monohydrate* in a mixture of 5 volumes of *glacial acetic acid*, 25 volumes of *water* and 70 volumes of *methanol*.

When the chromatograms are recorded under the prescribed conditions the retention time of component C_2 is 10 to 20 minutes. The retention times relative to component C_2 are: about 0.13 (reagent); about 0.27 (component C_1); about 0.65 (component C_{1a}); about 0.85 (component C_{2a}).

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (2), the *resolution factor* between the peaks due to components C_{2a} and C_2 is at least 1.3.

LIMITS

Using the chromatogram obtained with solution (1) calculate the percentage content of components C_1, C_{1a}, C_2 and C_{2a} in the cream by *normalisation*. The proportions are within the following limits:

C_1, 25.0 to 50.0%;

C_{1a}, 10.0 to 35.0%;

C_2 plus C_{2a}, 25.0 to 55.0%.

ASSAY

Dissolve as completely as possible a quantity of the cream containing the equivalent of 3 mg of gentamicin in 20 mL of *chloroform*, shake vigorously with 75 mL of *phosphate buffer pH 8.0* and allow to separate. Dilute 10 mL of the aqueous layer to 50 mL with *phosphate buffer pH 8.0*. 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.

Calculate the content of gentamicin in the cream, taking each 1000 IU found to be equivalent to 1 mg of gentamicin. The upper fiducial limit of error is not less than 90.0% and the lower fiducial limit of error is not more than 120.0% of the stated content.

LABELLING

The quantity of active ingredient is stated in terms of the equivalent amount of gentamicin.