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

Betamethasone Valerate Cream

General Notices

Action and use

Glucocorticoid.

DEFINITION

Betamethasone Valerate Cream contains Betamethasone Valerate in a suitable basis.

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

Content of betamethasone, $C_{22}H_{29}FO_5$

90.0 to 110.0% of the stated amount.

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 0.5 mg of betamethasone in 20 mL of *methanol (80%)* by heating on a water bath until the methanol begins to boil. Shake vigorously, cool in ice for 30 minutes and centrifuge. Mix 10 mL of the supernatant liquid with 3 mL of *water* and 5 mL of *chloroform*, shake vigorously, allow the layers to separate and evaporate the chloroform layer to dryness in a current of nitrogen with gentle heating. Dissolve the residue in 1 mL of *chloroform*.
(2) 0.03% w/v of *betamethasone valerate BPCRS* in *chloroform*.
(3) A mixture of equal volumes of solutions (1) and (2).

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel G*.
(b) Use the mobile phase as described below.
(c) Apply 10 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry in air until the solvent has evaporated, heat at 105° for 5 minutes and spray while hot with *alkaline tetrazolium blue solution*.

MOBILE PHASE

5 volumes of *absolute ethanol*, 10 volumes of *acetone* and 100 volumes of *chloroform*.

CONFIRMATION

The principal spot in the chromatogram obtained with solution (1) corresponds in position and colour to that in the chromatogram obtained with solution (2). The spot in the chromatogram obtained with solution (3) appears as a single compact spot.

B. In the Assay, the chromatogram obtained with solution (2) shows a peak with the same retention time as the peak due to betamethasone valerate in the chromatogram obtained with solution (3).

ASSAY

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

(1) Shake a quantity of the cream containing the equivalent of 2 mg of betamethasone with 100 mL of hot *hexane* for 2 minutes, cool, extract the mixture with 20 mL of *ethanol (96%)* and filter the lower, ethanolic layer through absorbent cotton previously washed with *ethanol (75%)*. Repeat the extraction of the hexane mixture with two 10-mL quantities of *ethanol (75%)*, filtering each extract in turn through the absorbent cotton. Combine the filtrates, add 5 mL of a 0.072% w/v solution of *beclometasone dipropionate BPCRS* (internal standard) and dilute to 50 mL with *ethanol (75%)*.
(2) Shake a quantity of the cream containing the equivalent of 2 mg of betamethasone with 100 mL of hot *hexane* for 2 minutes, cool, extract the mixture with 20 mL of *ethanol (96%)* and filter the lower, ethanolic layer through absorbent cotton previously washed with *ethanol (75%)*. Repeat the extraction of the hexane mixture with two 10-mL quantities of *ethanol (75%)*, filtering each extract in turn through the absorbent cotton and dilute the combined filtrates to 50 mL with *ethanol (75%)*.
(3) Mix 10 mL of a solution containing 0.024% w/v of *betamethasone valerate BPCRS* and 0.0012% w/v of *betamethasone 21-valerate BPCRS* in *ethanol (80%)* with 5 mL of a 0.072% w/v solution of *beclometasone dipropionate BPCRS* (internal standard) in *ethanol (80%)* and dilute to 50 mL with the same solvent.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (10 cm × 5 mm) packed with *octadecylsilyl silica gel for chromatography* (5 µm) (Spherisorb ODS 1 is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 2 mL per minute.
(d) Use a column temperature of 60°.
(e) Use a detection wavelength of 238 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

42 volumes of *absolute ethanol* and 58 volumes of *water*.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the *resolution factor* between the peaks due to betamethasone valerate (retention time about 5 minutes) and betamethasone 21-valerate (retention time about 7 minutes) is greater than 1.0. If necessary, adjust the mobile phase.

DETERMINATION OF CONTENT

Calculate the content of $C_{22}H_{29}FO_5$ in the cream using the declared content of $C_{22}H_{29}FO_5$, in *betamethasone valerate BPCRS*.

STORAGE

Betamethasone Valerate Cream should be protected from light.

LABELLING

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