Prednisolone tablets (Prednisoloni compressi)

Category. Adrenal hormone.

Additional information. Strengths in the current WHO Model list of essential medicines: 5 mg, 25 mg. Strengths in the current WHO Model list of essential medicines for children: 5 mg, 25mg.

Requirements

Comply with the monograph for *Tablets*.

Prednisolone tablets contain not less than 90.0% and not more than 110.0% of the amount of $C_{21}H_{28}O_5$ stated on the label.

Identity tests

-Either test A alone or tests B and C may be applied.

To a quantity of the powdered tablets equivalent to about 0.05 g of Prednisolone add 10 mL of acetone R, shake and filter. Evaporate the filtrate to dryness and use the residue for the "Identity tests" and "Related substances".

A. Carry out the examination with the residue as described under *1.7 Spectrophotometry in the infrared region*. The infrared absorption spectrum is concordant with the spectrum obtained from prednisolone RS or with the *reference spectrum* of prednisolone.

B. Carry out the test as described under *1.14.1 Chromatography*, Thin-layer chromatography using kieselguhr R1 as the coating substance and a mixture of 9 volumes of acetone R and 1 volume of formamide R to impregnate the plate, dipping it about 5 mm into the liquid. After the solvent has reached a height of at least 16 cm remove the plate from the chromatographic chamber and allow it to stand at room temperature until the solvent has completely evaporated. Use the impregnated plate within 2 hours, carrying out the chromatography in the same direction as the impregnation. Use chloroform R as the mobile phase. Apply separately to the plate 2 µl of each of 2 solutions in a mixture of 9 volumes of chloroform R and 1 volume of methanol R containing (A) 2.5 mg of the residue per mL, and (B) 2.5 mg of prednisolone RS per mL. Develop the plate for a distance of 15 cm. After removing the plate from the chromatographic chamber allow it to dry in air until the solvents have evaporated, heat at 120 °C for 15 minutes and spray the hot plate with sulfuric acid/ethanol TS. Heat at 120 °C for a further 10 minutes, allow to cool and examine the chromatogram in daylight and in ultraviolet light (365 nm).

The principal spot obtained with solution A corresponds in position, appearance and intensity with that obtained with solution B.

C. To 5 mg of the residue add 1.0 mL of ethanol (~750 g/l) TS and shake. Then add 1.0 mL of potassiocupric tartrate TS and heat to boiling; an orange precipitate is produced slowly.

Related substances

Carry out the test as described under *1.14.1 Chromatography*, Thin-layer chromatography using silica gel R2 as the coating substance and a mixture of 77 volumes of dichloromethane R, 15 volumes of ether R, 8 volumes of methanol R and 1.2 volumes of water as the mobile phase. Apply separately to the plate 1 µl of each of 2 solutions in a mixture of 9 volumes of chloroform R and 1 volume of methanol R containing (A) 15 mg of the residue per mL and (B) 0.30 mg of the residue per mL. After removing the plate from the chromatographic chamber allow it to dry in air until the solvents have evaporated and heat at 105 °C for 10 minutes. Cool and examine the chromatogram in ultraviolet light (254 nm).

Any spot obtained with solution A, other than the principal spot, is not more intense than that obtained with solution B.

Assay

Weigh and powder 20 tablets. To a quantity of the powdered tablets equivalent to about 20 mg of Prednisolone, add 15 mL of water, shake with four quantities, each of 25 mL, of chloroform R, and filter the chloroform layer through cotton wool previously washed with chloroform R. Add sufficient chloroform R to the filtrate to produce 250 mL and dilute 25 mL to 100 mL with the same solvent. Transfer 10 mL of the resulting solution to a glass-stoppered, 50 mL conical flask, carefully evaporate to dryness and dissolve the residue in 20 mL of dehydrated ethanol R. Transfer 20 mL of dehydrated ethanol R to a similar flask to serve as the blank. To each of the flasks add 2.0 mL of blue tetrazolium/ethanol TS and mix. Then add to each flask 2.0 mL of tetramethylammonium hydroxide/ethanol TS, mix and allow to stand in the dark for 90 minutes. Measure the absorbance of a 1 cm layer at the maximum at about 525 nm against a solvent cell containing the blank.

Calculate the percentage content of $C_{21}H_{28}O_5$ by comparison with prednisolone RS, similarly and concurrently examined.

Uniformity of content

For tablets containing 1mg of Prednisolone. Individually transfer 10 powdered tablets to 10 separate 100 mL volumetric flasks,

add 50ml of ethanol (~750 g/l) TS, shake and dilute to volume with the same solvent.

For tablets containing 5mg of Prednisolone. Individually transfer 10 powdered tablets to 10 separate 100 mL volumetric flasks, add 50ml of ethanol (~750 g/l) TS, shake and dilute to volume with the same solvent. Dilute 2.0 mL to 10 mL with ethanol (~750 g/l) TS. Measure the absorbance of a 1 cm layer of the solutions at the maximum at about 242 nm.

Calculate the tablet content of $C_{21}H_{28}O_5$ in mg by comparison with prednisolone RS. The tablets comply with the test for *5.1 Uniformity of content for single-dose preparations*.