Pethidine hydrochloride tablets (Pethidini hydrochloridi compressi)

Category. Opioid analgesic.

Requirements

Comply with the monograph for Tablets.

Pethidine hydrochloride tablets contain not less than 90.0% and not more than 110.0% of the amount of C_{15}H_{21}NO_2.HCl stated on the label.

Identity tests

- Either tests A and D or tests B, C and D may be applied.

A. To a quantity of the powdered tablets equivalent to about 0.05 g of Pethidine hydrochloride add 20 mL of chloroform R, shake and filter. Evaporate the filtrate to dryness and dry the residue under reduced pressure (not exceeding 0.6 kPa or 5 mm of mercury). 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 reference spectrum of pethidine hydrochloride.

B. To a quantity of the powdered tablets equivalent to about 0.2 g of Pethidine hydrochloride add 20 mL of water, shake and filter. To 5 mL of the filtrate (keep the remaining filtrate for tests C and D) add 5 mL of trinitrophenol/ethanol TS and shake; a yellow, crystalline precipitate is produced. Filter, wash with water and dry the crystals at 105 °C for 2 hours; melting temperature, about 190 °C.

C. Evaporate 1 mL of the filtrate from test B to dryness on a water-bath, digest the residue in 1 mL of formaldehyde/sulfuric acid TS and heat gently; the colour of the solution changes to pink, changing to violet-red and showing a red fluorescence when held in front of a strong light.

D. Dilute 5 mL of the filtrate from test B with 5 mL of water; it yields the reactions described under 2.1 General identification tests as characteristic of chlorides.

Related substances

Carry out the test as described under 1.14.1 Thin-layer chromatography using kieselguhr R1 as the coating substance and a mixture of 9 volumes of acetone R and 1 volume of 2-phenoxyethanol 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 dry it in a current of air. Use the impregnated plate immediately, carrying out the chromatography in the same direction as the impregnation.

Shake together 100 volumes of light petroleum R1, 8 volumes of 2-phenoxyethanol R and 1 volume of diethylamine R, allow to settle and use this solution as the mobile phase. Apply separately to the plate 5 μl of each of the following 2 solutions. For solution (A) shake a quantity of the powdered tablets equivalent to about 0.1 g of Pethidine hydrochloride with 5 mL of water, filter, shake the filtrate with 0.5 mL of sodium hydroxide (~200 g/l) TS and 2 mL of ether R, allow the layers to separate and use the upper layer. For solution (B) dilute 0.5 mL of solution A to 50 mL with ether R. After removing the plate from the chromatographic chamber allow it to dry in air for 10 minutes, return it to the chromatographic chamber and repeat the development. Remove the plate, allow it to dry in air for 10 minutes and spray with dichlorofluorescein TS. Allow to stand for 5 minutes and spray with water until the background is white to pale yellow.

Examine the chromatogram in daylight. The chromatogram shows red to orange spots. Any spot obtained with solution A, other than the principal spot, is not more intense than that obtained with solution B.

Examine the chromatogram without delay in ultraviolet light (365 nm). The chromatogram shows spots with intense yellow fluorescence. 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 0.5 g of Pethidine hydrochloride add 40 mL of water, 2.0 mL of sodium hydroxide (~200 g/l) TS and extract immediately with quantities of 25 mL, 10 mL and 10 mL of chloroform R. Wash each extract with the same 15 mL of water and filter into a dry flask. To the combined extracts, which should be clear and free from droplets of water, add 0.15 mL of 1-naphtholbenzein/acetic acid TS and titrate with perchloric acid (0.05 mol/l) VS as described under 2.6 Non-aqueous titration, Method A.

Each mL of perchloric acid (0.05 mol/l) VS is equivalent to 14.19 mg of C_{15}H_{21}NO_2.HCl.