layer to an oily residue on a water-bath. Dissolve the oily residue in *2-propanol R* and dilute to 10.0 ml with the same solvent.

Reference solution (c). Dilute 1.0 ml of the test solution to 50 ml with *2-propanol R*.

Column:

– *size*: *l* = 0.25 m, Ø = 4.6 mm;

– *stationary phase*: *amylose derivative of silica gel for chromatography R*.

Mobile phase: *diethylamine R, 2-propanol R, hexane R* (3:20:980 *V/V/V*).

Flow rate: 1 ml/min.

Detection: spectrophotometer at 254 nm.

Injection: 10 µl.

Under these conditions the peak of the (*S*)-isomer appears first.

System suitability:

– *resolution*: minimum 1.5 between the peaks due to the (*R*)-enantiomer and to the (*S*)-enantiomer in the chromatogram obtained with reference solution (b);

– the retention times of the principal peaks in the chromatograms obtained with the test solution and reference solution (a) are identical ((*S*)-enantiomer).

Limits:

– *(R)-enantiomer*: not more than the area of the principal peak in the chromatogram obtained with reference solution (c) (2 per cent);

– *any other impurity*: for each impurity, not more than 0.25 times the area of the principal peak in the chromatogram obtained with reference solution (c) (0.5 per cent).

Heavy metals (*2.4.8*): maximum 20 ppm.

1.0 g complies with test C. Prepare the reference solution using 2 ml of *lead standard solution (10 ppm Pb) R*.

Loss on drying (*2.2.32*): maximum 0.5 per cent, determined on 1.000 g by drying in an oven at 65 °C for 4 h.

Sulphated ash (*2.4.14*): maximum 0.1 per cent, determined on 1.0 g.

ASSAY

Dissolve 0.150 g in 25 ml of *anhydrous acetic acid R*. Titrate with *0.1 M perchloric acid*, determining the end-point potentiometrically (*2.2.20*).

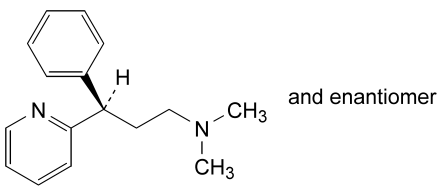
1 ml of *0.1 M perchloric acid* is equivalent to 19.54 mg of $C_{20}H_{23}ClN_2O_4$.

STORAGE

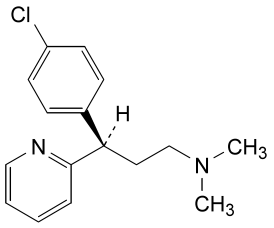
Protected from light.

IMPURITIES

Specified impurities: A, B.



A. (3*RS*)-*N,N*-dimethyl-3-phenyl-3-(pyridin-2-yl)propan-1-amine,

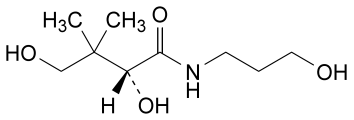


B. (3*R*)-3-(4-chlorophenyl)-*N,N*-dimethyl-3-(pyridin-2-yl)propan-1-amine.

01/2008:0761

DEXPANTHENOL

Dexpanthenolum



$C_9H_{19}NO_4$ M_r 205.3

[81-13-0]

DEFINITION

Dexpanthenol contains not less than 98.0 per cent and not more than the equivalent of 101.0 per cent of (2*R*)-2,4-dihydroxy-*N*-(3-hydroxypropyl)-3,3-dimethylbutanamide, calculated with reference to the anhydrous substance.

CHARACTERS

A colourless or slightly yellowish, viscous hygroscopic liquid, or a white or almost white, crystalline powder, very soluble in water, freely soluble in ethanol (96 per cent).

IDENTIFICATION

First identification: A, B.

Second identification: A, C, D.

A. It complies with the test for specific optical rotation (see Tests).

B. Examine by infrared absorption spectrophotometry (*2.2.24*), comparing with the spectrum obtained with *dexpanthenol CRS*. Examine the substances using discs prepared as follows: dissolve the substance to be examined and the reference substance separately in 1.0 ml of *anhydrous ethanol R* to obtain a concentration of 5 mg/ml. Place dropwise 0.5 ml of this solution on a disc of *potassium bromide R*. Dry the disc at 100-105 °C for 15 min.

C. Examine the chromatograms obtained in the test for 3-aminopropanol. The principal spot in the chromatogram obtained with test solution (b) is similar in position, colour and size to the principal spot in the chromatogram obtained with reference solution (a).

D. To 1 ml of solution S (see Tests) add 1 ml of *dilute sodium hydroxide solution R* and 0.1 ml of *copper sulphate solution R*. A blue colour develops.

TESTS

Solution S. Dissolve 2.500 g in *carbon dioxide-free water R* and dilute to 50.0 ml with the same solvent.

Appearance of solution. Solution S is clear (*2.2.1*) and not more intensely coloured than reference solution B_6 (*2.2.2, Method II*).

pH (*2.2.3*). The pH of solution S is not greater than 10.5.

Specific optical rotation (*2.2.7*). The specific optical rotation is + 29.0 to + 32.0, determined on solution S and calculated with reference to the anhydrous substance.

3-Aminopropanol. Examine by thin-layer chromatography (*2.2.27*), using *silica gel G R* as the coating substance.

Test solution (a). Dissolve 0.25 g of the substance to be examined in *anhydrous ethanol R* and dilute to 5 ml with the same solvent.

Test solution (b). Dilute 1 ml of test solution (a) to 10 ml with *anhydrous ethanol R*.

Reference solution (a). Dissolve the contents of a vial of *dexpanthenol CRS* in 1.0 ml of *anhydrous ethanol R* to obtain a concentration of 5 mg/ml.

Reference solution (b). Dissolve 25 mg of *3-aminopropanol R* in *anhydrous ethanol R* and dilute to 100 ml with the same solvent.

Apply separately to the plate 10 µl of each solution. Develop over a path of 15 cm using a mixture of 20 volumes of *concentrated ammonia R*, 25 volumes of *methanol R* and 55 volumes of *butanol R*. Allow the plate to dry in air, spray with a 100 g/l solution of *trichloroacetic acid R* in *methanol R* and heat at 150 °C for 10 min. Spray with a 1 g/l solution of *ninhydrin R* in *methanol R* and heat at 120 °C until a colour appears. Any spot due to 3-aminopropanol in the chromatogram obtained with test solution (a) is not more intense than the spot in the chromatogram obtained with reference solution (b) (0.5 per cent).

Heavy metals (*2.4.8*). 12 ml of solution S complies with limit test A for heavy metals (20 ppm). Prepare the reference solution using *lead standard solution (1 ppm Pb) R*.

Water (*2.5.12*). Not more than 1.0 per cent, determined on 1.000 g.

Sulphated ash (*2.4.14*). Not more than 0.1 per cent, determined on 1.0 g.

ASSAY

To 0.400 g add 50.0 ml of *0.1 M perchloric acid*. Boil under a reflux condenser for 5 h protected from humidity. Allow to cool. Add 50 ml of *dioxan R* by rinsing the condenser, protected from humidity. Add 0.2 ml of *naphtholbenzein solution R* and titrate with *0.1 M potassium hydrogen phthalate* until the colour changes from green to yellow. Carry out a blank titration.

1 ml of *0.1 M perchloric acid* is equivalent to 20.53 mg of $C_9H_{19}NO_4$.

STORAGE

In an airtight container.

01/2008:1506
corrected 6.0

DEXTRAN 1 FOR INJECTION

Dextranum 1 ad iniectabile

DEFINITION

Low molecular weight fraction of dextran, consisting of a mixture of isomaltooligosaccharides.

Average relative molecular mass: about 1000.

PRODUCTION

It is obtained by hydrolysis and fractionation of dextrans produced by fermentation of sucrose using *Leuconostoc mesenteroides* strain NRRL B-512 = CIP 78.59 or substrains thereof (for example *L. mesenteroides* B-512 F = NCTC 10817).

It is prepared in conditions designed to minimise the risk of microbial contamination.

CHARACTERS

Appearance: white or almost white powder, hygroscopic.

Solubility: very soluble in water, very slightly soluble in ethanol (96 per cent).

IDENTIFICATION

A. Dissolve 3.000 g in *water R*, heat on a water-bath and dilute to 100.0 ml with the same solvent. The specific optical rotation (*2.2.7*) is + 148 to + 164, calculated with reference to the dried substance. Dry an aliquot of the solution first on a water-bath and then to constant weight *in vacuo* at 70 °C. Calculate the dextran content after correction for the content of sodium chloride.

B. Infrared absorption spectrophotometry (*2.2.24*).

Preparation: to 1-2 mg add 1 or a few drops of *water R*. Grind in an agate mortar for 1-2 min. Add about 300 mg of *potassium bromide R* and mix to a slurry but do not grind. Dry *in vacuo* at 40 °C for 15 min. Crush the residue. If it is not dry, dry for another 15 min. Prepare a disc using *potassium bromide R*.

Comparison: repeat the operations using *dextran 1 CRS*.

Blank: run the infrared spectrum with a blank disc using *potassium bromide R* in the reference beam.

C. Molecular-mass distribution (see Tests).

TESTS

Solution S. Dissolve 7.5 g in *carbon dioxide-free water R*, heat on a water-bath and dilute to 50 ml with the same solvent.

Absorbance (*2.2.25*): maximum 0.12, determined at 375 nm on solution S.

Acidity or alkalinity. To 10 ml of solution S add 0.1 ml of *phenolphthalein solution R*. The solution is colourless. Add 0.2 ml of *0.01 M sodium hydroxide*. The solution is pink. Add 0.4 ml of *0.01 M hydrochloric acid*. The solution is colourless. Add 0.1 ml of *methyl red solution R*. The solution is red or orange.

Nitrogen-containing substances: maximum 110 ppm of N.

Carry out the determination of nitrogen by sulphuric acid digestion (*2.5.9*), using 0.200 g and heating for 2 h. Collect the distillate in a mixture of 0.5 ml of *bromocresol green solution R*, 0.5 ml of *methyl red solution R* and 20 ml of *water R*. Titrate with *0.01 M hydrochloric acid*. Not more than 0.15 ml of *0.01 M hydrochloric acid* is required to change the colour of the indicator.

Sodium chloride: maximum 1.5 per cent.

Accurately weigh 3-5 g and dissolve in 100 ml of *water R*. Add 0.3 ml of *potassium chromate solution R* and titrate with *0.1 M silver nitrate* until the yellowish-white colour changes to reddish-brown.

1 ml of *0.1 M silver nitrate* is equivalent to 5.844 mg of NaCl.

Molecular-mass distribution. Size-exclusion chromatography (*2.2.30*).

Test solution. Dissolve 6.0-6.5 mg of the substance to be examined in 1.0 ml of the mobile phase.