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

Diethylcarbamazine Tablets

General Notices

Action and use

Antihelminthic.

DEFINITION

Diethylcarbamazine Tablets contain Diethylcarbamazine Citrate.

The tablets comply with the requirements stated under Tablets and with the following requirements.

Content of diethylcarbamazine citrate, $C_{10}H_{21}N_3O$, $C_6H_8O_7$

95.0 to 105.0% of the stated amount.

IDENTIFICATION

A. To a quantity of the powdered tablets containing 0.15 g of Diethylcarbamazine Citrate add 15 mL of *ethanol (96%)*, shake for 5 minutes, filter and evaporate the filtrate to dryness. To the residue add 10 mL of 2M *sodium hydroxide*, filter if necessary, and extract with three 10-mL quantities of *dichloromethane*. Dry the combined extracts over *anhydrous sodium sulfate*, filter and evaporate. The *infrared absorption spectrum* of the oily residue, Appendix II A, is concordant with the *reference spectrum* of diethylcarbamazine (*RS 411*).
B. In the test for related substances, the chromatogram obtained with solution (1) shows a peak with the same retention time as the peak due to citric acid in the chromatogram obtained with solution (3).

TESTS

Dissolution

Comply with the requirements for Monographs of the British Pharmacopoeia in the *dissolution test for tablets and capsules*, Appendix XII B1, using Apparatus 2. Use as the medium 900 mL of *water* and rotate the paddle at 50 revolutions per minute. Carry out the method for *liquid chromatography*, Appendix III D. Dissolve 31.24 g of *potassium dihydrogen orthophosphate* in *water*, add sufficient *water* to produce 1000 mL and mix (solution A). Solution (1) contains 0.0025% w/v of *diethylcarbamazine citrate BPCRS* in solution A.For solution (2) dilute 10 mL of the filtered dissolution medium with an equal volume of a 6.248% w/v solution of *potassium dihydrogen orthophosphate*, filter and dilute with solution A to produce a solution expected to contain about 0.0025% w/v of Diethylcarbamazine Citrate.

The chromatographic procedure described under Assay may be used.

Calculate the total content of diethylcarbamazine citrate, $C_{10}H_{21}N_3O,C_6H_8O_7$, in the medium using the declared content of $C_{10}H_{21}N_3O,C_6H_8O_7$ in *diethylcarbamazine citrate BPCRS*.

Dimethylpiperazine and methylpiperazine

Carry out the method for *thin-layer chromatography*, Appendix III A, using *silica gel G* as the coating substance and a mixture of 5 volumes of 13.5M *ammonia*, 30 volumes of *butan-2-one* and 65 volumes of *methanol* as the mobile phase. Allow the solvent front to ascend 12 cm above the line of application. Apply separately to the plate 20 µL of each of the following solutions. For solution (1) shake a quantity of the powdered tablets containing 0.50 g of Diethylcarbamazine Citrate with 20 mL of *methanol* and filter. For solution (2) dissolve 0.05 g of *diethylcarbamazine citrate BPCRS* in *methanol* and dilute to 2.0 mL with the same solvent. For solution (3) dissolve 10 mg of *methylpiperazine* in *methanol* and dilute to 200 mL with the same solvent. For solution (4) dissolve 10 mg of *dimethylpiperazine* in *methanol* and dilute to 200 mL with the same solvent. Dry the plate at 105° and expose to iodine vapour for 30 minutes. Any spots corresponding to methylpiperazine and dimethylpiperazine in the chromatogram obtained with solution (1) are not more intense than the spots in the chromatogram obtained with solutions (3) and (4) respectively (0.2% of each).

Related substances

Weigh and finely powder 20 tablets. Dissolve 31.24 g of *potassium dihydrogen orthophosphate* in *water*, add sufficient *water* to produce 1000 mL and mix (solution A). Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions. For solution (1) shake a quantity of the powdered tablets containing 0.3 g of Diethylcarbamazine Citrate in 100 mL of solution A, centrifuge and use the clear supernatant liquid. For solution (2) dilute 1 volume of solution (1) to 100 volumes with solution A and further dilute 1 volume of the resulting solution to 10 volumes with solution A to produce a solution containing 0.0003% w/v Diethylcarbamazine Citrate. Solution (3) contains 0.2% w/v of *citric acid* in solution A.

The chromatographic procedure described under Assay may be used.

The area of any *secondary peak* in the chromatogram obtained with solution (1) is not greater than the area of the principal peak in the chromatogram obtained with solution (2) (0.1%). Disregard any peak with the same retention time as citric acid in the chromatogram obtained with solution (1).

ASSAY

Weigh and finely powder 20 tablets. Dissolve 31.24 g of *potassium dihydrogen orthophosphate* in *water*, add sufficient *water* to produce 1000 mL and mix (solution A). Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions. For solution (1) dissolve a quantity of the powdered tablets containing 25 mg of Diethylcarbamazine Citrate in 100 mL of solution A, shake and filter. Dilute 10 volumes to 50 volumes with solution A. Solution (2) contains 0.005% w/v *diethylcarbamazine citrate BPCRS* in solution A.

The chromatographic procedure may be carried out using (a) a stainless steel column (15 cm x 3.9 mm) packed with *octadecylsilyl silica gel for chromatography* (5 µm) (Waters Symmetry is suitable), (b) as the mobile phase with a flow rate of 0.8 mL per minute a mixture of 100 mL of *methanol* and 900 mL of a solution containing 10 g of *potassium dihydrogen orthophosphate* in 1000 mL of *water* and (c) a detection wavelength of 220 nm.

Calculate the content of $C_{10}H_{21}N_3O,C_6H_8O_7$ in the tablets using the declared content of $C_{10}H_{21}N_3O,C_6H_8O_7$ in *diethylcarbamazine citrate BPCRS*.