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

Carbamazepine Oral Suspension

General Notices

Carbamazepine Oral Suspensions from different manufacturers, whilst complying with the requirements of the monograph, are not interchangeable, unless justified and authorised.

Action and use

Antiepileptic.

DEFINITION

Carbamazepine Oral Suspension is a suspension of Carbamazepine in a suitable vehicle.

PRODUCTION

A suitable dissolution test is carried out to demonstrate the appropriate release of Carbamazepine. The dissolution profile reflects the *in vivo* performance which in turn is compatible with the dosage schedule recommended by the manufacturer.

The oral suspension complies with the requirements stated under Oral Liquids and with the following requirements.

Content of carbamazepine, $C_{15}H_{12}N_2O$

95.0 to 105.0% of the stated amount.

IDENTIFICATION

To a quantity of the oral suspension containing 100 mg of Carbamazepine add 20 mL of 0.1M *sodium hydroxide* and extract with 3 successive 20-mL quantities of *dichloromethane*.Dry the combined extracts over *anhydrous sodium sulfate* and evaporate the *dichloromethane*.The *infrared absorption spectrum* of the residue, is concordant with the *reference spectrum* of carbamazepine (*RS 406*).

TESTS

Acidity

pH, 3.5 to 4.5, Appendix V L.

Related substances

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

(1) Shake, with the aid of ultrasound, a quantity of the oral suspension containing 0.2 g of Carbamazepine with 50 mL of *methanol*, cool and dilute to 100 mL with *water*.Centrifuge 10 mL of the solution, transfer 5 mL of the supernatant liquid to a 10-mL volumetric flask and dilute to volume with *methanol (50%)*.
(2) Dilute 1 volume of solution (1) to 50 volumes with *methanol (50%)* and dilute 1 volume of the resulting solution to 10 volumes with *methanol (50%)*.

(3) Dilute 5 mg each of *carbamazepine BPCRS* and *carbamazepine impurity A EPCRS* in *methanol (50%)* and dilute to 50 mL with the same solvent. Dilute 1.0 mL of the resulting solution to 50 mL with *methanol (50%)*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *nitrile silica gel for chromatography* (10 µm) (Nucleosil CN is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 2 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 230 nm.
(f) Inject 20 µL of each solution.
(g) Inject solution (1) and allow the chromatography to proceed for 10 times the retention time of carbamazepine.

MOBILE PHASE

30 volumes of *tetrahydrofuran*, 120 volumes of *methanol* and 850 volumes of *water*, adding 0.2 volumes of *anhydrous formic acid* and 0.5 volumes of *trimethylamine* to 1000 volumes of the solution.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the *resolution* between the peaks due to carbamazepine and carbamazepine impurity A is at least 1.7.

LIMITS

In the chromatogram obtained with solution (1):

the area of any *secondary peak* is not greater than the area of the principal peak in the chromatogram obtained with solution (2) (0.2%);

the sum of the areas of any *secondary peaks* is not more than 2.5 times the area of the peak due to carbamazepine in the chromatogram obtained with solution (2) (0.5%).

Disregard any peak with an area less than half the area of the peak due to carbamazepine in the chromatogram obtained with solution (2) (0.1%).

ASSAY

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

(1) Shake a weighed quantity of the oral suspension containing 0.2 g of Carbamazepine with 100 mL of *methanol* for 15 minutes. Dilute to 200 mL with *water*, mix, filter and further dilute 1 volume of the filtrate to 5 volumes with *methanol (50%)*.
(2) Prepare a 0.2% w/v solution of *carbamazepine BPCRS* in *methanol* and dilute 1 volume of this solution to 2 volumes with *water*. Dilute 1 volume of the resulting solution to 5 volumes with *methanol (50%)*.
(3) 5 mg each of *carbamazepine BPCRS* and *carbamazepine impurity A EPCRS* in *methanol (50%)* and dilute to 50 mL with the same solvent. Dilute 1.0 mL of the resulting solution to 50 mL with *methanol (50%)*.

CHROMATOGRAPHIC CONDITIONS

The conditions described under Related substances may be used.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the *resolution* between the peaks due to carbamazepine and carbamazepine impurity A is at least 1.7.

DETERMINATION OF CONTENT

Determine the *weight per mL* of the oral suspension, Appendix V G, and calculate the content of $C_{15}H_{12}N_2O$, weight in volume, using the declared content of $C_{15}H_{12}N_2O$ in *carbamazepine BPCRS*.

IMPURITIES

The impurities limited by the requirements of this monograph include those listed under Carbamazepine.