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

# Nimodipine Tablets

General Notices

**Action and use**

Calcium channel blocker.

## DEFINITION

Nimodipine Tablets contain Nimodipine. They are coated.

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

**Content of nimodipine, $C_{21}H_{26}N_2O_7$**

95.0 to 105.0% of the stated amount.

*Carry out the following procedures protected from light or under long-wavelength light (greater than 420 nm). Prepare solutions immediately before use and protect them from light.*

## IDENTIFICATION

A. Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions.
(1) Shake a quantity of the powdered tablets containing 60 mg of Nimodipine with 10 mL of *ethyl acetate* for 15 minutes, centrifuge and use the supernatant liquid.
(2) 0.6% w/v solution of *nimodipine BPCRS* in *ethyl acetate*.
(3) A mixture of equal volumes of solution (1) and solution (2).

CHROMATOGRAPHIC CONDITIONS

(a) Use a silica gel precoated plate (Merck HPTLC silica gel 60 $F_{254}$ plates are suitable).
(b) Use the mobile phase as described below.
(c) Apply 2 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry in air and examine under *ultraviolet light (254 nm)*. Spray the plate with a freshly prepared 0.1% w/v solution of *2,6-dichloroquinonechlorimide* in *ethanol* and heat at 110° for about 3 minutes.

MOBILE PHASE

40 volumes of *ethyl acetate* and 60 volumes of *cyclohexane*.

CONFIRMATION

The spot due to nimodipine is greyish-violet.

The principal spot in the chromatogram obtained with solution (1) corresponds in position and colour to that in the chromatogram obtained with solution (2).

The principal spot in the chromatogram obtained with solution (3) appears as a single, compact spot.

B. In the Assay, the principal peak in the chromatogram obtained with solution (1) has the same retention time as the principal peak in the chromatogram obtained with solution (2).

## TESTS

### Dissolution

Comply with the requirements for Monographs of the British Pharmacopoeia in the *dissolution test for tablets and capsules*, Appendix XII B1.

TEST CONDITIONS

(a) Use Apparatus 2, rotating the paddle at 75 revolutions per minute.
(b) Use 900 mL of acetate buffer pH 4.5 prepared as described below containing 0.3% w/v of *sodium dodecyl sulfate* at a temperature of 37°, as the medium.
Prepare the buffer solution by dissolving 0.299 g of *sodium acetate* in 50 mL of *water*, add 0.174 g of *glacial acetic acid* and dilute to 100 mL with *water*.

PROCEDURE

(1) After 30 minutes withdraw a 10 mL sample of the medium and filter. Measure the *absorbance* of the filtrate, suitably diluted with the dissolution medium if necessary, at the maximum at 340 nm, Appendix II B using dissolution medium in the reference cell.
(2) Measure the *absorbance* of a suitable solution of *nimodipine BPCRS* using the dissolution medium in the reference cell.

DETERMINATION OF CONTENT

Calculate the total content of nimodipine, $C_{21}H_{26}N_2O_7$, in the medium from the absorbances obtained and using the declared content of $C_{21}H_{26}N_2O_7$ in *nimodipine BPCRS*.

LIMITS

The amount of nimodipine released is not less than 85% of the stated amount.

### Related substances

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

(1) Add 50 mL of *methanol* to a quantity of the powdered tablets containing 60 mg of Nimodipine, mix with the aid of ultrasound for 5 minutes, add sufficient *methanol* to produce 100 mL, centrifuge and use the supernatant liquid.
(2) Dilute 1 volume of solution (1) to 100 volumes with the mobile phase and dilute 2 volumes of this solution to 10 volumes with the mobile phase.
(3) 0.0003% w/v of *nimodipine impurity A BPCRS* in the mobile phase.
(4) 0.0002% w/v each of *nimodipine BPCRS* and *nimodipine impurity A BPCRS* in the mobile phase.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *octadecylsilyl silica gel for chromatography* (5 µm) (Lichrosorb RP-18 is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1.5 mL per minute.
(d) Use a column temperature of 40°.
(e) Use a detection wavelength of 235 nm.
(f) Inject 20 µL of each solution.

MOBILE PHASE

13 volumes of *acetonitrile*, 26 volumes of *tetrahydrofuran* and 60 volumes of *water*.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (4), the *resolution factor* between the peaks due to nimodipine and nimodipine impurity A is at least 1.5 and the *symmetry factor* of the peak due to nimodipine is not more than 2.0.

LIMITS

In the chromatogram obtained with solution (1):

the area of any peak corresponding to nimodipine impurity A is not greater than the area of the principal peak in the chromatogram obtained with solution (3) (0.5%);

the area of any other *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* other than any peak corresponding to impurity A is not greater than 2.5 times the area of the principal peak in the chromatogram obtained with solution (2) (0.5%).

Disregard any peak with an area less than 0.25 times the area of the principal peak in the chromatogram obtained with solution (2) (0.05%).

## ASSAY

Weigh and powder 20 tablets. Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions.

(1) Add 50 mL of *methanol* to a quantity of the powdered tablets containing 60 mg of Nimodipine, mix with the aid of ultrasound for 5 minutes, add sufficient *methanol* to produce 100 mL, centrifuge and use the supernatant liquid.
(2) 0.06% w/v of *nimodipine BPCRS* in *methanol*.
(3) 0.0002% w/v of *nimodipine BPCRS* and 0.0002% w/v of *nimodipine impurity A BPCRS* in *methanol*.

CHROMATOGRAPHIC CONDITIONS

The chromatographic 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 factor* between the peaks due to nimodipine and nimodipine impurity A is at least 1.5, and the *symmetry factor* of the peak due to nimodipine is not more than 2.0.

DETERMINATION OF CONTENT

Calculate the content of $C_{21}H_{26}N_2O_7$ in the tablets using the declared content of $C_{21}H_{26}N_2O_7$ in *nimodipine BPCRS*.

## IMPURITIES

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