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

Vecuronium Bromide for Injection

General Notices

Action and use

Non-depolarizing neuromuscular blocker.

DEFINITION

Vecuronium Bromide for Injection is a sterile material consisting of Vecuronium Bromide with or without excipients. It is supplied in a sealed container.

The contents of the sealed container comply with the requirements for Powders for Injections or Infusions stated under Parenteral Preparations and with the following requirements.

Content of vecuronium bromide, $C_{34}H_{57}BrN_2O_4$

93.0 to 105.0% of the stated amount.

IDENTIFICATION

A. Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions in *dichloromethane*.
(1) Shake the contents of the sealed container in a sufficient volume of *dichloromethane* to produce a solution containing 0.1% w/v of Vecuronium Bromide. Filter and use the filtrate.
(2) 0.1% w/v of *vecuronium bromide BPCRS*.
(3) 0.1% w/v each of *vecuronium bromide BPCRS* and *pancuronium bromide EPCRS*.

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel* (Merck silica gel plates are suitable).
(b) Use the mobile phase as described below.
(c) Apply 1 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry in air and spray with a 0.25% w/v solution of *iodine* in a mixture of equal volumes of *dichloromethane* and *methanol*.

MOBILE PHASE

Dissolve 1 g of *sodium bromide* in 5 mL of *water*. Add 85 mL of *propan-2-ol* and 10 mL of *acetonitrile*.

SYSTEM SUITABILITY

The test is not valid unless the chromatogram obtained with solution (3) shows two clearly separated spots.

CONFIRMATION

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

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

TESTS

Related substances

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions prepared immediately before use in a 0.02% w/v solution of *hydrochloric acid* in *methanol R1*.

(1) Dissolve the contents of a sealed container in a sufficient volume to produce a solution containing 0.04% w/v of Vecuronium Bromide.
(2) Dilute 1 volume of solution (1) to 200 volumes.
(3) 0.04% w/v of *vecuronium for system suitability EPCRS*.
(4) Dilute 1 volume of solution (2) to 5 volumes.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *end-capped octadecylsilyl silica gel for chromatography* (5 µm) (Hypersil C18 is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 2 mL per minute.
(d) Use a column temperature of 40°.
(e) Use a detection wavelength of 210 nm.
(f) Inject 100 µL of each solution.
(g) For solution (1), allow the chromatography to proceed for four times the retention time of vecuronium bromide.

MOBILE PHASE

135 volumes of 1.8% w/v *tetramethylammonium hydroxide* adjusted to pH 6.5 with *orthophosphoric acid*, 250 volumes of *methanol R1* and 615 volumes of *acetonitrile R1*.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the *resolution* between the peaks corresponding to vecuronium bromide and impurity E is at least 1.5.

LIMITS

Identify any peaks in the chromatogram obtained with solution (1) corresponding to impurity A and impurity C using the chromatogram obtained with solution (3). Multiply the area of any peak corresponding to impurity A and impurity C by the following correction factors respectively: 0.6 and 1.4.

In the chromatogram obtained with solution (1):

the area of any peak corresponding to impurity C is not greater than twice the area of the principal peak in the chromatogram obtained with solution (2) (1%);

the area of any other *secondary peak* is not greater than 0.6 times the area of the principal peak in the chromatogram obtained with solution (2) (0.3%);

the sum of the areas of any *secondary peaks* is not greater than four times the area of the principal peak in the chromatogram obtained with solution (2) (2%).

Disregard any peak with an area less than that of the principal peak in the chromatogram obtained with solution (4) (0.1%).

ASSAY

Determine the weight of the contents of 10 containers as described in the test for *uniformity of weight,* Appendix XII C1, Powders for Parenteral Use.

Carry out the method for *liquid chromatography*, Appendix III D, using the following solutions prepared immediately before use in a 0.02% w/v solution of *hydrochloric acid* in *methanol R1*.

(1) Dissolve a quantity of the mixed contents of the 10 containers containing 20 mg of Vecuronium Bromide in 100 mL.
(2) 0.02% w/v of *vecuronium bromide BPCRS*.
(3) 0.2% w/v of *vecuronium for system suitability EPCRS*.

CHROMATOGRAPHIC CONDITIONS

The chromatographic conditions described under Related substances may be used but with an injection volume of 20 µL.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the *resolution* between the peaks corresponding to vecuronium bromide and impurity E is at least 1.5.

DETERMINATION OF CONTENT

Calculate the content of $C_{34}H_{57}BrN_2O_4$ in a container of average content weight from the chromatograms obtained and from the declared content of $C_{34}H_{57}BrN_2O_4$ in *vecuronium bromide BPCRS*.

STORAGE

Vecuronium Bromide for Injection should be stored protected from light.

IMPURITIES

The impurities limited by the requirements of this monograph those listed under Vecuronium Bromide.