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

Diamorphine Injection

General Notices

Action and use

Opioid receptor agonist analgesic.

DEFINITION

Diamorphine Injection is a sterile solution of Diamorphine Hydrochloride in Water for Injections. It is prepared by dissolving Diamorphine Hydrochloride for Injection in the requisite amount of Water for Injections immediately before use.

The injection complies with the requirements stated under Parenteral Preparations.

STORAGE

Diamorphine Injection deteriorates on storage and should be used immediately after preparation.

DIAMORPHINE HYDROCHLORIDE FOR INJECTION

DEFINITION

Diamorphine Hydrochloride for Injection is a sterile material prepared from Diamorphine Hydrochloride 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 diamorphine hydrochloride, $C_{21}H_{23}NO_5,HCl,H_2O$

92.5 to 105.0% of the stated amount.

IDENTIFICATION

Dissolve a sufficient quantity of the contents of the sealed container in the minimum volume of *dichloromethane* and evaporate to dryness. The *infrared absorption spectrum* of the residue, Appendix II A, is concordant with the *reference spectrum* of diamorphine hydrochloride *(RS 093)*.

TESTS

6-*O*-Acetylmorphine

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

(1) Dissolve a quantity of the powder for injection containing 0.2 g of Diamorphine Hydrochloride in 10 mL of *water*.
(2) Dilute 1 volume of solution (1) to 20 volumes with *water*.
(3) Dilute 1 volume of solution (1) to 20 volumes with 0.01M *sodium hydroxide*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (12.5 cm × 4.6 mm) packed with *octylsilyl silica gel for chromatography* (5 µm) (Lichrospher RP-select B is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1 mL per minute.
(d) Use an ambient column temperature.
(e) Use a detection wavelength of 283 nm.
(f) Inject 20 µL of each solution.
When the chromatograms are recorded under the prescribed conditions, the retention time of diamorphine hydrochloride is about 20.3 minutes.

MOBILE PHASE

0.11% w/v of *sodium octanesulfonate* in a mixture of 10 volumes of *glacial acetic acid*, 10 volumes of *methanol*, 115 volumes of *acetonitrile* and 365 volumes of *water*.

SYSTEM SUITABILITY

The chromatogram obtained with solution (3) exhibits two *secondary peaks* with retention times relative to the principal peak of about 0.23 (morphine) and 0.43 (6-*O*-acetyl-morphine). The test is not valid unless the *resolution* between the peaks due to morphine and 6-*O*-acetyl-morphine is at least 2.0.

LIMITS

In the chromatogram obtained with solution (1):

the area of any peak corresponding to 6-*O*-acetylmorphine is not greater than the area of the peak in the chromatogram obtained with solution (2) (5%).

ASSAY

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

(1) Dissolve a quantity of the powder for injection containing 30 mg of Diamorphine Hydrochloride in 100 mL of *water* and filter.
(2) 0.03% w/v of *diamorphine hydrochloride BPCRS*.

CHROMATOGRAPHIC CONDITIONS

(a) Use a stainless steel column (25 cm × 4.6 mm) packed with *end-capped octadecylsilyl silica gel for chromatography* (5 µm) (Spherisorb ODS2 is suitable).
(b) Use isocratic elution and the mobile phase described below.
(c) Use a flow rate of 1 mL per minute.
(d) Use a column temperature of 30°.
(e) Use a detection wavelength of 260 nm.
(f) Inject 10 µL of each solution.
When the chromatograms are recorded under the prescribed conditions, the retention time of diamorphine hydrochloride is about 3.5 minutes.

MOBILE PHASE

45 volumes of *acetonitrile* and 55 volumes of 0.01M *sodium heptanesulfonate*, containing 0.0075M N,N-*dimethyloctylamine*, which has been adjusted to pH 3.0 with *orthophosphoric acid*.

DETERMINATION OF CONTENT

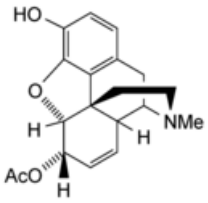
Calculate the content of $C_{21}H_{23}NO_5,HCl,H_2O$ in the injection using the declared content of $C_{21}H_{23}NO_5,HCl,H_2O$ in *diamorphine hydrochloride BPCRS*.

STORAGE

The sealed container should be protected from light.

IMPURITIES

The impurity limited by the requirements of this monograph is:



A. 6-*O*-Acetylmorphine.