



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

Sumatriptan Nasal Spray

[General Notices](#)

Action and use

Serotonin 5HT₁ receptor agonist; treatment of migraine.

DEFINITION

Sumatriptan Nasal Spray is a solution of Sumatriptan containing suitable buffering agents in a suitable container fitted with a suitable nasal delivery system.

The nasal spray complies with the requirements stated under Nasal Preparations and with the following requirements.

Content of sumatriptan, C₁₄H₂₁N₃O₂S

90.0 to 110.0% of the stated amount.

CHARACTERISTICS

A clear, pale to dark yellow solution.

IDENTIFICATION

To a volume of nasal spray containing 40 mg of Sumatriptan add 1 mL of [saturated sodium chloride solution](#) and 1 mL of [saturated sodium carbonate solution](#). Shake vigorously for 30 seconds, add two 2-mL quantities of [propan-2-ol](#), shake, allow to separate and discard the aqueous layer. The separation may take up to 24 hours. Evaporate under a stream of nitrogen and dry at 100°.

The [infrared absorption spectrum](#) is concordant with the *reference spectrum* of sumatriptan ([RS 414](#)).

TESTS

Acidity

pH, 5.0 to 6.0, [Appendix V L](#).

Impurities A and H

Carry out the method for [liquid chromatography, Appendix III D](#). Prepare the solutions in a mixture containing 3 volumes of 0.025M [sodium dihydrogen orthophosphate](#), the pH of which has been adjusted to 6.5 and 1 volume of [acetonitrile](#).

- (1) Dilute the nasal spray, if necessary, to contain 0.1% w/v of Sumatriptan.
- (2) Dilute 1 volume of solution (1) to 200 volumes.

(3) Dilute the contents of a vial of [sumatriptan for system suitability EPCRS](#) to 1 mL.

CHROMATOGRAPHIC CONDITIONS

- Use a stainless steel column (25 cm × 4.6 mm) packed with [silica gel for chromatography](#) (5 µm) (Spherisorb silica S5W is suitable).
- Use isocratic elution and the mobile phase described below.
- Use a flow rate of 2.0 mL per minute.
- Use an ambient column temperature.
- Use a detection wavelength of 282 nm.
- Inject 20 µL of each solution.
- Allow the chromatography to proceed for 5 times the retention time of the principal peak.

MOBILE PHASE

10 volumes of 10M [ammonium acetate](#) and 90 volumes of [methanol](#).

SYSTEM SUITABILITY

The test is not valid unless the chromatogram obtained with solution (3) resembles that supplied with [sumatriptan for system suitability EPCRS](#) and the [resolution](#) between impurity A and sumatriptan is at least 1.5.

LIMITS

Identify any peak in the chromatogram obtained with solution (1) due to impurity A using the chromatogram obtained with solution (3). Multiply the area of any peak corresponding to impurity A by a correction factor of 0.6.

In the chromatogram obtained with solution (1):

the area of any peak corresponding to impurity A is not greater than 3 times the area of the principal peak obtained in the chromatogram obtained with solution (2) (1.5%);

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

Related substances

Carry out the method for [liquid chromatography, Appendix III D](#). Prepare the solutions in a mixture containing 3 volumes of 0.025M [sodium dihydrogen orthophosphate](#), the pH of which has been adjusted to 6.5, and 1 volume of [acetonitrile](#).

- Dilute the nasal spray, if necessary, to contain 0.1% w/v of Sumatriptan.
- Dilute 1 volume of solution (1) to 100 volumes.
- Dilute the contents of a vial of [sumatriptan impurity mixture EPCRS](#) to 1 mL.
- Dilute 1 volume of solution (2) to 10 volumes.

CHROMATOGRAPHIC CONDITIONS

- Use a stainless steel column (25 cm × 4.6 mm) packed with [octadecylsilyl silica gel for chromatography](#) (5 µm) (Spherisorb ODS 1 is suitable).
- Use isocratic elution and the mobile phase below.
- Use a flow rate of 1.5 mL per minute.
- Use an ambient column temperature.
- Use a detection wavelength of 282 nm.
- Inject 20 µL of each solution.
- For solution (1) allow the chromatography to proceed for 4 times the retention time of the principal peak.

MOBILE PHASE

25 volumes of [acetonitrile](#) and 75 volumes of a solution containing 0.97 g of [dibutylamine](#), 0.735 g of [orthophosphoric acid](#) and 2.93 g of [sodium dihydrogen orthophosphate](#) in 750 mL [water](#), adjusted to pH to 6.5 with 10M [sodium hydroxide](#) and diluted to 1000 mL with [water](#).

When the chromatograms are recorded under the prescribed conditions the retention times relative to sumatriptan (retention time about 17 minutes) are: impurity D, about 0.2; impurity 2, about 0.3; impurity 1, about 0.4; impurity E, about 0.5; impurity B, about 0.6; impurity F, about 0.7 and impurity C, about 0.8.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (3), the [resolution](#) between the peaks due to impurity C and sumatriptan is at least 1.5.

LIMITS

Identify any peaks in the chromatogram obtained with solution (1) due to impurity 1 and impurity 2 using the reference chromatogram for [sumatriptan impurity standard BPCRS](#). Multiply the area of any peak corresponding to impurity 1 by a correction factor of 0.2 and multiply the area of any peak corresponding to impurity 2 by a correction factor of 0.3.

In the chromatogram obtained with solution (1):

the area of any peak corresponding to impurity 1 is not greater than 1.5 times the area of the principal peak in the chromatogram obtained with solution (2) (1.5%);

the area of any peak corresponding to impurity 2 is not greater than the area of the principal peak in the chromatogram obtained with solution (2) (1.0%);

the area of any other [secondary peak](#) is not greater than half of the area of the principal peak in the chromatogram obtained with solution (2) (0.5%).

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

The total impurity content in the test for Impurities A and H and the test for Related substances is not greater than 4.0%.

ASSAY

Carry out the method for [liquid chromatography, Appendix III D](#). Prepare the solutions in a mixture containing 3 volumes of 0.025M [sodium dihydrogen orthophosphate](#), the pH of which has been adjusted to 6.5, and 1 volume of [acetonitrile](#).

- (1) Dilute the nasal spray, if necessary, to contain 0.05% w/v of Sumatriptan.
- (2) 0.07% w/v of [sumatriptan succinate BPCRS](#).
- (3) Dilute the contents of a vial of [sumatriptan impurity mixture EPCRS](#) to 1 mL.

CHROMATOGRAPHIC CONDITIONS

The chromatographic procedure described under Related substances may be used.

SYSTEM SUITABILITY

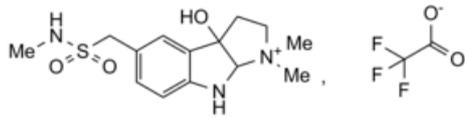
The test is not valid unless, in the chromatogram obtained with solution (3), the [resolution](#) between the peaks due to impurity C and sumatriptan is at least 1.5.

DETERMINATION OF CONTENT

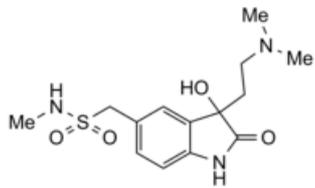
Calculate the content of $C_{14}H_{21}N_3O_2S$ using the declared content of $C_{14}H_{21}N_3O_2S, C_4H_6O_4$ in [sumatriptan succinate BPCRS](#). 1 mg of $C_{14}H_{21}N_3O_2S, C_4H_6O_4$ is equivalent to 0.714 mg of $C_{14}H_{21}N_3O_2S$.

IMPURITIES

The impurities limited by the requirements of this monograph include those listed under [Sumatriptan Succinate](#) and the following:



1. 3a-hydroxy-1,1-dimethyl-5-([methylamino]sulfonyl)methyl-1,2,3,3a,8,8a-hexahydropyrrolo[2,3-b]indol-1-ium trifluoroacetate];



2. 1-{3-[2-(dimethylnitroyl)ethyl]-1*H*-indol-5-yl]-*N*-methylmethanesulfonamide.