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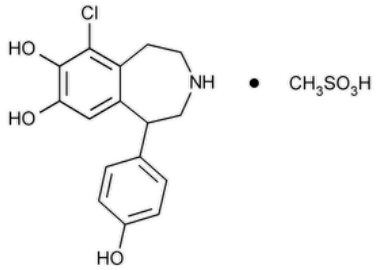
Fenoldopam Mesylate



$C_{16}H_{16}ClNO_3 \cdot CH_4SO_3$ 401.86

1*H*-3-Benzazepine-7,8-diol, 6-chloro-2,3,4,5-tetrahydro-1-(4-hydroxyphenyl)-, methanesulfonate (salt).

6-Chloro-2,3,4,5-tetrahydro-1-(*p*-hydroxyphenyl)-1*H*-3-benzazepine-7,8-diol methanesulfonate (salt) CAS RN®: 67227-57-0; UNII: HA3R0MY016.

» Fenoldopam Mesylate contains not less than 98.0 percent and not more than 102.0 percent of $C_{16}H_{16}ClNO_3 \cdot CH_4SO_3$, calculated on the anhydrous basis.

Packaging and storage—Preserve in tight containers, protected from moisture. Store at 25°, excursions permitted between 15° and 30°.

USP Reference standards ⟨11⟩—

USP Fenoldopam Mesylate RS
USP Fenoldopam Related Compound A RS

6-Chloro-1-(4-hydroxyphenyl)-3-methyl-2,3,4,5-tetrahydro-1*H*-benzo[*d*]azepine-7,8-diol hydrochloride (*N*-methyl-6-chloro-2,3,4,5-tetrahydro-1-(4-hydroxyphenyl)-1*H*-3-benzazepine-7,8-diol hydrochloride).

$C_{17}H_{19}ClNO_3 \cdot HCl$ 356.24

Identification—

Change to read:

A: ▲*Spectroscopic Identification Tests* ⟨197⟩, *Infrared Spectroscopy: 197K*▲ *(CN 1-May-2020)* ·

B: The retention time of the major peak in the chromatogram of the *Assay preparation* corresponds to that in the chromatogram of the *Standard preparation,* as obtained in the *Assay.*

Water Determination, *Method I* ⟨921⟩ **:** not more than 1.0%.

Residue on ignition ⟨281⟩**:** not more than 0.1%.

Limit of iodide—

Mobile phase—Prepare a filtered and degassed solution containing about 0.94 g of sodium bicarbonate, 0.952 g of sodium carbonate, 0.38 g of 4-cyanophenol, and 80 mL of acetonitrile in 4 L of water. Make adjustments if necessary (see *System Suitability* under *Chromatography* ⟨621⟩).

Standard stock solution—Transfer about 118.1 mg of sodium iodide, accurately weighed, to a 1000-mL volumetric flask. Dissolve in and dilute with water to volume, and mix to obtain a solution containing the equivalent of 100 µg of iodide per mL.

Standard solutions—Pipet 2.0 mL, 4.0 mL, 6.0 mL, and 8.0 mL of the *Standard stock solution* into separate 100-mL volumetric flasks, dilute with water to volume, and mix to obtain solutions having known concentrations of about 2 µg, 4 µg, 6 µg, and 8 µg of iodide per mL.

Test solution—Transfer about 300 mg of Fenoldopam Mesylate, accurately weighed, to a 100-mL volumetric flask. Dissolve in and dilute with water to volume, and mix.

Chromatographic system—The ion chromatograph is equipped with a conductivity detector, a 4-mm × 3.5-cm anion-exchange guard column, a 4-mm × 15-cm anion-exchange analytical column, and a micromembrane anion suppressor column. The flow rate is about 2.0 mL per minute. The regeneration solution for the suppressor column is a 0.050 M sulfuric acid solution, flowing at a rate of 5 mL per minute. Chromatograph the 6 µg per mL *Standard solution,* and record the peak responses as directed for *Procedure:* the relative standard deviation for replicate injections is not more than 5.0%.

Procedure—Separately inject equal volumes (about 100 µL) of each of the *Standard solutions* and the *Test solution* into the chromatograph, record the chromatograms, and measure the heights of peak responses. Plot the response of each of the *Standard solutions* versus the concentration, and draw the straight line best fitting the plotted points. From the graph so obtained, determine the quantity of iodide in the portion of Fenoldopam Mesylate taken: not more than 0.2% is found.

Related compounds—

Buffer solution, System suitability stock solution, and *System suitability solution*—Proceed as directed in the *Assay.*

Solution A—Use *Mobile phase* as prepared in the *Assay.*

Solution B—Use filtered and degassed methanol.

Mobile phase—Use variable mixtures of *Solution A* and *Solution B* as directed for *Chromatographic system.* Make adjustments if necessary (see *System Suitability* under *Chromatography ⟨621⟩*).

Test solution—Use the *System suitability stock solution*.

Chromatographic system—Proceed as directed in the *Assay,* except to program the chromatograph as follows.

Time (minutes)	*Solution A* (%)	*Solution B* (%)	Elution
0	100	0	equilibration
0–30	100	0	isocratic
30–60	100→70	0→30	linear gradient

Procedure—Inject a volume (about 20 µL) of the *Test solution* into the chromatograph, record the chromatogram, and measure the peak responses. Calculate the percentage of each impurity in the portion of Fenoldopam Mesylate taken by the formula:

$$100(r_i/r_s)$$

in which r_i is the peak response for each impurity; and r_s is the sum of the responses of all the peaks: not more than 0.3% of fenoldopam related compound A is found; not more than 0.1% of any other individual impurity is found; and not more than 1.0% of total impurities is found.

Limit of residual solvents—

Internal standard solution—Prepare a solution, in organic-free water, containing 10 mg of *n*-butanol per mL. Transfer 100 µL of this solution to a 10-mL volumetric flask, dilute with dimethylsulfoxide to volume, and mix.

Standard solution—Prepare a solution, in organic-free water, containing 10 mg each of *n*-propanol, isopropyl alcohol, and dimethylformamide per mL. Transfer 100 µL of this solution to a 10-mL volumetric flask, dilute with *Internal standard solution* to volume, and mix.

Test solution—Transfer about 50 mg of Fenoldopam Mesylate, accurately weighed, to a 1-mL volumetric flask. Dilute with *Internal standard solution* to volume, and sonicate to dissolve completely.

Chromatographic system (see *Chromatography ⟨621⟩*)—The gas chromatograph is equipped with a flame-ionization detector, a 0.32-mm × 30-m fused-silica capillary column coated with a 1.8-µm film of stationary phase G43, and a split injection system. The carrier gas is helium, flowing at a rate of about 1 mL per minute through the column and a split ratio of about 50:1. The injection port and the detector temperatures are maintained at 140° and 260°, respectively. The column temperature is programmed as follows. It is maintained for 12 minutes at 40°, then increased at a rate of 8° per minute to 120°, held for 0.1 minute, then increased at a rate of 25° per minute to 180°, and maintained at that temperature for 8 minutes.

Procedure—Separately inject equal volumes (about 1 µL) of the *Standard solution,* dimethylsulfoxide, and the *Test solution* into the chromatograph, record the chromatograms, and measure the peak areas. Identify, based on retention time, any peaks present in the chromatogram of the *Test solution.* Calculate the response factor, *F,* for each solvent in the *Standard solution* by the formula:

$$(W_R/W_I)(r_I/r_R)$$

in which W_R is the weight, in mg, of the solvent of interest; W_I is the weight, in mg, of the internal standard taken to prepare the *Internal standard solution;* and r_I and r_R are the peak responses for the internal standard and the solvent of interest, respectively, obtained from the *Standard solution.* Calculate the percentage, by weight, of each solvent found in the *Test solution* by the formula:

$$100FD(r_I/r_S)(W_I/W_D)$$

in which *F* is the average response factor for the solvent of interest obtained from all injections of the *Standard solution; D* is the dilution factor for the internal standard in the *Test solution* (i.e., 0.0001); r_I and r_S are the peak responses for the solvent of interest and the internal standard, respectively, obtained from the *Test solution;* W_I is the weight, in mg, of the internal standard taken to prepare the *Internal standard solution;* and W_D is the weight, in mg, of Fenoldopam Mesylate taken to prepare the *Test solution:* not more than 0.2% of total residual solvents is found.

Assay—

Buffer solution—Transfer about 16.33 g of monobasic potassium phosphate and 2 mL of triethylamine to a 2-L volumetric flask, and dissolve in 1800 mL of water. Adjust with phosphoric acid to a pH of 2.5, dilute with water to volume, and mix.

Mobile phase—Prepare a filtered and degassed mixture of *Buffer solution* and methanol (19:1). Make adjustments if necessary (see *System Suitability* under *Chromatography ⟨621⟩*).

System suitability stock solution—Transfer about 50 mg of Fenoldopam Mesylate, accurately weighed, to a 50-mL volumetric flask. With the aid of an ultrasonic bath, dissolve in and dilute with *Mobile phase* to volume, and mix.

System suitability solution—Transfer about 5 mg of USP Fenoldopam Related Compound A RS, accurately weighed, to a 50-mL volumetric flask. Add about 25 mL of *Mobile phase,* and sonicate to dissolve. Add 5 mL of the *System suitability stock solution,* dilute with *Mobile phase* to volume, and mix.

Standard preparation—Dissolve an accurately weighed quantity of USP Fenoldopam Mesylate RS in *Mobile phase* to obtain a solution having a known concentration of about 0.1 mg per mL.

Assay preparation—Transfer 5.0 mL of the *System suitability stock solution,* accurately measured, to a 50-mL volumetric flask, dilute with *Mobile phase* to volume, and mix.

Chromatographic system (see *Chromatography* ⟨621⟩)—The liquid chromatograph is equipped with a 225-nm detector and a 3.9-mm × 30-cm column that contains packing L11. The flow rate is about 1.7 mL per minute. Chromatograph the *System suitability solution,* and record the peak responses as directed for *Procedure:* the resolution, *R,* between fenoldopam and fenoldopam related compound A is not less than 1.5; the column efficiency is not less than 2000 theoretical plates; the tailing factor is not more than 1.3; and the relative standard deviation for replicate injections is not more than 2.0%.

Procedure—Separately inject equal volumes (about 20 µL) of the *Standard preparation* and the *Assay preparation* into the chromatograph, record the chromatograms, and measure the peak responses. Calculate the quantity, in mg, of $C_{16}H_{16}ClNO_3 \cdot CH_4SO_3$ in the portion of Fenoldopam Mesylate taken by the formula:

$$500C(r_U/r_S)$$

in which C is the concentration, in mg per mL, of USP Fenoldopam Mesylate RS in the *Standard preparation;* and r_U and r_S are the peak responses for fenoldopam obtained from the *Assay preparation* and the *Standard preparation,* respectively.

Auxiliary Information - Please check for your question in the FAQs before contacting USP.

Topic/Question	Contact	Expert Committee
FENOLDOPAM MESYLATE	Documentary Standards Support	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

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