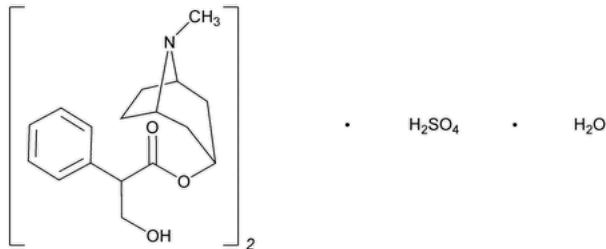


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Atropine Sulfate

Change to read:



$(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4 \cdot H_2O$ ▲694.84▲ (ERR 1-Jul-2020)
Anhydrous 676.82

Benzeneacetic acid, α -(hydroxymethyl)-, 8-methyl-8-azabicyclo[3.2.1]oct-3-yl ester, *endo*-(±)-, sulfate (2:1) (salt), monohydrate;
1 α H,5 α H-Tropan-3- α -ol (±)-tropate (ester), sulfate (2:1) (salt) monohydrate CAS RN®: 5908-99-6; UNII: 03J5ZE7KA5.
Anhydrous CAS RN®: 55-48-1; UNII: KAE4PSB0Z3.

DEFINITION

Atropine Sulfate contains NLT 98.0% and NMT 102.0% of atropine sulfate $[(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4]$, calculated on the anhydrous basis.

[CAUTION—Handle atropine sulfate with exceptional care, because it is highly potent.]

IDENTIFICATION

- **A. SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy:** 197K or 197A
- **B. IDENTIFICATION TESTS—GENERAL (191), Chemical Identification Tests, Sulfate**
Sample solution: 50 mg/mL
Acceptance criteria: Meets the requirements
- **C.** The retention time of the major peak of the *Sample solution* corresponds to that of the *System suitability solution*, as obtained in the Assay.

ASSAY

• **PROCEDURE**

Buffer: 1.8 g/L of [monobasic potassium phosphate](#) and 2.5 g/L of [sodium 1-pentanesulfonate](#), adjusted with [phosphoric acid](#) to a pH of 2.5
Diluent: [Acetonitrile](#) and *Buffer* (20:80)
Solution A: [Acetonitrile](#) and *Buffer* (5:95)
Solution B: [Acetonitrile](#) and *Buffer* (80:20)
Mobile phase: See [Table 1](#).

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	92	8
11	79	21
15	46	54
15.1	92	8
20	92	8

[NOTE—The gradient was established on an HPLC system with a dwell volume of approximately 0.8 mL.]

System suitability solution: 1 μ g/mL of [USP Hyoscyamine Related Compound A RS](#) and 0.5 mg/mL of [USP Atropine Sulfate RS](#) in *Diluent*.

Sensitivity solution: 0.25 μ g/mL of [USP Atropine Sulfate RS](#) in *Diluent*.

Standard solution: 0.5 mg/mL of [USP Atropine Sulfate RS](#) in *Diluent*

Sample solution: 0.5 mg/mL of Atropine Sulfate in *Diluent*

Chromatographic system

(See [Chromatography \(621\), System Suitability](#).)

Mode: LC

Detector: UV 210 nm

Column: 4.6-mm × 15-cm; 3-μm packing [L1](#)

Column temperature: 50°

Flow rate: 2 mL/min

Injection volume: 5 μL

System suitability

Samples: *System suitability solution*, *Sensitivity solution*, and *Standard solution*

[NOTE—See [Table 2](#) for the relative retention times.]

Suitability requirements

Resolution: NLT 1.4 between hyoscyamine related compound A and atropine, *System suitability solution*

Tailing factor: 0.8–1.8 for atropine, *System suitability solution*

Relative standard deviation: NMT 0.73%, *Standard solution*

Signal-to-noise ratio: NLT 10 for atropine, *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of atropine sulfate $[(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4]$ in the portion of Atropine Sulfate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times 100$$

r_U = peak response of atropine from the *Sample solution*

r_S = peak response of atropine from the *Standard solution*

C_S = concentration of [USP Atropine Sulfate RS](#) in the *Standard solution* (mg/mL)

C_U = concentration of Atropine Sulfate in the *Sample solution* (mg/mL)

Acceptance criteria: 98.0%–102.0% on the anhydrous basis

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.2%

• **ORGANIC IMPURITIES**

Buffer, Diluent, Solution A, Solution B, Mobile phase, System suitability solution, Sensitivity solution, Standard solution, Sample solution, Chromatographic system, and System suitability: Proceed as directed in the Assay.

Analysis

Sample: *Sample solution*

Calculate the percentage of each impurity in the portion of Atropine Sulfate taken:

$$\text{Result} = (r_U/r_T) \times (1/F) \times 100$$

r_U = peak response of each impurity from the *Sample solution*

r_T = sum of all the peak responses from the *Sample solution*

F = relative response factor for each impurity (see [Table 2](#))

Acceptance criteria: See [Table 2](#). The reporting threshold is 0.05%.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Tropic acid ^a	0.56	2.1	0.2
7-Hydroxyhyoscyamine ^b	0.66	1.0	0.2
Scopolamine ^c	0.72	1.0	0.2