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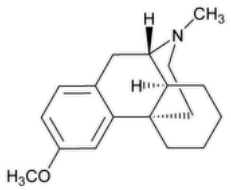
Dextromethorphan



$C_{18}H_{25}NO$ 271.40

Morphinan, 3-methoxy-17-methyl-, (9α,13α,14α)-;

3-Methoxy-17-methyl-9α,13α,14α-morphinan CAS RN®: 125-71-3; UNII: 7355X3ROTS.

DEFINITION

Dextromethorphan contains NLT 98.0% and NMT 101.0% of dextromethorphan ($C_{18}H_{25}NO$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

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

• **B.**

Buffer: 1.54 g of ammonium acetate in 1 L of water, adjusted with phosphoric acid to a pH of 4.1

Mobile phase: Methanol and *Buffer* (90:10)

Diluent: Methanol and water (90:10)

System suitability solution: 10 µg/mL of levomethorphan from USP Levomethorphan Solution RS and 10 mg/mL of USP Dextromethorphan RS in *Diluent*

Standard solution: 10 µg/mL of USP Dextromethorphan RS in *Diluent*

Sample solution: 10.0 mg/mL of Dextromethorphan in *Diluent*

Chromatographic system

(See *Chromatography ⟨621⟩, System Suitability*.)

Mode: LC

Detector: 225 nm

Column: 4.6-mm × 25-cm; 5-µm packing L88

Flow rate: 1 mL/min

Injection volume: 4 µL

System suitability

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

[Note—The relative retention times for dextromethorphan and levomethorphan are 1.0 and 1.28, respectively.]

Suitability requirements

Resolution: NLT 2.0 between dextromethorphan and levomethorphan, *System suitability solution*

Relative standard deviation: NMT 5.0% for dextromethorphan, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of levomethorphan in the portion of Dextromethorphan taken:

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

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

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

C_S = concentration of USP Dextromethorphan RS in the *Standard solution* (mg/mL)

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

Acceptance criteria: NMT 0.10%

ASSAY

• **Procedure**

Sample solution: Dissolve 700 mg of Dextromethorphan in 60 mL of glacial acetic acid, warming slightly, if necessary, to dissolve.

Titrimetric system

Mode: Direct titration

Titrant: 0.1 N perchloric acid VS

Endpoint detection: Visual

Analysis: Add 2 drops of crystal violet TS to the *Sample solution* and titrate with *Titrant* to a blue-green endpoint. Perform a blank determination and make any necessary correction. Each mL of 0.1 N perchloric acid is equivalent to 27.14 mg of dextromethorphan ($C_{18}H_{25}NO$).

Acceptance criteria: 98.0%–101.0% on the anhydrous basis

IMPURITIES

• **Residue on Ignition ⟨281⟩:** NMT 0.1%

• **Limit of Phenolic Compounds**

Sample: 10 mg of Dextromethorphan

Analysis: Dissolve the *Sample* in 2 mL of 3 N hydrochloric acid, add 2 drops of ferric chloride TS, and mix. Add 2 drops of potassium ferricyanide TS, and observe after 2 min.

Acceptance criteria: No blue-green color develops.

• **Limit of *N,N*-Dimethylaniline**

Standard solution: Transfer 50 mg of *N,N*-dimethylaniline to a 100-mL volumetric flask, add 70.0 mL of water, insert the stopper tightly, shake for 20 min using a mechanical wrist-action shaker or equivalent, and dilute with water to volume. Transfer 1.0 mL to a 100-mL volumetric flask, and dilute with water to volume. Transfer 1.0 mL of the resulting solution to a 25-mL volumetric flask, and add 19 mL of water.

Sample solution: Transfer 500 mg of Dextromethorphan to a 25-mL volumetric flask, add 19 mL of water and 1 mL of 3 N hydrochloric acid, dissolve by warming on a steam bath, and cool.

Analysis: Add 2 mL of 1 N acetic acid and 1 mL of sodium nitrite solution (1 in 100) to the *Sample solution* and dilute with water to volume. This solution shows no more color than the straw yellow to greenish yellow color of the *Standard solution* similarly treated.

Acceptance criteria: NMT 0.001% of *N,N*-dimethylaniline

SPECIFIC TESTS

• **Water Determination ⟨921⟩, *Method I, Method Ia*:** NMT 0.5%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers.

• **USP Reference Standards ⟨11⟩**

USP Dextromethorphan RS

USP Levomethorphan Solution RS

3-Methoxy-17-methylmorphinan.

$C_{18}H_{25}NO$ 271.40

This solution contains 0.1 mg/mL of levomethorphan in methanol.

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

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

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
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