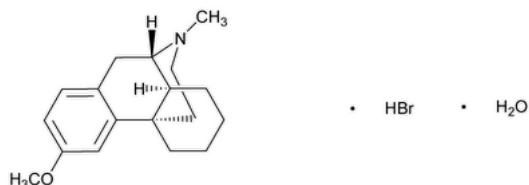


Status: Currently Official on 14-Feb-2025
 Official Date: Official as of 01-May-2020
 Document Type: USP Monographs
 DocId: GUID-184E42A9-D1CB-4ADB-9473-2149A60CD4AD_2_en-US
 DOI: https://doi.org/10.31003/USPNF_M24120_02_01
 DOI Ref: a1vpx

© 2025 USPC
 Do not distribute

Dextromethorphan Hydrobromide



$C_{18}H_{25}NO \cdot HBr \cdot H_2O$ 370.32

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

3-Methoxy-17-methyl-9 α ,13 α ,14 α -morphinan hydrobromide monohydrate CAS RN[®]: 6700-34-1; UNII: 9D2RTI9KYH.

Anhydrous CAS RN[®]: 125-69-9; UNII: Z0CG3115FG. 352.32

DEFINITION

Dextromethorphan Hydrobromide contains NLT 98.0% and NMT 102.0% of dextromethorphan hydrobromide ($C_{18}H_{25}NO \cdot HBr$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

- **A.** [▲ SPECTROSCOPIC IDENTIFICATION TESTS \(197\), Infrared Spectroscopy: 197K ▲](#) (CN 1-MAY-2020)

Sample: Dry under vacuum over silica for 4 h.

Acceptance criteria: Meets the requirements

- **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 μ g/mL of levomethorphan from [USP Levomethorphan Solution RS](#) and 10 mg/mL of [USP Dextromethorphan Hydrobromide RS](#) in *Diluent*

Standard solution: 10 μ g/mL of [USP Dextromethorphan Hydrobromide RS](#) in *Diluent*

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

Chromatographic system

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

Mode: LC

Detector: 225 nm

Column: 4.6-mm $\times$ 25-cm; 5- μ m packing L88

Flow rate: 1 mL/min

Injection volume: 4 μ L

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 Hydrobromide taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (M_{r1}/M_{r2}) \times 100$$

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 Hydrobromide RS](#) in the *Standard solution* (mg/mL)

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

M_{r1} = molecular weight of dextromethorphan, 271.40

M_{r2} = molecular weight of dextromethorphan hydrobromide, 352.32

Acceptance criteria: NMT 0.10%

ASSAY

• PROCEDURE

Mobile phase: 0.007 M docusate sodium and 0.007 M ammonium nitrate in [acetonitrile](#) and [water](#) (70:30), filtered and degassed. Dissolve the docusate sodium in the [acetonitrile](#) and [water](#) mixture before adding the ammonium nitrate. Adjust the solution with [glacial acetic acid](#) to a pH of 3.4.

Standard stock solution: 1 mg/mL of [USP Dextromethorphan Hydrobromide RS](#) in [water](#)

Standard solution: 0.1 mg/mL of [USP Dextromethorphan Hydrobromide RS](#) from *Standard stock solution* in *Mobile phase*

Sample stock solution: 1 mg/mL of Dextromethorphan Hydrobromide in [water](#)

Sample solution: 0.1 mg/mL of Dextromethorphan Hydrobromide from *Sample stock solution* in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 280 nm

Column: 4.6-mm × 25-cm; 5-μm packing L1

Flow rate: 1 mL/min

Injection volume: 20 μL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.5

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of dextromethorphan hydrobromide ($C_{18}H_{25}NO \cdot HBr$) in the portion of Dextromethorphan Hydrobromide taken:

$$\text{Result} = (r_u/r_s) \times (C_s/C_u) \times 100$$

r_u = peak response from the *Sample solution*

r_s = peak response from the *Standard solution*

C_s = concentration of [USP Dextromethorphan Hydrobromide RS](#) in the *Standard solution* (mg/mL)

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

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

IMPURITIES

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

• LIMIT OF PHENOLIC COMPOUNDS

Sample: 5 mg of Dextromethorphan Hydrobromide

Analysis: To the *Sample* add 1 drop of [3 N hydrochloric acid](#), 1 mL of [water](#), and 2 drops of [ferric chloride TS](#). 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 Hydrobromide 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