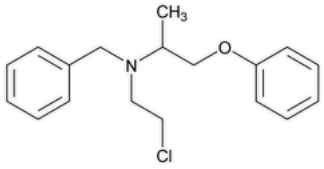
Status: Currently Official on 18-Feb-2025
Official Date: Official as of 01-Oct-2024
Document Type: USP Monographs
DocId: GUID-F0011DD0-CCF4-4A59-897A-A26DE2D59758_5_en-US
DOI: https://doi.org/10.31003/USPNF_M63660_05_01
DOI Ref: b0zy4

Phenoxybenzamine Hydrochloride



• HCl

$C_{18}H_{22}ClNO \cdot HCl$ 340.29

Benzenemethanamine, *N*-(2-chloroethyl)-*N*-(1-methyl-2-phenoxyethyl)-, hydrochloride;

N-(2-Chloroethyl)-*N*-(1-methyl-2-phenoxyethyl)benzylamine hydrochloride CAS RN®: 63-92-3; UNII: X1IEG24OHL.

DEFINITION

Phenoxybenzamine Hydrochloride contains NLT 98.0% and NMT 102.0% of phenoxybenzamine hydrochloride ($C_{18}H_{22}ClNO \cdot HCl$), calculated on the dried basis.

IDENTIFICATION

• **A. Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*:** 197K

• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

Change to read:

• **Procedure**

Solution A: Dissolve 2.2 g of ▲sodium phosphate, monobasic, anhydrous▲ (ERR-1-Oct-2024) in 1 L of water. Adjust with phosphoric acid to a pH of 3.0.

Solution B: Acetonitrile

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	60	40
3.0	60	40
15.0	20	80
17.0	20	80
17.1	60	40
20	60	40

System suitability solution: 0.2 mg/mL of USP Phenoxybenzamine Hydrochloride RS and 50 µg/mL of USP Phenoxybenzamine Nitrile RS in *Solution B*

Standard solution: 0.2 mg/mL of USP Phenoxybenzamine Hydrochloride RS in *Solution B*

Sample solution: 0.2 mg/mL of Phenoxybenzamine Hydrochloride in *Solution B*

Chromatographic system

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

Mode: LC

Detector: UV 268 nm

Column: 4.6-mm × 15-cm; 3.5-µm packing L7

Autosampler temperature: 4°

Flow rate: 1.2 mL/min

Injection volume: 10 µL

System suitability

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

[NOTE—See *Table 2* for the relative retention times of phenoxybenzamine and phenoxybenzamine nitrile.]

Suitability requirements

Resolution: NLT 2.0 between phenoxybenzamine and phenoxybenzamine nitrile, *System suitability solution*

Tailing factor: NMT 1.5, *Standard solution*

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of phenoxybenzamine hydrochloride ($C_{18}H_{22}ClNO \cdot HCl$) in the portion of Phenoxybenzamine Hydrochloride taken:

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

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

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

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

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

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

IMPURITIES

• **ORGANIC IMPURITIES**

Solution A, Solution B, and **Mobile phase:** Prepare as directed in the *Assay*.

System suitability solution: 1.0 mg/mL of USP Phenoxybenzamine Hydrochloride RS and 10 µg/mL of USP Phenoxybenzamine Nitrile RS in *Solution B*

Standard solution: 1.0 µg/mL each of USP Phenoxybenzamine Hydrochloride RS and USP Phenoxybenzamine Alcohol RS in *Solution B*

Sensitivity solution: 0.5 µg/mL each of USP Phenoxybenzamine Hydrochloride RS and USP Phenoxybenzamine Alcohol RS from *Standard solution* in *Solution B*

Sample solution: 1000 µg/mL of Phenoxybenzamine Hydrochloride in *Solution B*

Chromatographic system: Proceed as directed in the *Assay*, except for the *Detector*.

Detector: UV 210 nm

System suitability

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

[NOTE—The relative retention times in *Table 2* are provided as information that could aid in peak assignment.]

Table 2

Name	Relative Retention Time
Phenoxybenzamine alcohol	0.20
Phenoxybenzamine aziridinium[a]	0.27
Phenoxybenzamine	1.0
Phenoxybenzamine nitrile	1.1

[a] 1-Benzyl-1-(1-phenoxypropan-2-yl)aziridin-1-ium. It can be formed in-situ under the chromatographic conditions.

Suitability requirements

Resolution: NLT 2.0 between phenoxybenzamine and phenoxybenzamine nitrile, *System suitability solution*

Relative standard deviation: NMT 5.0% for phenoxybenzamine alcohol and phenoxybenzamine, *Standard solution*

Signal-to-noise ratio: NLT 10 for phenoxybenzamine alcohol and phenoxybenzamine, *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of phenoxybenzamine alcohol in the portion of Phenoxybenzamine Hydrochloride taken:

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

r_U = peak response of phenoxybenzamine alcohol from the *Sample solution*

r_S = peak response of phenoxybenzamine alcohol from the *Standard solution*

C_S = concentration of USP Phenoxybenzamine Alcohol RS in the *Standard solution* (µg/mL)

C_U = concentration of Phenoxybenzamine Hydrochloride in the *Sample solution* (µg/mL)

Calculate the percentage of any unspecified impurity in the portion of Phenoxybenzamine Hydrochloride taken:

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

r_U = peak response of any unspecified impurity from the *Sample solution*

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

C_S = concentration of USP Phenoxybenzamine Hydrochloride RS in the *Standard solution* (µg/mL)

C_U = concentration of Phenoxybenzamine Hydrochloride in the *Sample solution* (µg/mL)

Acceptance criteria: See *Table 3*. The reporting threshold is 0.05%.

Table 3

Name	Acceptance Criteria, NMT (%)
Phenoxybenzamine alcohol	0.10
Any unspecified impurity[a]	0.10
Total impurities[a]	0.50

[a] Exclude phenoxybenzamine aziridinium, if present.

SPECIFIC TESTS

• **Loss on Drying ⟨731⟩**

Analysis: Dry under vacuum at 60° for 2 h.

Acceptance criteria: NMT 0.5%

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in well-closed containers.

• **USP Reference Standards ⟨11⟩**

USP Phenoxybenzamine Alcohol RS

2-[Benzyl(1-phenoxypropan-2-yl)amino]ethan-1-ol.

$C_{18}H_{23}NO_2$ 285.39

USP Phenoxybenzamine Hydrochloride RS

USP Phenoxybenzamine Nitrile RS

3-[Benzyl(1-phenoxypropan-2-yl)amino]propanenitrile.

$C_{19}H_{22}N_2O$ 294.40

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

Topic/Question	Contact	Expert Committee
PHENOXYBENZAMINE HYDROCHLORIDE	Documentary Standards Support	SM22020 Small Molecules 2
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. 49(2)
Current DocID: GUID-F0011DD0-CCF4-4A59-897A-A26DE2D59758_5_en-US
DOI: https://doi.org/10.31003/USPNF_M63660_05_01
DOI ref: b0zy4