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# Phentermine Hydrochloride Tablets

**DEFINITION**
Phentermine Hydrochloride Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of phentermine hydrochloride ($C_{10}H_{15}N \cdot HCl$).

**IDENTIFICATION**

- **A.**

**Sample solution:** Stir a portion of finely powdered Tablet contents in acetone to prepare a solution containing a nominal concentration at about 1 mg/mL of phentermine hydrochloride.

**Analysis:** Filter the *Sample solution* using an acetone resistant filter. Transfer 1 mL of the clear filtrate to a mortar containing about 200 mg of potassium bromide, triturate with a pestle, and air-dry to allow the acetone to evaporate. Place in an oven at 125° for 30 min to dry the mixture.

**Acceptance criteria:** The IR absorption spectrum of a potassium bromide dispersion prepared from the residue exhibits maxima only at the same wavelengths as that of a similar preparation of USP Phentermine Hydrochloride RS.

- **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**

- **Procedure**

**Mobile phase:** Prepare a suitably degassed solution containing 0.03% diethylamine in methanol.

**Internal standard solution:** About 0.02 mg/mL of caffeine in *Mobile phase*

**Standard solution:** USP Phentermine Hydrochloride RS in the *Internal standard solution*, equivalent to 0.75 mg/mL of phentermine hydrochloride

**Sample solution:** Transfer an equivalent to 7.5 mg, from NLT 20 finely powdered Tablets, to a suitable flask. Pipet 10.0 mL of the *Internal standard solution* into the flask. Insert the stopper, mix, and sonicate for about 10 min. Pass through a filter of 0.5-µm pore size.

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 254 nm

**Column:** 4.6-mm × 25-cm; packing L1

**Flow rate:** 1.5 mL/min

**Injection volume:** 10 µL

**System suitability**

**Sample:** *Standard solution*

[Note—The relative retention times for caffeine and phentermine are about 0.5 and 1.0, respectively.]

**Suitability requirements**

**Resolution:** NLT 4 between caffeine and phentermine

**Column efficiency:** NLT 2000 theoretical plates

**Relative standard deviation:** NMT 2.0%

**Analysis**

**Samples:** *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of phentermine hydrochloride ($C_{10}H_{15}N \cdot HCl$) in the portion of Tablets taken:

$$\text{Result} = (R_U/R_S) \times (C_S/C_U) \times 100$$

$R_U$ = peak response ratio of phentermine to the internal standard from the *Sample solution*

$R_S$ = peak response ratio of phentermine to the internal standard from the *Standard solution*

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

$C_U$ = nominal concentration of phentermine hydrochloride in the *Sample solution* (mg/mL)

**Acceptance criteria:** 90.0%–110.0%

## PERFORMANCE TESTS

• **Dissolution,** *Procedure for a Pooled Sample*⟨711⟩

**Medium:** Water; 900 mL. Use 500 mL for Tablets containing 15 mg or less of phentermine hydrochloride.

**Apparatus 2:** 50 rpm

**Time:** 45 min

**Solution A:** Dissolve 1.1 g of sodium 1-heptanesulfonate in 1 L of water. Add 3.5 mL of glacial acetic acid, and mix.

**Mobile phase:** Methanol and *Solution A* (525:475). Filter, degas, and adjust with phosphoric acid to a pH of 2.5.

**Sample solution:** Filtered portion of the pooled sample under test

**Standard solution:** Dissolve USP Phentermine Hydrochloride RS in water, and dilute with water, if necessary, to obtain a known concentration approximately equivalent to the *Sample solution*.

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 208 nm

**Column:** 4.6-mm × 25-cm; packing L1

**Flow rate:** 1 mL/min

**Injection volume:** 25 µL

**System suitability**

**Sample:** *Standard solution*

**Suitability requirements**

**Tailing factor:** NMT 2.0

**Relative standard deviation:** NMT 2.0%

**Analysis**

**Samples:** *Sample solution* and *Standard solution*

Calculate the percentage of the labeled amount of phentermine hydrochloride ($C_{10}H_{15}N \cdot HCl$) dissolved:

$$\text{Result} = (r_U/r_S) \times C_S \times V \times (1/L)$$

$r_U$ = peak response from the *Sample solution*

$r_S$ = peak response from the *Standard solution*

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

$V$ = volume of *Medium*, 900 mL or 500 mL

$L$ = label claim (mg/Tablet)

**Tolerances:** NLT 75% ($Q$) of the labeled amount of phentermine hydrochloride ($C_{10}H_{15}N \cdot HCl$) is dissolved.

***Change to read:***

• **Uniformity of Dosage Units** ⟨905⟩**:** ▲Meet the requirements▲ (CN 1-Aug-2023)

**Procedure for content uniformity**

**Sample solution:** Proceed as directed in the *Assay*, except prepare the *Sample solution* as follows. Transfer 1 Tablet to each of 10 suitable containers, and add 1 mL of water and 10 mL of the *Internal standard solution* to each. Mix, sonicate for about 10 min after each Tablet has disintegrated, and filter.

▲▲ (CN 1-Aug-2023)

## ADDITIONAL REQUIREMENTS

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

• **USP Reference Standards** ⟨11⟩

USP Phentermine Hydrochloride RS

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

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| PHENTERMINE HYDROCHLORIDE TABLETS | Documentary Standards Support | SM22020 Small Molecules 2 |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br>RSTECH@usp.org | SM22020 Small Molecules 2 |

**Chromatographic Database Information:** Chromatographic Database

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