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Add the following:

▲Benzphetamine Hydrochloride Tablets

DEFINITION

Benzphetamine Hydrochloride Tablets contain NLT 93.0% and NMT 105.0% of the labeled amount of benzphetamine hydrochloride ($C_{17}H_{21}N \cdot HCl$).

IDENTIFICATION

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

• **B.** The UV spectrum of the benzphetamine peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY

• **Procedure**

Buffer: Dissolve 2.76 g of monobasic sodium phosphate dihydrate in 1000 mL of water. Add 1.0 mL of triethylamine and adjust with phosphoric acid to a pH of 4.5.

Solution A: Acetonitrile and *Buffer* (10:90)

Solution B: Acetonitrile and water (80:20)

Mobile phase: *Solution A* and *Solution B* (65:35)

Diluent: Methanol and water (50:50)

Standard solution: 0.2 mg/mL of USP Benzphetamine Hydrochloride RS in *Diluent*. Sonicate to dissolve if necessary.

Sample solution: Nominally 0.2 mg/mL of benzphetamine hydrochloride in *Diluent*, prepared as follows. Transfer an adequate amount of benzphetamine hydrochloride from NLT 20 finely powdered Tablets to a suitable volumetric flask. Add about 60% of the final volume of *Diluent* and shake vigorously to disperse the Tablet powder. Sonicate for an additional NLT 60 min with intermediate shaking. Cool to room temperature and dilute with *Diluent* to volume. Pass a portion through a suitable filter with a 0.45-µm pore size. Discard the first few milliliters of filtrate.

Chromatographic system

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

Mode: LC

Detector: UV 207 nm. For *Identification B*, use a diode array detector in the range of 200–400 nm.

Column: 4.6-mm × 25-cm; 5-µm packing L7

Temperatures

Autosampler: 15°

Column: 40°

Flow rate: 1.0 mL/min

Injection volume: 10 µL

Run time: NLT 2.1 times the retention time of benzphetamine

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of benzphetamine hydrochloride ($C_{17}H_{21}N \cdot HCl$) in the portion of Tablets taken:

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

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

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

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

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

Acceptance criteria: 93.0%–105.0%

PERFORMANCE TESTS

• **Dissolution** ⟨711⟩

Use plastic vials for analysis.

Medium: Water; 900 mL

Apparatus 2: 50 rpm

Time: 30 min

Buffer: Dissolve 2.76 g of monobasic sodium phosphate dihydrate in 1000 mL of water. Add 0.5 mL of triethylamine and adjust with phosphoric acid to a pH of 6.0.

Mobile phase: Acetonitrile and *Buffer* (70:30)

Standard stock solution: 0.55 mg/mL of USP Benzphetamine Hydrochloride RS, prepared as follows. Transfer an adequate amount of USP Benzphetamine Hydrochloride RS to a suitable volumetric flask. Add 5% of the final volume of acetonitrile and sonicate to dissolve. Dilute with *Medium* to volume.

Standard solution: 0.055 mg/mL of USP Benzphetamine Hydrochloride RS in *Medium* from *Standard stock solution*

Sample solution: Pass a portion of the solution under test through a suitable filter of 0.45-µm pore size.

Chromatographic system

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

Mode: LC

Detector: UV 207 nm

Column: 4.6-mm × 25-cm; 5-µm packing L7

Column temperature: 25°

Flow rate: 1.0 mL/min

Injection volume: 10 µL

Run time: NLT 1.8 times the retention time of benzphetamine

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of benzphetamine hydrochloride ($C_{17}H_{21}N \cdot HCl$) dissolved:

$$\text{Result} = (r_U/r_S) \times C_S \times V \times (1/L) \times 100$$

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

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

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

V = volume of *Medium* (mL), 900

L = label claim (mg/Tablet)

Tolerances: NLT 80% (Q) of the labeled amount of benzphetamine hydrochloride ($C_{17}H_{21}N \cdot HCl$) is dissolved.

• **Uniformity of Dosage Units** ⟨905⟩**:** Meet the requirements

IMPURITIES

• **Organic Impurities**

Solution A: 1.38 g of monobasic sodium phosphate dihydrate in 1000 mL of water

Solution B: Acetonitrile and water (80:20)

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	80	20

Time (min)	Solution A (%)	Solution B (%)
5	75	25
10	60	40
15	40	60
20	15	85
22	15	85
23	80	20
30	80	20

Diluent: Methanol and water (50:50)

System suitability solution: 0.002 mg/mL each of USP Benzphetamine Hydrochloride RS, USP Benzphetamine Related Compound E RS, and USP Methamphetamine Hydrochloride RS in *Diluent*. Sonicate to dissolve if necessary.

Sensitivity solution: 0.0001 mg/mL of USP Benzphetamine Hydrochloride RS in *Diluent*

Standard solution: 0.002 mg/mL of USP Benzphetamine Hydrochloride RS in *Diluent*. Sonicate to dissolve if necessary.

Sample solution: Nominally 1 mg/mL of benzphetamine hydrochloride in *Diluent*, prepared as follows. Transfer an adequate amount of benzphetamine hydrochloride from NLT 20 finely powdered Tablets to a suitable volumetric flask. Add about 40% of the final volume of *Diluent* and shake vigorously to disperse the Tablet powder. Sonicate for an additional NLT 60 min with intermediate shaking. Cool to room temperature and dilute with *Diluent* to volume. Pass a portion through a suitable filter with a 0.45-µm pore size. Discard the first few milliliters of filtrate.

Chromatographic system

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

Mode: LC

Detector: UV 207 nm

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

Temperatures

Autosampler: 15°

Column: 40°

Flow rate: 1.2 mL/min

Injection volume: 20 µL

System suitability

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

Suitability requirements

Resolution: NLT 3.0 between benzphetamine related compound E and benzphetamine, *System suitability solution*

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

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Tablets taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

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

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

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

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

F = relative response factor of each individual impurity (see *Table 2*)

Acceptance criteria: See *Table 2*.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Methamphetamine hydrochloride	0.35	0.68	0.10
Benzphetamine related compound E	0.90	0.93	0.10
Benzphetamine hydrochloride	1.00	1.00	—
Any unspecified impurity	—	1.00	0.10
Total impurities	—	—	1.0

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers, and store at controlled room temperature.

• **USP Reference Standards** ⟨11⟩

USP Benzphetamine Hydrochloride RS

USP Benzphetamine Related Compound E RS

(1*S*,2*S*)-2-[Benzyl(methyl)amino]-1-phenylpropan-1-ol hydrochloride.

$C_{17}H_{21}NO \cdot HCl$ 291.82

USP Methamphetamine Hydrochloride RS

(*S*)-*N*-Methyl-1-phenylpropan-2-amine hydrochloride.

$C_{10}H_{15}N \cdot HCl$ 185.69▲ (USP 1-Aug-2019)

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

Topic/Question	Contact	Expert Committee
BENZPHETAMINE HYDROCHLORIDE TABLETS	Documentary Standards Support	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

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