Oxybutynin Chloride Tablets

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Expert Committee	Small Molecules 3

In accordance with the Rules and Procedures of the Council of Experts, the Small Molecules 3 Expert Committee has revised the Oxybutynin Chloride Tablets monograph. The purpose for the revision is to add *Dissolution Test 3* to accommodate FDA-approved drug products with different dissolution conditions and/or tolerances than the existing dissolution test(s).

Dissolution Test 3 was validated using the Waters Sunfire C18 brand of L1 column. The typical retention time for oxybutynin is about 4 min.

The Oxybutynin Chloride Tablets Revision Bulletin supersedes the currently official monograph.

Should you have any questions, please contact Behnaz Almasi, Scientific Liaison (301-692-3412 or ba@usp.org).

Revision Bulletin
Official: April 1, 2021

Oxybutynin Chloride Tablets

DEFINITION

Oxybutynin Chloride Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of $C_{22}H_{31}NO_3 \cdot HCl$.

IDENTIFICATION

- **Thin-Layer Chromatographic Identification Test ⟨201⟩**

Sample solution: Add a portion of powdered Tablets, equivalent to about 50 mg of oxybutynin chloride, to 10 mL of chloroform. Mix for two minutes, and centrifuge. Use the supernatant layer.

Developing solvent system: Methanol

Visualization: Iodine vapor

ASSAY

- **Procedure**

Solution A: Methanol, water, and triethylamine (800: 3200: 0.9). Adjust with phosphoric acid to a pH of 3.5 ± 0.05.

Mobile phase: Acetonitrile and *Solution A* (1:4)

Standard solution: 0.05 mg/mL of USP Oxybutynin Chloride RS in *Mobile phase*

Sample solution: Transfer an amount of powdered Tablets (from NLT 20 Tablets) nominally equivalent to 50 mg of oxybutynin chloride to a 1000-mL volumetric flask. Add about 400 mL of *Mobile phase*, sonicate for about 10 min, shake by mechanical means for about 45 min, and dilute with *Mobile phase* to volume.

Chromatographic system

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

Mode: LC

Detector: UV 203 nm

Column: 4-mm × 30-cm; packing L10

Flow rate: 2 mL/min

Injection size: 20 µL

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 $C_{22}H_{31}NO_3 \cdot HCl$ in the portion of Tablets taken:

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

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

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

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

Change to read:

- **Dissolution** ⟨711⟩

Test 1

Medium: Water; 900 mL

Apparatus 2: 50 rpm

Time: 30 min

Sample solution: Pass a portion of the solution under test through a suitable 0.45-µm filter. Dilute with *Medium* if necessary.

Analysis: Determine the amount of $C_{22}H_{31}NO_3 \cdot HCl$ dissolved using the method set forth in the *Assay*, making any necessary modifications to the concentration of the *Standard solution* to correspond to that of the solution under test and injecting 100 µL of both solutions.

Tolerances: NLT 80% (*Q*) of the labeled amount of $C_{22}H_{31}NO_3 \cdot HCl$ is dissolved.

Test 2: If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 2*.

Medium: 0.01 N hydrochloric acid; 900 mL

Apparatus 2: 50 rpm

Time: 30 min

Standard solution: 5 µg/mL of USP Oxybutynin Chloride RS in *Medium*. This solution is stable for 5 days at ambient conditions.

Sample solution: Pass a portion of the solution under test through a suitable 0.45-µm filter, discarding the first few mL.

Mobile phase: Water, acetonitrile, and phosphoric acid (760:240:1)

Chromatographic system

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

Mode: LC

Detector: UV 203 nm

Column: 4.6-mm × 7.5-cm; 3.5-µm packing L7

Column temperature: 40°

Flow rate: 1.5 mL/min

Injection size: 100 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 3.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of oxybutynin chloride dissolved:

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

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of oxybutynin chloride in the *Standard solution*

L = Tablet label claim (mg)

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

Tolerances: NLT 80% (Q) of the labeled amount of oxybutynin chloride is dissolved.

▲**Test 3:** If the product complies with this test, the labeling indicates that it meets USP *Dissolution Test 3*.

Medium: 0.1 N hydrochloric acid; 500 mL, degassed

Apparatus 2: 50 rpm

Time: 30 min

Standard solution: 0.01 mg/mL of USP Oxybutynin Chloride RS in *Medium*. Sonicate to dissolve, if necessary.

Sample solution: Pass a portion of the solution under test through a suitable filter of 0.45-µm pore size, discarding the first 5 mL of the filtrate.

Solution A: 0.05% Trifluoroacetic acid in water

Solution B: 0.05% Trifluoroacetic acid in acetonitrile

Mobile phase: *Solution A* and *Solution B* (60:40)

Chromatographic system

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

Mode: LC

Detector: UV 203 nm

Column: 4.6-mm × 15-cm; 3.5-µm packing L1

Column temperature: 45°

Flow rate: 1 mL/min

Injection volume: 65 µL

Run time: NLT 2.5 times the retention time of oxybutynin

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 3.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of oxybutynin chloride ($C_{22}H_{31}NO_3 \cdot HCl$) dissolved:

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

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

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

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

L = label claim (mg/Tablet)

V = volume of *Medium*, 500 mL

Tolerances: NLT 80% (Q) of the labeled amount of oxybutynin chloride ($C_{22}H_{31}NO_3 \cdot HCl$) is dissolved.▲ (RB 1-Apr-2021)

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

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight, light-resistant containers.
- **Labeling:** When more than one *Dissolution* test is given, the labeling states the *Dissolution* test used only if *Test 1* is not used.
- **USP Reference Standards** ⟨11⟩
  USP Oxybutynin Chloride RS

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