Oxybutynin Chloride Tablets

**Type of Posting**  Revision Bulletin  
**Posting Date**  26-Mar-2021  
**Official Date**  1-Apr-2021  
**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).
Oxybutynin Chloride Tablets

DEFINITION
Oxybutynin Chloride Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of \( \text{C}_{22}\text{H}_{31}\text{NO}_3 \cdot \text{HCl} \).

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 \( \text{C}_{22}\text{H}_{31}\text{NO}_3 \cdot \text{HCl} \) in the portion of Tablets taken:

\[
\text{Result} = \left( \frac{r_U}{r_S} \right) \times \left( \frac{C_S}{C_U} \right) \times 100
\]

\( r_U \) = peak response from the Sample solution
\( r_S \) = peak response from the Standard solution
\[ C_S = \text{concentration of USP Oxybutynin Chloride RS in the Standard solution (mg/mL)} \]
\[ C_U = \text{nominal concentration of the Sample solution (mg/mL)} \]

**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 \( \text{C}_{22}\text{H}_{31}\text{NO}_3 \cdot \text{HCl} \) 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 \( \text{C}_{22}\text{H}_{31}\text{NO}_3 \cdot \text{HCl} \) 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 \(L_7\)
- **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:

\[
\text{Result} = \left( \frac{r_U}{r_S} \right) \times \left( \frac{C_S}{L} \right) \times V \times 100
\]

\[ r_U \quad \text{= peak response from the Sample solution} \]
\[ r_S \text{ = peak response from the Standard solution} \]
\[ C_S \text{ = concentration of oxybutynin chloride in the Standard solution} \]
\[ L \text{ = Tablet label claim (mg)} \]
\[ V \text{ = volume of Medium (mL), 900} \]

**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:

\[
\text{Result} = \left( \frac{r_U}{r_S} \right) \times C_S \times \frac{1}{L} \times V \times 100
\]

- \( r_U \) = 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