

Oxymorphone Hydrochloride Extended-Release Tablets

DEFINITION
Oxymorphone Hydrochloride Extended-Release Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of oxymorphone hydrochloride ($C_{17}H_{19}NO_4 \cdot HCl$).

IDENTIFICATION

- A.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.
- B.** The UV absorption spectra of the major peak of the *Sample solution* and that of the *Standard solution* exhibit maxima and minima at the same wavelengths, as obtained in the Assay.

ASSAY

- PROCEDURE**
Solution A: Dissolve 2.34 g of sodium 1-octanesulfonate monohydrate in 1000 mL of water. Adjust with phosphoric acid to a pH of 2.80.
Solution B: Acetonitrile and methanol (50:50)
Mobile phase: See [Table 1](#).

Table 1

Time (min)	Solution A (%)	Solution B (%)
0.00	77.0	23.0
2.50	77.0	23.0
17.50	54.0	46.0
25.00	31.0	69.0
25.05	1.5	98.5
32.50	1.5	98.5
32.55	77.0	23.0
38.00	77.0	23.0

Diluent: Methanol and phosphoric acid (1000:1)
Standard stock solution: 1.78 mg/mL of [USP Oxymorphone RS](#) in *Diluent*
Standard solution: 0.357 mg/mL of [USP Oxymorphone RS](#) in *Solution A* from the *Standard stock solution*
Sample stock solution: Nominally 2 mg/mL of oxymorphone hydrochloride in *Diluent* prepared as follows. Take NLT 8 Tablets, cut each into small pieces, and transfer to a suitable flask. Add a suitable volume of *Diluent* and shake for at least 16 h. Centrifuge at 3500 rpm for 5 min or until a clear supernatant is obtained.
Sample solution: Nominally 0.4 mg/mL of oxymorphone hydrochloride in *Solution A* from the *Sample stock solution*
Chromatographic system
(See [Chromatography \(621\), System Suitability](#).)
Mode: LC
Detectors

Assay: UV 230 nm

Identification test B: Diode array UV 200–360 nm

Column: 4.6-mm × 7.5-cm; 3.5-μm packing L1

Column temperature: 50°

Flow rate: 1.0 mL/min

Injection volume: 20 μL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: 0.8–1.5

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of oxymorphone hydrochloride ($C_{17}H_{19}NO_4 \cdot HCl$) in the portion of Tablets taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (M_{r1}/M_{r2}) \times 100$$

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

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

C_S = concentration of [USP Oxymorphone RS](#) in the *Standard solution* (mg/mL)

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

M_{r1} = molecular weight of oxymorphone hydrochloride, 337.80

M_{r2} = molecular weight of oxymorphone, 301.34

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

• [DISSOLUTION \(711\)](#)

Test 1

Medium: 45 mM phosphate buffer, pH 4.50 (dissolve 6.16 g of monobasic potassium phosphate in 1 L of water. Adjust with 1 N sodium hydroxide or phosphoric acid to a pH of 4.50); 900 mL

Apparatus 2: 50 rpm, with sinker. [NOTE—The Sotax Helix sinker can be used.]

Times: 1, 2, and 8 h

Mobile phase: Dissolve 1.54 g of ammonium acetate in 925 mL of water and mix well. Add 75 mL of acetonitrile and adjust with trifluoroacetic acid to a pH of 4.50.

Standard stock solution: 0.2 mg/mL of [USP Oxymorphone RS](#) in *Medium*

Standard solution: $[(L/900) \times (301.34/337.80)]$ mg/mL of [USP Oxymorphone RS](#) in *Medium* from the *Standard stock solution*, where *L* is the label claim in mg/Tablet

Sample solution: Withdraw 1.5 mL of the solution under test.

Chromatographic system

(See [Chromatography \(621\)](#), *System Suitability*.)

Mode: LC

Detector: UV 230 nm

Column: 4.6-mm × 7.5-cm; 4-μm packing [L11](#)

Column temperature: 60°

Flow rate: 2.0 mL/min

Injection volume: 50 μL

Run time: NLT 2 times the retention time of oxymorphone

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: 0.8–1.5

Relative standard deviation: NMT 2.0%

Analysis**Samples:** *Standard solution* and *Sample solution*Calculate the percentage of the labeled amount of oxymorphone hydrochloride ($C_{17}H_{19}NO_4 \cdot HCl$) dissolved at each time point (*i*):

$$\text{Result}_i = (r_U/r_S) \times C_S \times (M_{r1}/M_{r2}) \times V \times (1/L) \times 100$$

 r_U = peak response of oxymorphone from the *Sample solution* r_S = peak response of oxymorphone from the *Standard solution* C_S = concentration of [USP Oxymorphone RS](#) in the *Standard solution* (mg/mL) M_{r1} = molecular weight of oxymorphone hydrochloride, 337.80 M_{r2} = molecular weight of oxymorphone, 301.34 V = volume of *Medium*, 900 mL L = label claim (mg/Tablet)**Tolerances:** See [Table 2](#).**Table 2**

Time Point (i)	Time (h)	Amount Dissolved (%)
1	1	20–40
2	2	35–55
3	8	NLT 80

The percentages of the labeled amount of oxymorphone hydrochloride ($C_{17}H_{19}NO_4 \cdot HCl$) dissolved at the times specified conform to [Dissolution \(711\), Acceptance Table 2](#).

Test 2: If the product complies with this test, the labeling indicates that the product meets USP *Dissolution Test 2*.**Apparatus 2, Mobile phase, Standard stock solution, Standard solution, Sample solution, Chromatographic system, System suitability, and Analysis:** Proceed as directed in *Test 1*.**Medium:** 50 mM phosphate buffer, pH 4.50 (dissolve 6.8 g of monobasic potassium phosphate in 1 L of water. Adjust with 1 N sodium hydroxide or phosphoric acid to a pH of 4.50); 900 mL**Times:** 1, 4, and 10 h**Tolerances:** See [Table 3](#).**Table 3**

Time Point (i)	Time (h)	Amount Dissolved (%)
1	1	30–50
2	4	65–85
3	10	NLT 85

The percentages of the labeled amount of oxymorphone hydrochloride ($C_{17}H_{19}NO_4 \cdot HCl$) dissolved at the times specified conform to [Dissolution \(711\), Acceptance Table 2](#).

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