Status: Currently Official on 16-Feb-2025
Official Date: Official as of 01-May-2021
Document Type: USP Monographs
DocId: GUID-A3B4217F-BB3E-42B9-B0AE-2EFB60CFC1B4_2_en-US
DOI: https://doi.org/10.31003/USPNF_M59710_02_01
DOI Ref: qx3jl

Oxymetholone Tablets

DEFINITION

Oxymetholone Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of oxymetholone ($C_{21}H_{32}O_3$).

IDENTIFICATION

Delete the following:

▲• **A. Infrared Absorption**

Sample: Nominally 50 mg of oxymetholone from powdered Tablets

Analysis: Mix the *Sample* with 15 mL of solvent hexane, and stir occasionally for 15 min. Centrifuge the mixture, and decant and discard the solvent hexane. Extract the residue with two 10-mL portions of solvent hexane, centrifuging and decanting as before, and discard the solvent hexane. Add 25 mL of chloroform to the residue, mix by shaking for 1–2 min, and filter. Evaporate the filtrate to about 3 mL, add a few mL of solvent hexane to induce crystallization, and evaporate to dryness.

Acceptance criteria: The IR absorption spectrum of a potassium bromide dispersion prepared from the oxymetholone so obtained, and previously dried, exhibits maxima only at the same wavelengths as those of a similar preparation of USP Oxymetholone RS, crystallized from the same solvent mixture.▲ (USP 1-May-2021)

Add the following:

▲• **A.** The UV spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲ (USP 1-May-2021)

Add the following:

▲• **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲ (USP 1-May-2021)

ASSAY

Change to read:

• **Procedure**

▲[Note—Protect solutions containing oxymetholone from light.]

Diluted acetic acid: Dilute 2 mL of glacial acetic acid with 1 L of water.

Mobile phase: Tetrahydrofuran, acetonitrile, and *Diluted acetic acid* (32:12:56)

Standard solution: 0.1 mg/mL of USP Oxymetholone RS, prepared as follows. Dissolve an appropriate amount of the material with 50% of the final flask volume of acetonitrile in a suitable volumetric flask. Sonicate until completely dissolved. Dilute with water to volume.

Sample solution: Nominally 0.1 mg/mL of oxymetholone, prepared as follows. Transfer a suitable amount of finely powdered Tablets (NLT 20) to an appropriate volumetric flask. Add 50% of the final flask volume of acetonitrile and sonicate for 25 min with periodic swirling. Dilute with water to volume. Centrifuge a portion of the solution and use the clear supernatant. [Note—Centrifuging at a speed of 3000 rpm for 10 min may be suitable.]

Chromatographic system

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

Mode: LC

Detector: UV 280 nm. For *Identification A*, use a diode array detector in the range of 200–400 nm.

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

Flow rate: 1.2 mL/min

Injection volume: 20 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 1.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of oxymetholone ($C_{21}H_{32}O_3$) 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 Oxymetholone RS in the *Standard solution* (mg/mL)

C_U = concentration of oxymetholone in the *Sample solution* (mg/mL)▲ (USP 1-May-2021)

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

Change to read:

• **Dissolution** ⟨711⟩

Medium: 0.05 M alkaline borate buffer, pH 8.5; 900 mL. [Note—See *Reagents, Indicators, and Solutions—Solutions, Buffer Solutions*.]

Apparatus 1: 100 rpm

Time: 45 min

Standard solution: USP Oxymetholone RS in *Medium*. [Note—An amount of acetonitrile not to exceed 5% of the total volume of the *Standard solution* may be used to bring the Reference Standard into solution before dilution with the *Medium*.]

Sample solution: Pass a portion of the solution under test through a suitable filter, and dilute with *Medium*, if necessary, to a concentration that is similar to that of the *Standard solution*.

Instrumental conditions

Mode: UV

Analytical wavelength: Maximum at about 313 nm

▲**Analysis**

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of oxymetholone ($C_{21}H_{32}O_3$) dissolved:

$$\text{Result} = (A_U/A_S) \times C_S \times D \times V \times (1/L) \times 100$$

A_U = absorbance of the *Sample solution*

A_S = absorbance of the *Standard solution*

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

D = dilution factor for the *Sample solution*, if needed

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)▲ (USP 1-May-2021)

Tolerances: NLT 75% (Q) of the labeled amount of oxymetholone ($C_{21}H_{32}O_3$) is dissolved.

Change to read:

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

▲▲ (USP 1-May-2021)

Add the following:

▲**IMPURITIES**

• **Organic Impurities**

[Note—Protect solutions containing oxymetholone from light.]

System suitability solution: 0.1 mg/mL of USP Oxymetholone RS and 0.02 mg/mL of USP Oxymetholone Related Compound B RS in toluene

Sensitivity solution: 0.001 mg/mL of USP Oxymetholone Related Compound B RS in toluene

Standard solution: 0.02 mg/mL of USP Oxymetholone RS in toluene

Sample solution: Nominally 1.0 mg/mL of oxymetholone, prepared as follows. Transfer a quantity equivalent to 20 mg of oxymetholone from NLT 5 finely powdered Tablets into a 20-mL volumetric flask. Add 15 mL of toluene and sonicate for 2 min, then shake for another 20 min. Dilute with toluene to volume. Centrifuge a portion of the solution and use the clear supernatant. [NOTE—Centrifuging at a speed of 3000 rpm for 10 min may be suitable.]

Chromatographic system

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

Mode: GC

Detector: Flame ionization

Column: 0.32-mm × 30-m capillary; coated with a 0.25-µm film of phase G27

Temperatures

Injection port: 240°

Detector: 325°

Column: See *Table 1*.

Table 1

Initial Temperature (°)	Temperature Ramp (°/min)	Final Temperature (°)	Hold Time at Final Temperature (min)
200	2	270	5

Carrier gas: Helium

Flow rate: 1.5 mL/min

Injection volume: 2 µL

Injection type: Split; split ratio, 5:1

[NOTE—The use of a deactivated inlet liner is recommended.]

System suitability

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

[NOTE—See *Table 2* for the relative retention times.]

Suitability requirements

Resolution: NLT 2.0 between oxymetholone and oxymetholone related compound B, *System suitability solution*

Tailing factor: NMT 1.2 for oxymetholone, *Standard solution*

Signal-to-noise ratio: NLT 10 for oxymetholone related compound B, *Sensitivity solution*

Analysis

Sample: *Sample solution*

Calculate the percentage of each degradation product in the portion of Tablets taken:

$$\text{Result} = (r_U/F_i) \times \{1/[r_T + \Sigma(r_U/F_i)]\} \times 100$$

r_U = peak response of each degradation product from the *Sample solution*

F_i = relative response factor for each corresponding degradation product (see *Table 2*)

r_T = peak response of oxymetholone from the *Sample solution*

Acceptance criteria: See *Table 2*.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Dimethylandrostadiol[a,b]	0.71	—	—

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Mestanolone[c]	0.76	1.4	1.0
Oxymetholone	1.0	—	—
Oxymetholone related compound B[a]	1.1	—	—
2-Formyl-3-methoxy androstanol[a,d]	1.2	—	—
Any individual unspecified degradation product	—	1.0	0.5
Total degradation products	—	—	2.0

[a] Process impurity included in the table for identification only. Process impurities are controlled in the drug substance, and are not to be reported or included in the total impurities for the drug product.

[b] 3α,17α-Dimethyl-5α-androstan-3β,17β-diol.

[c] 17β-Hydroxy-17α-methyl-5α-androstan-3-one.

[d] 2-Formyl-3-methoxy-17α-methyl-5α-androsta-2-en-17β-ol.

▲ (USP 1-May-2021)

ADDITIONAL REQUIREMENTS

Change to read:

• **Packaging and Storage:** Preserve in well-closed containers. ▲Store at controlled room temperature.▲ (USP 1-May-2021)

Change to read:

• **USP Reference Standards** ⟨11⟩

USP Oxymetholone RS

▲ USP Oxymetholone Related Compound B RS

17β-Hydroxy-1-hydroxymethylene-17α-methyl-5α-androstan-3-one.

$C_{21}H_{32}O_3$ 332.48▲ (USP 1-May-2021)

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

Topic/Question	Contact	Expert Committee
OXYMETHOLONE TABLETS	Documentary Standards Support	SM52020 Small Molecules 5
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM52020 Small Molecules 5

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. 49(6)

Current DocID: GUID-A3B4217F-BB3E-42B9-B0AE-2EFB60CFC1B4_2_en-US

DOI: https://doi.org/10.31003/USPNF_M59710_02_01

DOI ref: qx3jl