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# Nortriptyline Hydrochloride Oral Solution

## DEFINITION

Nortriptyline Hydrochloride Oral Solution contains nortriptyline hydrochloride equivalent to NLT 90.0% and NMT 110.0% of the labeled amount of nortriptyline ($C_{19}H_{21}N$).

## IDENTIFICATION

***Change to read:***

• **A. ▲Spectroscopic Identification Tests ⟨197⟩, *Infrared Spectroscopy*:** 197S▲ (USP 1-May-2021)

**Standard solution:** Dissolve 50 mg of USP Nortriptyline Hydrochloride RS in 25 mL of water and transfer to a suitable separatory funnel. Adjust by the dropwise addition of 1 N sodium hydroxide to a pH of NLT 11. The pH can be checked with pH indicator paper. Extract with 15 mL of chloroform, and filter the chloroform extract through about 2 g of anhydrous sodium sulfate that has been previously washed with chloroform. Evaporate the chloroform extract with the aid of heat and a current of air to dryness. Dissolve the residue in 0.5 mL of chloroform.

**Sample solution:** Transfer a suitable volume of Oral Solution containing about 50 mg of nortriptyline hydrochloride to a suitable separatory funnel. Adjust by the dropwise addition of 1 N sodium hydroxide to a pH of NLT 11. The pH can be checked with pH indicator paper. Extract with 15 mL of chloroform, and filter the chloroform extract through about 2 g of anhydrous sodium sulfate that has been previously washed with chloroform. Evaporate the chloroform extract with the aid of heat and a current of air to dryness. Dissolve the residue in 0.5 mL of chloroform.

**Acceptance criteria:** The IR absorption spectrum of the *Sample solution* exhibits maxima only at the same wavelengths as those of the *Standard solution*.

***Change to read:***

• **B. Identification Tests—General ⟨191⟩, *Chemical Identification Tests, Chloride*:** Meets the requirements ▲of the test for amine hydrochlorides▲ (USP 1-May-2021)

## ASSAY

***Change to read:***

• **Procedure**

**Standard solution:** 11.4 µg/mL of USP Nortriptyline Hydrochloride RS in water

**Sample solution:** Nominally 10 µg/mL of nortriptyline prepared as follows. Transfer a measured volume of Oral Solution equivalent to 10 mg of nortriptyline to a suitable separatory funnel. Add 20 mL of water and mix. Adjust by the dropwise addition of 50% sodium hydroxide TS to a pH of NLT 11. The pH can be checked with pH indicator paper. Extract the nortriptyline with four 25-mL portions of chloroform, filtering each extract into a suitable beaker through 12 g of anhydrous sodium sulfate previously washed with 25 mL of chloroform. Rinse the sodium sulfate with four 5-mL portions of chloroform, and collect the rinsings in the beaker. Evaporate the combined chloroform solution with the aid of heat and a current of air to about 10 mL. Transfer the contents of the beaker with the aid of chloroform to a 200-mL volumetric flask. Evaporate the chloroform with the aid of air alone to dryness. [**Caution—**Do not use heat.] Dissolve the residue in 1.7 mL of hydrochloric acid, and dilute with water to volume. Transfer 10.0 mL of the solution to a 50-mL volumetric flask, and dilute with water to volume.

**Instrumental conditions**

▲(See *Ultraviolet-Visible Spectroscopy* ⟨857⟩.)▲ (USP 1-May-2021)

**Mode:** UV

**Analytical wavelength:** About 239 nm

**Cell:** 1 cm

**Blank:** Water

**Analysis**

**Samples:** *Standard solution*, *Sample solution*, and *Blank*

Calculate the percentage of the labeled amount of nortriptyline ($C_{19}H_{21}N$) in the portion of Oral Solution taken:

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

$A_U$ = absorbance of the *Sample solution*

$A_S$ = absorbance of the *Standard solution*

$C_S$ = concentration of USP Nortriptyline Hydrochloride RS in the *Standard solution* (µg/mL)

$C_U$ = nominal concentration of nortriptyline in the *Sample solution* (µg/mL)

$M_{r1}$ = molecular weight of nortriptyline, 263.38

$M_{r2}$ = molecular weight of nortriptyline hydrochloride, 299.84

**Acceptance criteria:** 90.0%–110.0%

**OTHER COMPONENTS**

• **Alcohol Determination** ⟨611⟩, *Procedures, Method II*: 3.0%–5.0% of ethanol ($C_2H_5OH$)

**PERFORMANCE TESTS**

• **Uniformity of Dosage Units** ⟨905⟩

**For Oral Solution packaged in single-unit containers:** Meets the requirements

• **Deliverable Volume** ⟨698⟩

**For Oral Solution packaged in multiple-unit containers:** Meets the requirements

**SPECIFIC TESTS**

• **pH** ⟨791⟩: 2.5–4.0

**ADDITIONAL REQUIREMENTS**

***Change to read:***

• **Packaging and Storage:** Preserve in tight, light-resistant containers. ▲Store at controlled room temperature.▲ (USP 1-May-2021)

• **USP Reference Standards** ⟨11⟩

USP Nortriptyline Hydrochloride RS

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

| Topic/Question | Contact | Expert Committee |
|---|---|---|
| NORTRIPTYLINE HYDROCHLORIDE ORAL SOLUTION | Documentary Standards Support | SM42020 Small Molecules 4 |
| REFERENCE STANDARD SUPPORT | RS Technical Services<br>RSTECH@usp.org | SM42020 Small Molecules 4 |

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