Status: Currently Official on 15-Feb-2025
Official Date: Official as of 01-Mar-2019
Document Type: USP Monographs
DocId: GUID-057B6137-D325-468F-A37E-AF262422C82E_5_en-US
DOI: https://doi.org/10.31003/USPNF_M45897_05_01
DOI Ref: 5u7se

Loratadine Orally Disintegrating Tablets

DEFINITION

Loratadine Orally Disintegrating Tablets contain NLT 95.0% and NMT 105.0% of the labeled amount of loratadine ($C_{22}H_{23}ClN_2O_2$).

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*.

Add the following:

▲• **B.** The UV spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in *Assay, Procedure 1* or *Assay, Procedure 2*.▲2S *(USP41)*

ASSAY

[Note—Matrix effects have been observed that affect the extraction of loratadine. Depending on the composition of the Tablet, use *Assay, Procedure 1* or *Assay, Procedure 2*.]

Change to read:

• **Procedure 1**

Buffer: 2.72 g/L of monobasic potassium phosphate in water. Adjust with 5 N sodium hydroxide solution to a pH of 6.50 ± 0.05, and filter.

Mobile phase: Acetonitrile and *Buffer* (70:30)

Diluent: Acetonitrile and *Buffer* (40:60)

Standard solution: 0.1 mg/mL of USP Loratadine RS in *Mobile phase*

Sample solution: Transfer 10 Tablets into a 500-mL volumetric flask, add 400 mL of acetonitrile, and stir for 10 min. Sonicate the solution for 10 min, and stir for another 10 min. Dilute with acetonitrile to volume, and mix. Dilute an aliquot of the resulting solution with *Diluent* to obtain a solution that has a concentration of about 0.1 mg/mL, based on the label claim. Pass a portion of this solution through a polyvinylidene fluoride (PVDF) filter of 0.45-µm pore size, and discard the first 5 mL of filtrate.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm. ▲For *Identification B*, use a diode array detector in the range of 210–400 nm.▲2S *(USP41)*

Column: 4.6-mm × 15-cm; 5-µm packing L1

Flow rate: 1.0 mL/min

Injection volume: 20 µL

System suitability

Sample: *Standard solution*

Suitability requirements

Column efficiency: NLT 3000 theoretical plates

Tailing factor: NMT 2.0

Relative standard deviation: NMT 2.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of loratadine ▲($C_{22}H_{23}ClN_2O_2$)▲2S *(USP41)* in the portion of Tablets taken:

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

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

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

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

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

Acceptance criteria: 95.0%–105.0%

Change to read:

• **Procedure 2**

Buffer: 2.28 g/L of dibasic potassium phosphate trihydrate

Mobile phase: Methanol, *acetonitrile*, and *Buffer* (6:6:7), adjusted with 10% phosphoric acid to an apparent pH of 7.2

Diluent: Methanol and water (1:1)

System suitability solution: 0.8 µg/mL each of USP Loratadine Related Compound A RS, USP Loratadine Related Compound B RS, and USP Loratadine Related Compound C RS in *Diluent*

Standard solution: 0.4 mg/mL of USP Loratadine RS in *Diluent*. [Note—The solution may be sonicated for 5 min to aid in dissolution.]

Sample solution: Transfer a quantity of Tablets into a 250-mL volumetric flask so that the final concentration is 0.4 mg/mL, based on the label claim. Add 50 mL of water, and sonicate, if necessary, to disperse the Tablets. Add 50 mL of methanol, and shake to dissolve. Dilute with *Diluent* to volume.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm. ▲For *Identification B*, use a diode array detector in the range of 210–400 nm.▲2S *(USP41)*

Column: 4.6-mm × 15-cm; 5-µm packing L7

Flow rate: 1.0 mL/min

Injection volume: 15 µL for the *Standard solution* and *Sample solution*; 50 µL for the *System suitability solution*

System suitability

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

[Note—The relative retention times for loratadine related compound A, loratadine related compound C, loratadine related compound B, and loratadine are about 0.26, 0.31, 0.42, and 1.0, respectively.]

Suitability requirements

Resolution: NLT 1.2 between loratadine related compound A and loratadine related compound C; NLT 1.2 between loratadine related compound C and loratadine related compound B, *System suitability solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 2.0%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of loratadine ▲($C_{22}H_{23}ClN_2O_2$)▲2S *(USP41)* in the portion of Tablets taken:

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

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

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

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

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

Acceptance criteria: 95.0%–105.0%

PERFORMANCE TESTS

• **Disintegration ⟨701⟩**

Test 1

Stage 1: All 6 Tablets completely disintegrate in 1 min.

Stage 2: NLT 16 of 18 Tablets completely disintegrate in 1 min.

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

Analysis: Place a stainless steel wire clip on each Tablet to prevent the Tablet from floating.

Acceptance criteria: NMT 30 s

Change to read:

• **Dissolution ⟨711⟩**

Medium: Simulated gastric fluid without enzymes; 900 mL, deaerated

Apparatus 1: 50 rpm

Time: 6 min

Standard solution: Prepare a solution of USP Loratadine RS in *Medium* at a concentration similar to that expected in the *Sample solution*.

Sample solution: Pass a portion of the solution under test through a suitable filter.

Instrumental conditions

Mode: UV

Analytical wavelength: 278 nm

Cell: 1 cm

Blank: *Medium*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of loratadine ($C_{22}H_{23}ClN_2O_2$) dissolved:

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

A_U = absorbance from the *Sample solution*

A_S = absorbance from the *Standard solution*

C_S = concentration of USP Loratadine RS from the *Standard solution* (mg/mL)

V = volume of *Medium*, 900 mL

L = label claim of loratadine (mg/Tablet)

Tolerances: NLT 80% *(Q)* of the labeled amount of loratadine ▲($C_{22}H_{23}ClN_2O_2$)▲2S *(USP41)* is dissolved.

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

IMPURITIES

• **Organic Impurities, Procedure 1**

Use *Organic Impurities, Procedure 1* if *Assay, Procedure 1* is used.

Buffer, Mobile phase, and **Diluent:** Prepare as directed in *Assay, Procedure 1*.

Sensitivity solution: 0.05 µg/mL of USP Loratadine RS in *Mobile phase*

Standard solution: 0.5 µg/mL of USP Loratadine RS in *Mobile phase*

Sample solution: Transfer 10 Tablets to a 500-mL volumetric flask, add 400 mL of acetonitrile, and stir for about 10 min. Sonicate the solution for 10 min, and stir for another 10 min. Dilute with acetonitrile to volume, and mix. Dilute an aliquot of the resulting solution with *Diluent* to obtain a solution that has a concentration of about 0.1 mg/mL, based on the label claim. Centrifuge the solution for about 10 min, and use the supernatant.

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm × 15-cm; 5-µm packing L1

Flow rate: 1.0 mL/min

Injection volume: 50 µL

System suitability

Samples: *Sensitivity solution* and *Standard solution*

Suitability requirements

Column efficiency: NLT 3000 theoretical plates, *Standard solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 2.0%, *Standard solution*

Signal-to-noise ratio: NLT 10, *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each impurity in the portion of Tablets taken:

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

r_U = peak response of each impurity from the *Sample solution*

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

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

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

F = relative response factor (see *Table 1*)

Acceptance criteria: See *Table 1*.

Table 1

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Loratadine related compound C	0.5	0.64	0.2
Loratadine	1.0	—	—
Individual unspecified impurity	—	1.0	0.1
Total impurities	—	—	0.3

• **Organic Impurities, Procedure 2**

Use *Organic Impurities, Procedure 2* if *Assay, Procedure 2* is used.

Buffer, Mobile phase, Diluent, System suitability solution, and **Sample solution:** Prepare as directed in *Assay, Procedure 2*.

Sensitivity solution: 0.04 µg/mL of USP Loratadine RS in *Diluent*

Standard solution: 0.8 µg/mL of USP Loratadine RS in *Diluent*

Chromatographic system

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

Mode: LC

Detector: UV 254 nm

Column: 4.6-mm × 15-cm; 5-µm packing L7

Flow rate: 1.0 mL/min

Injection volume: 50 µL

System suitability

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

[Note—The relative retention times for loratadine related compound A, loratadine related compound C, loratadine related compound B, and loratadine are about 0.26, 0.31, 0.42, and 1.0, respectively.]

Suitability requirements

Resolution: NLT 1.2 between loratadine related compound A and loratadine related compound C; NLT 1.2 between loratadine related compound C and loratadine related compound B, *System suitability solution*

Tailing factor: NMT 2.0, *Standard solution*

Relative standard deviation: NMT 4.0%, *Standard solution*

Signal-to-noise ratio: NLT 3.0, *Sensitivity solution*

Analysis

Samples: *Sample solution* and *Standard solution*

Calculate the percentage of each impurity in the portion of Tablets taken:

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

r_U = peak response of each impurity from the *Sample solution*

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

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

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

F = relative response factor (see *Table 2*)

Acceptance criteria: See *Table 2*.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Loratadine related	0.26	0.9	0.1

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
compound A			
Loratadine related compound B[a]	0.42	—	—
Unspecified impurity[a]	0.76	—	—
Loratadine	1.0	—	—
Unspecified impurity[a]	1.5	—	—
Individual unspecified impurity	—	1.0	0.1
Total impurities	—	—	0.1

[a] These impurities are controlled in the drug substance and are listed here for information only. These impurities are not included when determining total impurities.

ADDITIONAL REQUIREMENTS

• **Packaging and Storage:** Preserve in tight containers. Store between 20° and 25°.

• **Labeling:** The labeling states with which *Organic Impurities* and *Assay* procedure the article complies, if other than *Procedure 1*. When more than one *Disintegration* test is given, the labeling states the *Disintegration* test used only if *Test 1* is not used.

• **USP Reference Standards** ⟨11⟩

USP Loratadine RS

USP Loratadine Related Compound A RS

8-Chloro-5,6-dihydro-11-(piperidin-4-ylidene)-11*H*-benzo[5,6]cyclohepta[1,2-*b*]pyridine.

$C_{19}H_{19}ClN_2$ 310.82

USP Loratadine Related Compound B RS

8-Chloro-5,6-dihydro-11-(*N*-methylpiperidin-4-ylidene)-11*H*-benzo[5,6]cyclohepta[1,2-*b*]pyridine.

$C_{20}H_{21}ClN_2$ 324.85

USP Loratadine Related Compound C RS

8-Chloro-5,6-dihydro-11*H*-benzo[5,6]cyclohepta[1,2-*b*]pyridin-11-one.

$C_{14}H_{10}ClNO$ 243.69

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

Topic/Question	Contact	Expert Committee
LORATADINE ORALLY-DISINTEGRATING TABLETS	Documentary Standards Support	SM52020 Small Molecules 5

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. PF 43(5)

Current DocID: GUID-057B6137-D325-468F-A37E-AF262422C82E_5_en-US
Previous DocID: GUID-057B6137-D325-468F-A37E-AF262422C82E_2_en-US
DOI: https://doi.org/10.31003/USPNF_M45897_05_01
DOI ref: 5u7se