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Add the following:

▲Lamotrigine Orally Disintegrating Tablets

DEFINITION
Lamotrigine Orally Disintegrating Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of lamotrigine ($C_9H_7Cl_2N_5$).

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 spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.

ASSAY
- **Procedure**

Buffer: 3.4 g/L of monobasic potassium phosphate in water

Mobile phase: Methanol and *Buffer* (60:40)

Standard stock solution: 1.0 mg/mL of USP Lamotrigine RS in *Mobile phase*. Sonication may be used to aid dissolution.

Standard solution: 0.05 mg/mL of USP Lamotrigine RS from the *Standard stock solution* in *Mobile phase*

Sample stock solution: Nominally 2 mg/mL of lamotrigine prepared as follows. Finely powder Tablets (NLT 30) and transfer a portion of the powder equivalent to 500 mg of lamotrigine to a suitable volumetric flask. Dissolve the contents in about 55% of the flask volume of *Mobile phase*, sonicate for NLT 20 min with intermittent shaking, and dilute with *Mobile phase* to volume. Centrifuge a portion of the solution and use the supernatant. [Note—Centrifuging at a speed of NLT 3500 rpm for 10 min may be suitable.]

Sample solution: Nominally 0.05 mg/mL of lamotrigine prepared from the *Sample stock solution* in *Mobile phase*. Pass a portion of the solution through a suitable filter of 0.45-µm pore size, and use a portion of the filtrate after discarding the first 4 mL.

Chromatographic system

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

Mode: LC

Detector: UV 210 nm. For *Identification B*, use a diode array detector in the range of 200–400 nm.

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

Column temperature: 30°

Flow rate: 1.0 mL/min

Injection volume: 10 µL

Run time: NLT 3.5 times the retention time of lamotrigine

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 1.5

Relative standard deviation: NMT 1.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of lamotrigine ($C_9H_7Cl_2N_5$) in the portion of Tablets taken:

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

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

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

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

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

• **Disintegration ⟨701⟩:** NMT 30 s

• **Dissolution ⟨711⟩**

Medium: 0.01 N hydrochloric acid; 900 mL

Apparatus 2: 75 rpm

Time: 15 min

Buffer: 3.4 g/L of monobasic potassium phosphate in water

Mobile phase: Acetonitrile and *Buffer* (25:75)

Standard stock solution: 1 mg/mL of USP Lamotrigine RS in methanol

Standard solution: (*L*/900) mg/mL of lamotrigine from *Standard stock solution* in *Medium*, where *L* is the label claim in mg/Tablet

Sample solution: Pass a portion of the solution under test through a suitable filter of 0.22-µm pore size, and use a portion of the filtrate after discarding the first 4 mL of the solution.

Chromatographic system

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

Mode: LC

Detector: UV 310 nm

Column: 2.1-mm × 5-cm; 1.7-µm packing L1

Column temperature: 30°

Flow rate: 0.3 mL/min

Injection volume: 2.0 µL

Run time: NLT 1.5 times the retention time of lamotrigine

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 the labeled amount of lamotrigine ($C_9H_7Cl_2N_5$) dissolved:

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

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

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

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

V = volume of *Medium*, 900 mL

L = label claim (mg/Tablet)

Tolerances: NLT 80% (*Q*) of the labeled amount of lamotrigine ($C_9H_7Cl_2N_5$) is dissolved.

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

IMPURITIES

• **Organic Impurities**

Buffer: 2.7 g/L of monobasic potassium phosphate in water

Solution A: To 1500 mL of *Buffer* add 10 mL of triethylamine and adjust with phosphoric acid to a pH 2.0.

Solution B: Acetonitrile

Mobile phase: See *Table 1*.

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	76.5	23.5
4	76.5	23.5
14	20.0	80.0
15	76.5	23.5
19	76.5	23.5

Diluent: 0.1 N hydrochloric acid VS

Standard stock solution: 100 µg/mL of USP Lamotrigine RS prepared as follows. Transfer a suitable portion of USP Lamotrigine RS into a suitable volumetric flask. Dissolve in 5% of the flask volume of methanol and dilute with *Diluent* to volume.

Standard solution: 2.5 µg/mL of USP Lamotrigine RS from the *Standard stock solution* in *Diluent*

Sensitivity solution: 0.5 µg/mL of USP Lamotrigine RS from the *Standard stock solution* in *Diluent*

Sample solution: Nominally 500 µg/mL of lamotrigine prepared as follows. Transfer a portion of the Tablet powder, equivalent to 50 mg of lamotrigine, to a suitable volumetric flask and dissolve the contents in 10% of the flask volume of methanol. Sonicate for NLT 10 min with intermittent shaking and dilute with *Diluent* to volume. Pass a portion of the solution through a suitable filter of 0.45-µm pore size, and use a portion of the filtrate after discarding the first 4 mL.

Chromatographic system

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

Mode: LC

Detector: UV 270 nm

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

Column temperature: 35°

Flow rate: 1.0 mL/min

Injection volume: 10 µL

System suitability

Samples: *Standard solution* and *Sensitivity solution*

Suitability requirements

Tailing factor: NMT 2.0 for lamotrigine, *Standard solution*

Relative standard deviation: NMT 5.0% for lamotrigine, *Standard solution*

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of each individual 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 any individual impurity from the *Sample solution*

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

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

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

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

Acceptance criteria: See *Table 2*. The reporting threshold is 0.10%.

Table 2

Name	Relative Retention Time	Relative Response Factor	Acceptance Criteria, NMT (%)
Lamotrigine	1.0	—	—
Lamotrigine related compound C[a]	2.1	0.94	0.5
Any individual unspecified impurity	—	1.0	0.2
Total impurities	—	—	1.0

[a] 3-Amino-6-(2,3-dichlorophenyl)-1,2,4-triazin-5(4*H*)-one.

ADDITIONAL REQUIREMENTS

- **Packaging and Storage:** Preserve in tight containers. Store at controlled room temperature.
- **USP Reference Standards** ⟨11⟩
  USP Lamotrigine RS▲ (USP 1-May-2021)

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

Topic/Question	Contact	Expert Committee
LAMOTRIGINE ORALLY DISINTEGRATING TABLETS	Documentary Standards Support	SM42020 Small Molecules 4
REFERENCE STANDARD SUPPORT	RS Technical Services RSTECH@usp.org	SM42020 Small Molecules 4

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