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Levetiracetam Tablets

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<https://www.uspnf.com/rb-levetiracetam-tabs-20220624>.

DEFINITION

Levetiracetam Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of levetiracetam ($C_8H_{14}N_2O_2$).

IDENTIFICATION

- **A. SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy:** 197K, 197A

Standard solution: 1 mg/mL solution of [USP Levetiracetam RS](#) in solution prepared as follows. Transfer a suitable quantity of [USP Levetiracetam RS](#) to a suitable volumetric flask. Add 70% of the flask volume of [acetone](#). Sonicate for 15 min. Dilute with [acetone](#) to volume.

Standard: Pass 10 mL of the *Standard solution* through a membrane filter of 0.45- μ m pore size. Evaporate acetone from the filtrate completely to form crystals. Scratch the crystals. Weigh 2–4 mg of the residue and 200 mg of KBr in a mortar and pestle. Mix and grind well, and prepare the KBr pellet.

Sample solution: Transfer an amount of finely powdered Tablets (NLT 20) equivalent to 250 mg of levetiracetam to a 50-mL volumetric flask. Add 35 mL of [acetone](#). Sonicate for 15 min. Dilute with [acetone](#) to volume.

Sample: Pass 10 mL of the *Sample solution* through a membrane filter of 0.45- μ m pore size. Evaporate acetone from the filtrate completely to form crystals. Scratch the crystals. Weigh 2–4 mg of the residue and 200 mg of KBr in a mortar and pestle. Mix and grind well, and prepare the KBr pellet.

Analysis: Record the spectra of the *Standard* and *Sample* between 4000 cm^{-1} and 650 cm^{-1} .

Acceptance criteria: The spectrum of the *Sample* corresponds to that of the *Standard*.

- **B.** The retention time of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.

ASSAY

PROCEDURE

Buffer: 1.4 g/L of [monobasic potassium phosphate](#) and 0.6 g/L of sodium [1-heptanesulfonate](#), adjusted with [phosphoric acid](#) to a pH of 2.8

Mobile phase: [Acetonitrile](#) and *Buffer* (8:92)

Diluent: [Acetonitrile](#) and [water](#) (20:80)

Standard solution: 0.35 mg/mL of [USP Levetiracetam RS](#) in *Diluent*. Sonication may be used to aid dissolution.

Sample solution: Nominally 0.4 mg/mL of levetiracetam from NLT 20 Tablets, finely crushed, in *Diluent*. Sonication may be used to aid dissolution.

Chromatographic system

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

Mode: LC

Detector: UV 220 nm

Column: 4.6-mm $\times$ 25-cm; 4- μ m packing [L1](#)

Flow rate: 2 mL/min

Injection volume: 10 μ L

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 levetiracetam ($C_8H_{14}N_2O_2$) 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 Levetiracetam RS](#) in the *Standard solution* (mg/mL)

C_u = nominal concentration of levetiracetam in the *Sample solution* (mg/mL)

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

Change to read:

- [DISSOLUTION \(711\)](#).

Test 1

Medium: [Water](#); 900 mL

Apparatus 2: 50 rpm

Time: See [Table 1](#).

Table 1

Tablet Strength (mg/Tablet)	Time (min)
250	15
500	15
750	15
1000	30

Buffer: 6.8 g/L of [monobasic potassium phosphate](#), adjusted with dilute [potassium hydroxide](#) to a pH of 5.6

Mobile phase: [Acetonitrile](#) and *Buffer* (15:85)

Standard solution: ($L/1000$) mg/mL in *Medium*, where L is the Tablet label claim, in mg

Sample solution: Pass a portion of the solution under test through a suitable filter of 0.45- μ m pore size.

Chromatographic system

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

Mode: LC

Detector: UV 220 nm

Column: 4.6-mm $\times$ 15-cm; 5- μ m packing [L1](#)

Flow rate: 1.2 mL/min

Injection volume: 10 μ L

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 levetiracetam ($C_8H_{14}N_2O_2$) dissolved:

$$\text{Result} = (r_u/r_s) \times (C_s/L) \times V \times 100$$

r_u = peak response from the *Sample solution*

r_s = peak response from the *Standard solution*

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

L = label claim (mg/Tablet)

V = volume of *Medium*, 900 mL

Tolerances: NLT 70% (Q) of the labeled amount of levetiracetam ($C_8H_{14}N_2O_2$) in 15 min for Tablets labeled to contain 250, 500, or 750 mg;

NLT 80% (Q) of the labeled amount of levetiracetam ($C_8H_{14}N_2O_2$) in 30 min for Tablets labeled to contain 1000 mg

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

Medium: [Water](#); 900 mL, deaerate, if necessary