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Rotigotine Transdermal System

DEFINITION

Rotigotine Transdermal System contains NLT 90.0% and NMT 110.0% of the labeled amount of rotigotine ($C_{19}H_{25}NOS$).

IDENTIFICATION

- **A.** The UV spectrum of the rotigotine peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the Assay.
- **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

Change to read:

PROCEDURE

Extraction solvent: Prepare a mixture of [2-propanol](#) and [tert-butylmethylether](#) (80:20). Add 1 mL of [methanesulfonic acid](#) to 1 L of the solvent mixture.

Solution A: 0.5 mL of [methanesulfonic acid](#) in 1 L of [water](#)

Solution B: 0.5 mL of [methanesulfonic acid](#) in 1 L of [acetonitrile](#)

Mobile phase: *Solution A* and *Solution B* (65:35)

Diluent: 1 mL of [methanesulfonic acid](#) in 1 L of [water](#)

Standard stock solution: 0.5 mg/mL of [USP Rotigotine Hydrochloride RS](#) in *Extraction solvent*. [NOTE—Sonication in a cooled ultrasonic bath may be used to aid in dissolution.]

Standard solution: Mix 3 mL of the *Standard stock solution* with 7 mL of *Diluent*.

Sample stock solution: Nominally 0.45 mg/mL of rotigotine from NLT 10 Transdermal Systems prepared as follows. Transfer the required number of Transdermal Systems without the release liner to a suitable flask containing *N* mL of *Extraction solvent*, where *N* is the total area of the Transdermal Systems taken. Close the flask and sonicate the solution for NLT 10 min in a sonicator maintained at 20°, shaking the flask intermittently to ensure the silicone matrix is completely dissolved. [NOTE—Sonication time may be extended if needed to enable complete dissolution of the silicone matrix.]

Sample solution: Mix 3 mL of *Sample stock solution* with 7 mL of *Diluent*. Centrifuge the solution and use the clear supernatant. [NOTE—A centrifuge speed of NLT 4000 rpm for NLT 15 min may be used.]

Chromatographic system

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

Mode: LC

Detector: UV 272 nm. For *Identification A*, use a diode array detector in the range of 200–400 nm.

Column: 4.0-mm × 7.5-cm; 4-μm packing [L7](#)

Column temperature: 30°

Flow rate: 2 mL/min

Injection volume: 10 μL

Run time: NLT 4 times the retention time of rotigotine

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.2

Relative standard deviation: NMT 1.0%

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of rotigotine ($C_{19}H_{25}NOS$) in each Transdermal System taken:

$$\text{Result} = (r_U/r_S) \times C_S \times (V/N) \times (M_{r1}/M_{r2}) \times (1/L) \times 100$$



r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of [USP Rotigotine Hydrochloride RS](#) in the *Standard stock solution* (mg/mL)

V = volume of the *Sample stock solution* (mL)

N = number of Transdermal System units used to prepare the *Sample stock solution*

M_{r1} = molecular weight of rotigotine, ▲315.48▲ (CN 1-Aug-2024)

M_{r2} = molecular weight of rotigotine hydrochloride, 351.93

L = label claim (nominal content) of rotigotine in each Transdermal System (mg/unit)

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

Change to read:

• [DRUG RELEASE \(724\)](#)

Medium: Dissolve 6.9 g of [monobasic sodium phosphate](#) in 1 L of water. Adjust with a suitable concentration of sodium hydroxide or phosphoric acid to a pH of 4.5; 900 mL, deaerated.

Apparatus 5: 50 rpm; Transdermal System on metal disk

Times: 15, 30, 60, and 180 min

Solution A, Solution B, and Mobile phase: Prepare as directed in the Assay.

Standard solution: ($L/800$) mg/mL of [USP Rotigotine Hydrochloride RS](#) in *Medium*, where L is the label claim in mg/unit

Sample solution: Withdraw 2 mL from the vessel at the specified times.

Chromatographic system

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

Mode: LC

Detector: UV 272 nm

Column: 4.0-mm × 7.5-cm; 4-μm packing [L7](#)

Column temperature: 30°

Flow rate: 2 mL/min

Injection volume: 50 μL

Run time: NLT 2.5 times the retention time of rotigotine

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.2 for rotigotine

Relative standard deviation: NMT 2.0% for rotigotine

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount (nominal content) of rotigotine ($C_{19}H_{25}NOS$) released at each time point i :

$$\text{Result} = (r_U/r_S) \times C_S \times V \times (1/L) \times (M_{r1}/M_{r2}) \times 100$$

r_U = peak response from the *Sample solution*

r_S = peak response from the *Standard solution*

C_S = concentration of [USP Rotigotine Hydrochloride RS](#) in the *Standard solution* (mg/mL)

V = volume of the *Medium*, 900 mL

L = label claim (nominal content) of rotigotine in the Transdermal System (mg/unit)

M_{r1} = molecular weight of rotigotine, ▲315.48▲ (CN 1-Aug-2024)

M_{r2} = molecular weight of rotigotine hydrochloride, 351.93