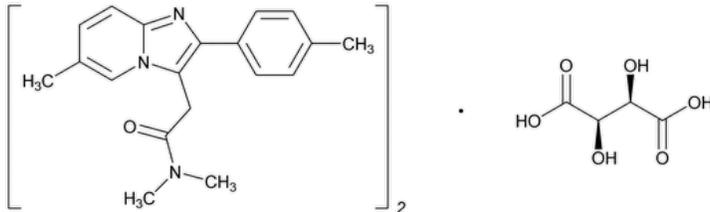


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## Zolpidem Tartrate



$(C_{19}H_{21}N_3O)_2 \cdot C_4H_6O_6$  764.87

Imidazo[1,2-a]pyridine-3-acetamide, *N,N,N*-trimethyl-2-(4-methylphenyl)-, [*R*-(*R*\*,*R*\*)]-2,3-dihydroxy butanedioate;  
*N,N,N*-Trimethyl-2-*p*-tolylimidazo[1,2-*a*]pyridine-3-acetamide L-(+)-tartrate CAS RN<sup>®</sup>: 99294-93-6; UNII: WY6W63843K.

### DEFINITION

Zolpidem Tartrate contains NLT 98.0% and NMT 102.0% of zolpidem tartrate [ $(C_{19}H_{21}N_3O)_2 \cdot C_4H_6O_6$ ], calculated on the anhydrous basis.

### IDENTIFICATION

#### Change to read:

- A.** **▲ SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy:** 197A or 197K ▲ (CN 1-May-2020)

**Sample:** Dissolve 0.10 g of Zolpidem Tartrate in 10 mL of 0.1 M [hydrochloric acid](#). Add 10 mL of [water](#). Add dropwise with stirring 1 mL of diluted ammonia solution. Filter and collect the resulting precipitate. Wash the precipitate with water, and then dry at 100°–105° for 2 h. Use 2 mg of the dried residue.

**Analysis:** The IR spectrum of the free base thus obtained corresponds to the IR spectrum of similarly prepared [USP Zolpidem Tartrate RS](#).

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

- C. REACTION OF TARTRATES**

**Sample:** 0.1 g of Zolpidem Tartrate

**Analysis:** Dissolve the *Sample* in 1 mL of [methanol](#) with gentle heating. To 0.1 mL of the solution, add 0.1 mL of a 100-g/L solution of [potassium bromide](#), 0.1 mL of a 20-g/L solution of [resorcinol](#), and 3 mL of [sulfuric acid](#). Heat on a water bath for 5–10 min. A dark blue color develops. Allow to cool, then pour the solution into water.

**Acceptance criteria:** The dark blue color changes to red.

### ASSAY

- PROCEDURE**

**Buffer:** 5.6 g/L of [phosphoric acid](#). Adjust with [triethylamine](#) to a pH of 5.5.

**Mobile phase:** Methanol, acetonitrile, and *Buffer* (23:18:59)

**System suitability solution:** 0.05 mg/mL each of [USP Zolpidem Tartrate RS](#) and [USP Zolpidem Related Compound A RS](#) in *Mobile phase*

**Standard solution:** 0.1 mg/mL of [USP Zolpidem Tartrate RS](#) in *Mobile phase*

**Sample solution:** 0.1 mg/mL of Zolpidem Tartrate in *Mobile phase*

**Chromatographic system**

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

**Mode:** LC

**Detector:** UV 254 nm

**Column:** 3.9-mm × 15-cm; 4-μm packing L1

**Flow rate:** 1.5 mL/min

**Injection volume:** 20 μL

**Run time:** NLT 3 times the retention time of zolpidem

**System suitability**

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

[NOTE—See [Table 1](#) for the relative retention times.]

**Suitability requirements**

**Resolution:** NLT 2.0 between zolpidem related compound A and zolpidem, System suitability solution

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

**Relative standard deviation:** NMT 1.0%, Standard solution

**Analysis**

**Samples:** Standard solution and Sample solution

Calculate the percentage of zolpidem tartrate  $[(C_{19}H_{21}N_3O)_2 \cdot C_4H_6O_6]$  in the portion of Zolpidem Tartrate taken:

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

$r_U$  = peak response of zolpidem from the Sample solution

$r_S$  = peak response of zolpidem from the Standard solution

$C_S$  = concentration of [USP Zolpidem Tartrate RS](#) in the Standard solution (mg/mL)

$C_U$  = concentration of Zolpidem Tartrate in the Sample solution (mg/mL)

**Acceptance criteria:** 98.0%–102.0% on the anhydrous basis

**IMPURITIES**

• [RESIDUE ON IGNITION \(281\)](#): NMT 0.1%

• **ORGANIC IMPURITIES**

**Buffer, Mobile phase, System suitability solution, and Chromatographic system:** Proceed as directed in the Assay.

**Standard solution:** 0.001 mg/mL of [USP Zolpidem Tartrate RS](#) in Mobile phase

**Sample solution:** 0.5 mg/mL of Zolpidem Tartrate in Mobile phase

**System suitability**

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

[NOTE—See [Table 1](#) for the relative retention times.]

**Suitability requirements**

**Resolution:** NLT 2.0 between zolpidem related compound A and zolpidem, System suitability solution

**Relative standard deviation:** NMT 10.0%, Standard solution

**Analysis**

**Samples:** Standard solution and Sample solution

Calculate the percentage of each impurity in the portion of Zolpidem Tartrate taken:

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

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

$r_S$  = peak response of zolpidem from the Standard solution

$C_S$  = concentration of [USP Zolpidem Tartrate RS](#) in the Standard solution (mg/mL)

$C_U$  = concentration of Zolpidem Tartrate in the Sample solution (mg/mL)

**Acceptance criteria:** See [Table 1](#). Disregard any peak less than 0.05%.

**Table 1**

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Tartaric acid <sup>a</sup>	0.16	—
Zolpidem related compound A	0.83	0.10

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Zolpidem	1.0	–
Any individual impurity	–	0.10
Total impurities	–	0.2

<sup>a</sup> Counter ion peak; not to be reported and not to be included in total impurities.

#### SPECIFIC TESTS

- [WATER DETERMINATION \(921\), Method I, Method Ia](#): NMT 3.0%

#### ADDITIONAL REQUIREMENTS

- **PACKAGING AND STORAGE:** Preserve in well-closed containers, and store at controlled room temperature.

- [USP REFERENCE STANDARDS \(11\)](#).

[USP Zolpidem Tartrate RS](#)

[USP Zolpidem Related Compound A RS](#)

*N,N*-Dimethyl-2-(7-methyl-2-*p*-tolylimidazo[1,2-*a*]pyridin-3-yl)acetamide.

C<sub>19</sub>H<sub>21</sub>N<sub>3</sub>O                      307.39

**Auxiliary Information** - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
ZOLPIDEM TARTRATE	<a href="#">Documentary Standards Support</a>	SM42020 Small Molecules 4
REFERENCE STANDARD SUPPORT	RS Technical Services <a href="mailto:RSTECH@usp.org">RSTECH@usp.org</a>	SM42020 Small Molecules 4

**Chromatographic Database Information:** [Chromatographic Database](#)

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