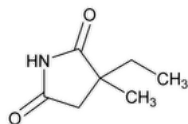


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Ethosuximide



$C_7H_{11}NO_2$ 141.17
 2,5-Pyrrolidinedione, 3-ethyl-3-methyl-, (±)-;
 (±)-2-Ethyl-2-methylsuccinimide CAS RN[®]: 77-67-8; UNII: 5SEH9X1D1D.

Change to read:

DEFINITION

Ethosuximide contains NLT 98.0% and NMT $\blacktriangle 102.0\%$ (USP 1-Aug-2022) of ethosuximide ($C_7H_{11}NO_2$), calculated on the anhydrous basis.

IDENTIFICATION

Change to read:

- **A. SPECTROSCOPIC IDENTIFICATION TESTS (197), Infrared Spectroscopy:** $\blacktriangle 197A$ (USP 1-Aug-2022)
- **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

$\blacktriangle$ **Mobile phase:** [Acetonitrile](#) and [water](#) (12.5: 87.5). To each liter, add 1.0 mL of [glacial acetic acid](#).

Standard solution: 2.0 mg/mL of [USP Ethosuximide RS](#) in *Mobile phase*

Sample solution: 2.0 mg/mL of Ethosuximide in *Mobile phase*

Chromatographic system

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

Mode: LC

Detector: UV 225 nm

Column: 3.9-mm $\times$ 15-cm; 4- μ m packing [L1](#)

Column temperature: 30°

Flow rate: 1 mL/min

Injection volume: 10 μ L

Run time: NLT 2 times the retention time of ethosuximide

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 2.0

Relative standard deviation: NMT 0.73% $\blacktriangle$ (USP 1-Aug-2022)

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of ethosuximide ($C_7H_{11}NO_2$) in the portion of Ethosuximide taken:

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

r_U = peak response $\blacktriangle$ of ethosuximide $\blacktriangle$ (USP 1-Aug-2022) from the *Sample solution*

r_S = peak response $\blacktriangle$ of ethosuximide $\blacktriangle$ (USP 1-Aug-2022) from the *Standard solution*

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

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

Acceptance criteria: 98.0%–▲102.0%▲ (USP 1-Aug-2022) on the anhydrous basis

IMPURITIES

- **RESIDUE ON IGNITION (281):** NMT 0.5%

Change to read:

- **ORGANIC IMPURITIES**

▲**Mobile phase:** [Acetonitrile](#) and [water](#) (12.5: 87.5). To each liter, add 1.0 mL of [glacial acetic acid](#).

System suitability solution: 50 mg/mL of [USP Ethosuximide RS](#) and 0.25 mg/mL of [USP Ethosuximide Related Compound A RS](#) in *Mobile phase*

Sensitivity solution: 0.025 mg/mL of [USP Ethosuximide RS](#) in *Mobile phase*

Standard solution: 0.05 mg/mL each of [USP Ethosuximide RS](#) and [USP Ethosuximide Related Compound A RS](#) in *Mobile phase*

Sample solution: 50 mg/mL of ethosuximide in *Mobile phase*. Sonicate as needed.

Chromatographic system

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

Mode: LC

Detector: UV 225 nm

Column: 3.9-mm × 15-cm; 4-μm packing [L1](#)

Column temperature: 30°

Flow rate: 1 mL/min

Injection volume: 10 μL

Run time: NLT 5 times the retention time of ethosuximide

System suitability

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

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

Suitability requirements

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

Relative standard deviation: NMT 5.0% for ethosuximide and ethosuximide related compound A, *Standard solution*

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

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of ethosuximide related compound A in the portion of Ethosuximide taken:

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

r_U = peak response of ethosuximide related compound A from the *Sample solution*

r_S = peak response of ethosuximide related compound A from the *Standard solution*

C_S = concentration of [USP Ethosuximide Related Compound A RS](#) in the *Standard solution* (mg/mL)

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

Calculate the percentage of each unspecified impurity in the portion of Ethosuximide taken:

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

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

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

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

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

Acceptance criteria: See [Table 1](#). The reporting threshold is 0.05%.

Table 1

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Ethosuximide	1.0	
Ethosuximide related compound A	1.3	