Status: Currently Official on 14-Feb-2025
Official Date: Official as of 01-May-2024
Document Type: USP Monographs
DocId: GUID-5B89E276-ACE3-4DCA-96AA-F3DAB1E6D50A_3_en-US
DOI: https://doi.org/10.31003/USPNF_M32376_03_01
DOI Ref: t6wgf

Etodolac Tablets

DEFINITION
Etodolac Tablets contain NLT 90.0% and NMT 110.0% of the labeled amount of etodolac ($C_{17}H_{21}NO_3$).

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*.

Add the following:

▲• **B.** The UV spectrum of the major peak of the *Sample solution* corresponds to that of the *Standard solution*, as obtained in the *Assay*.▲ (USP 1-May-2024)

ASSAY

Change to read:

• **Procedure**

Mobile phase: Acetonitrile, phosphoric acid, and water (50: 0.025: 50)

System suitability solution: 0.01 mg/mL of USP Etodolac Related Compound A RS and 0.2 mg/mL of USP Etodolac RS in *Mobile phase*

Standard solution: 0.2 mg/mL of USP Etodolac RS in *Mobile phase*. Prepare this solution fresh daily.

Sample stock solution: Nominally 2 mg/mL of etodolac prepared as follows. Transfer a portion of finely powdered Tablets (NLT 20), equivalent to about 1000 mg of etodolac, to a 500-mL volumetric flask, add 300 mL of *Mobile phase*, shake for 15 min, and sonicate for 5 min. Cool, and dilute with *Mobile phase* to volume. Allow to settle for 10 min.

Sample solution: Nominally 0.2 mg/mL of etodolac in *Mobile phase*, from *Sample stock solution*. Pass the solution through a suitable filter of 0.45-µm or finer pore size.

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

Mode: LC

Detector: UV 274 nm. ▲For *Identification B*, use a diode array detector in the range of 190–400 nm.▲ (USP 1-May-2024)

Column: 4.6-mm × 25-cm; ▲10-µm▲ (USP 1-May-2024) packing L1

Flow rate: 1.5 mL/min

Injection volume: 10 µL

System suitability

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

[Note—The relative retention times for etodolac related compound A and etodolac are 0.8 and 1.0, respectively.]

Suitability requirements

Resolution: NLT 2 between etodolac related compound A and etodolac, *System suitability solution*

Tailing factor: NMT 2, *Standard solution*

Relative standard deviation: NMT 2%, *Standard solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of etodolac ($C_{17}H_{21}NO_3$) in the portion of Tablets taken:

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

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

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

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

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

Acceptance criteria: 90.0%–110.0%

PERFORMANCE TESTS

Change to read:

• **Dissolution** ⟨711⟩

Medium: pH 6.8 phosphate buffer; 1000 mL

Apparatus 1: 100 rpm

Time: 30 min

Standard solution: A known concentration of USP Etodolac RS in *Medium*

Sample solution: Pass the solution under test through a suitable filter. Dilute with *Medium*, if necessary, to a suitable concentration that is similar to that of the *Standard solution*.

Instrumental conditions

Mode: UV

Analytical wavelength: Maximum at about 274 nm

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of the labeled amount of etodolac ($C_{17}H_{21}NO_3$) dissolved:

$$\blacktriangle\text{Result} = (A_U/A_S) \times C_S \times V \times D \times (1/L) \times 100$$

A_U = absorbance of the *Sample solution*

A_S = absorbance of the *Standard solution*

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

V = volume of the *Medium*, 1000 mL

D = dilution factor of the *Sample solution*

L = label claim (mg/Tablet)

▲ (USP 1-May-2024)

Tolerances: NLT 80% (Q) of the labeled amount of etodolac ($C_{17}H_{21}NO_3$) is dissolved.

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

Add the following:

▲IMPURITIES

• **Organic Impurities**

Protect the solutions containing etodolac from light.

Solution A: 0.77 g/L of ammonium acetate in water

Solution B: Acetonitrile and *Solution A* (90:10)

Mobile phase: See *Table 1*. Return to original conditions and re-equilibrate the system. [Note—A re-equilibration time of 15 min may be used.]

Table 1

Time (min)	Solution A (%)	Solution B (%)
0	80	20
25	50	50
50	50	50

System suitability solution: 1.0 mg/mL of USP Etodolac RS and 0.002 mg/mL of USP Etodolac Related Compound H RS in acetonitrile. Sonicate to dissolve as needed.

Standard solution: 0.002 mg/mL each of USP Etodolac RS and USP Etodolac Related Compound H RS in acetonitrile. Sonicate to dissolve as needed.

Sensitivity solution: 1.0 µg/mL each of USP Etodolac RS and USP Etodolac Related Compound H RS in acetonitrile, from the *Standard solution*

Sample solution: Nominally 1.0 mg/mL of etodolac prepared as follows. Transfer a portion of finely powdered Tablets (NLT 20), equivalent to about 50 mg of etodolac, to a 50-mL volumetric flask. Add about 30 mL of acetonitrile, sonicate, and dilute with acetonitrile to volume. [Note—A sonication time of 15 min may be used.]

Chromatographic system

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

Mode: LC

Detector: UV 225 nm

Column: 4.6-mm × 15-cm; 3.5-µm packing L26

Temperatures

Autosampler: 5°

Column: 35°

Flow rate: 1 mL/min

Injection volume: 5 µL

System suitability

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

Suitability requirements

Resolution: NLT 3.0 between etodolac and etodolac related compound H (7-ethyltrypthanol), *System suitability solution*

Relative standard deviation: NMT 5.0% for etodolac and etodolac related compound H (7-ethyltrypthanol), *Standard solution*

Signal-to-noise ratio: NLT 10 for etodolac and etodolac related compound H (7-ethyltrypthanol), *Sensitivity solution*

Analysis

Samples: *Standard solution* and *Sample solution*

Calculate the percentage of etodolac related compound H (7-ethyltrypthanol) in the portion of Tablets taken:

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

r_U = peak response of etodolac related compound H (7-ethyltrypthanol) from the *Sample solution*

r_S = peak response of etodolac related compound H (7-ethyltrypthanol) from the *Standard solution*

C_S = concentration of USP Etodolac Related Compound H RS in the *Standard solution* (mg/mL)

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

Calculate the percentage of any unspecified degradation product in the portion of Tablets taken:

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

r_U = peak response of any unspecified degradation product from the *Sample solution*

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

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

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

Acceptance criteria: See *Table 2*. The reporting threshold is 0.1%.

Table 2

Name	Relative Retention Time	Acceptance Criteria, NMT (%)
Etodolac	1.0	—
Etodolac related compound H (7-ethyltrypthanol)	1.1	0.3
Any unspecified degradation product	—	0.2
Total degradation products	—	1.0

▲ (USP 1-May-2024)

ADDITIONAL REQUIREMENTS

Change to read:

• **Packaging and Storage:** ▲Store at controlled room temperature in a tight, light-resistant container.▲ (USP 1-May-2024)

Change to read:

• **USP Reference Standards** ⟨11⟩

USP Etodolac RS

USP Etodolac Related Compound A RS

▲8-Ethyl-1-methyl-1,3,4,9-tetrahydropyrano [3,4-b]-indol-1-ylacetic acid.▲ (USP 1-May-2024)

$C_{16}H_{19}NO_3$ 273.33

▲ USP Etodolac Related Compound H RS

2-(7-Ethyl-1*H*-indol-3-yl)ethan-1-ol.

$C_{12}H_{15}NO$ 189.26▲ (USP 1-May-2024)

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

Topic/Question	Contact	Expert Committee
ETODOLAC TABLETS	Documentary Standards Support	SM22020 Small Molecules 2

Chromatographic Database Information: Chromatographic Database

Most Recently Appeared In:
Pharmacopeial Forum: Volume No. 47(5)

Current DocID: GUID-5B89E276-ACE3-4DCA-96AA-F3DAB1E6D50A_3_en-US

DOI: https://doi.org/10.31003/USPNF_M32376_03_01

DOI ref: t6wgf