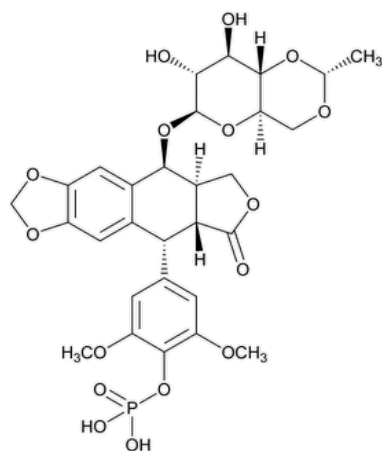


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Add the following:

▲Etoposide Phosphate



$C_{29}H_{33}O_{16}P$ 668.54

Furo[3',4':6,7]naphtho[2,3-d]-1,3-dioxol-6(5aH)-one, 5-[3,5-dimethoxy-4-(phosphonoxy)phenyl]-9-[(4,6-O-ethylidene-β-D-glucopyranosyl)oxy]-5,8,8a,9-tetrahydro-, [5R-[5α,5aβ,8aα,9β(R*)]]-; 4'-Demethylepipodophyllotoxin 9-[(4,6-O-(R)-ethylidene-β-D-glucopyranoside], 4'-(dihydrogen phosphate); (5R,5aR,8aR,9S)-9-[4,6-O-(R)-Ethylidene-β-D-glucopyranosyloxy]-5,8,8a,9-tetrahydro-5-[3,5-dimethoxy-4-(phosphonoxy)phenyl]furo[3',4':6,7]naphtho[2,3-d]-1,3-dioxol-6(5aH)-one CAS RN®: 117091-64-2; UNII: 528XYJ8L1N.

DEFINITION

Etoposide Phosphate contains NLT 97.5% and NMT 102.0% of etoposide phosphate ($C_{29}H_{33}O_{16}P$), calculated on the anhydrous and solvent-free basis.

[CAUTION—Etoposide phosphate is potentially cytotoxic. Great care should be taken to prevent inhaling particles and exposing the skin to it.]

IDENTIFICATION

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

Solution A: 2.3 g/L of [ammonium phosphate, monobasic](#) in [water](#)

Mobile phase: [Acetonitrile](#) and *Solution A* (15:85). Adjust with [phosphoric acid](#) to a pH of 2.5.

Standard solution: 0.24 mg/mL of [USP Etoposide Phosphate RS](#) in *Mobile phase*. Sonicate to assist with dissolution.

Sample solution: 0.24 mg/mL of Etoposide Phosphate in *Mobile phase*. Sonicate to assist with dissolution.

Chromatographic system

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

Mode: LC

Detector: UV 230 nm

Column: 4.6-mm × 15-cm; 5-μm packing [L11](#)

Flow rate: 1.5 mL/min

Injection volume: 25 μL

System suitability

Sample: *Standard solution*

Suitability requirements

Tailing factor: NMT 1.5

Relative standard deviation: NMT 0.73%

Analysis

Samples: *Standard solution and Sample solution*

Calculate the percentage of etoposide phosphate ($C_{29}H_{33}O_{16}P$) in the portion of Etoposide Phosphate taken:

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

r_U = peak response of etoposide phosphate from the *Sample solution*

r_S = peak response of etoposide phosphate from the *Standard solution*

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

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

Acceptance criteria: 97.5%–102.0% on the anhydrous and solvent-free basis

IMPURITIES

• ORGANIC IMPURITIES

Mobile phase, Sample solution, and Chromatographic system: Proceed as directed in the Assay.

Standard stock solution A: Use the *Standard solution* in the Assay.

Standard solution A: 0.24 µg/mL of [USP Etoposide Phosphate RS](#) in *Mobile phase*, from *Standard stock solution A*

Standard stock solution B: 0.024 mg/mL of [USP Etoposide RS](#) in [acetonitrile](#)

Standard solution B: 1.2 µg/mL of [USP Etoposide RS](#) in *Mobile phase*

Sensitivity solution: 0.12 µg/mL of [USP Etoposide Phosphate RS](#) in *Mobile phase*, from *Standard solution A*

System suitability

Samples: *Standard solution A, Standard solution B, and Sensitivity solution*

Suitability requirements

Relative standard deviation: NMT 10% for etoposide phosphate and etoposide, *Standard solution A* and *Standard solution B*

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

Analysis

Samples: *Sample solution, Standard solution A, and Standard solution B*

Calculate the percentage of etoposide and lignan P in the portion of Etoposide Phosphate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

r_U = peak area of etoposide or lignan P from the *Sample solution*

r_S = peak area of etoposide from *Standard solution B*

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

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

F = relative response factor (see [Table 1](#))

Calculate the percentage of lignan P phosphate and any individual unspecified impurity in the portion of Etoposide Phosphate taken:

$$\text{Result} = (r_U/r_S) \times (C_S/C_U) \times (1/F) \times 100$$

r_U = peak area of lignan P phosphate and any individual unspecified impurity from the *Sample solution*

r_S = peak area of etoposide phosphate from *Standard solution A*

C_S = concentration of [USP Etoposide Phosphate RS](#) in *Standard solution A* (mg/mL)

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