Edition: BP 2025 (Ph. Eur. 11.6 update)

Alpha Tocopheryl Succinate Tablets

General Notices

DEFINITION

Alpha Tocopheryl Succinate Tablets contain *RRR*-Alpha-Tocopheryl Hydrogen Succinate. They are coated.

The tablets comply with the requirements stated under Tablets and with the following requirements.

Content of α-tocopherol, $C_{29}H_{50}O_2$

95.0 to 105.0% of the stated amount.

IDENTIFICATION

A. Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions.
(1) Shake a quantity of the powdered tablets containing the equivalent of 0.134 g of α-tocopherol with three 10 mL quantities of *ether*, filter, evaporate the combined filtrates to 2 mL and then evaporate the solution to dryness under a current of nitrogen. Prepare a 0.5% w/v solution from a portion of the resulting residue in *cyclohexane*.
(2) Dissolve 10 mg of the residue obtained in the preparation of solution (1) in 2 mL of 5M *ethanolic sulfuric acid*, heat in a water bath for 1 minute, cool and add 2 mL each of *water* and *cyclohexane*. Shake for 1 minute, allow to separate and use the upper layer.
(3) 0.5% w/v of *RRR-α-tocopheryl succinate EPCRS* in *cyclohexane*.
(4) Prepare in the same manner as solution (2) but using 10 mg of *RRR-α-tocopheryl succinate EPCRS* in place of the substance being examined.

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel F_{254}*.
(b) Use the mobile phase as described below.
(c) Apply 10 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry in air and examine under *ultraviolet light (254 nm)*.

MOBILE PHASE

20 volumes of *ether* and 80 volumes of *cyclohexane*.

SYSTEM SUITABILITY

The test is not valid unless the chromatograms obtained with solutions (2) and (4) show two clearly separated spots.

CONFIRMATION

The principal spot in the chromatogram obtained with solution (1) is similar in position and size to that in the chromatogram obtained with solution (3).

Spray the plate with a mixture of 1 volume of *hydrochloric acid*, 4 volumes of a 0.25% w/v solution of *iron* (*III*) *chloride hexahydrate* in *ethanol* (*96%*) and 4 volumes of a 1% w/v solution of *1,10-phenanthroline hydrochloride* in *ethanol* (*96%*). In the chromatograms obtained with solutions (2) and (4) the spot of higher Rf value, due to α-tocopherol, is orange.

B. In the Assay the principal peak in the chromatogram obtained with solution (1) shows a peak with the same retention time as the peak due to the methylated alpha tocopheryl succinate in the chromatogram obtained with solution (2).

TESTS

Free tocopherol

Carry out the method for *thin-layer chromatography*, Appendix III A, using the following solutions.

(1) Shake a quantity of the powdered tablets containing the equivalent of 134 mg of α-tocopherol with three 10 mL quantities of *ether*, filter and evaporate the combined filtrates to 2 mL, evaporate the final solution to dryness under a current of nitrogen and prepare a 0.5% w/v solution from the resulting residue in *cyclohexane*.
(2) 0.005% w/v of *α-tocopherol BPCRS* in *cyclohexane*.

CHROMATOGRAPHIC CONDITIONS

(a) Use as the coating *silica gel* HF_{254} as the coating substance.
(b) Use the mobile phase as described below.
(c) Apply 10 µL of each solution.
(d) Develop the plate to 15 cm.
(e) After removal of the plate, dry in air and examine under *ultraviolet light (254 nm)*.

MOBILE PHASE

20 volumes of *ether* and 80 volumes of *cyclohexane*.

LIMITS

Any *secondary spot* in the chromatogram obtained with solution (1) is not more intense than the principal spot in the chromatogram obtained with solution (2) (1%).

ASSAY

Carry out the method for *gas chromatography*, Appendix III B. Dissolve 0.15 g of *dotriacontane* (internal standard) in sufficient *hexane* to produce 100 mL (solution A).

(1) Mix a quantity of the powdered tablets containing the equivalent of 134 mg of α-tocopherol with 20 mL of *methanol*, mix with the aid of ultrasound for 5 minutes and centrifuge for 15 minutes. To 4 mL of the clear supernatant liquid add 2 mL of *2,2-dimethoxypropane* and 0.2 mL of *hydrochloric acid* and allow to stand in the dark at room temperature for 1 hour. Evaporate to dryness on a water bath with the aid of a current of nitrogen and dissolve the residue in 10 mL of solution A.
(2) Dissolve 0.165 g of *RRR-α-tocopheryl succinate EPCRS* in 20 mL of *methanol*, add 2 mL of *2,2-dimethoxypropane* and 0.2 mL of *hydrochloric acid* and allow to stand in the dark at room temperature for 1 hour. Evaporate to dryness on a water bath with the aid of a current of nitrogen and dissolve the residue in 10 mL of solution A.

CHROMATOGRAPHIC CONDITIONS

(a) Use a borosilicate glass column (2 m × 4 mm) packed with *acid-washed, silanised diatomaceous support* (100 to 120 mesh) (Chromosorb W/AW is suitable) coated with 2 to 5% of polymethylsiloxane.
(b) Use a rate of flow of carrier gas at values such that the required resolution is achieved (40 mL per minute is suitable).
(c) Set the temperature of the column such that the required resolution is achieved (a column temperature of 280° is suitable).
(d) Maintain the temperature of the injection port at 290° and the detector at 350°.

SYSTEM SUITABILITY

The test is not valid unless, in the chromatogram obtained with solution (1), the retention times of dotriacontane and methyl α-tocopheryl succinate are about 8 minutes and 20 minutes, respectively.

DETERMINATION OF CONTENT

Calculate the content of $C_{29}H_{50}O_2$ from the areas of the peaks due to dotriacontane and methyl α-tocopheryl succinate in the chromatograms obtained with solution (1) and solution (2) and from the declared content of $C_{29}H_{50}O_2$ in *RRR-α-tocopheryl succinate EPCRS*.

STORAGE

Alpha Tocopheryl Succinate Tablets should be protected from light.

LABELLING

The quantity of active ingredient is stated in terms of the equivalent amount of α-tocopherol.