

Calculate the percentage content of $C_{27}H_{44}O_3$ from the declared content of *calcitriol CRS*.

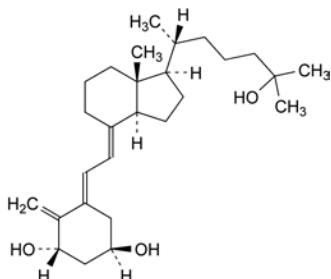
STORAGE

Under nitrogen, in an airtight container, protected from light, at a temperature of 2 °C to 8 °C.

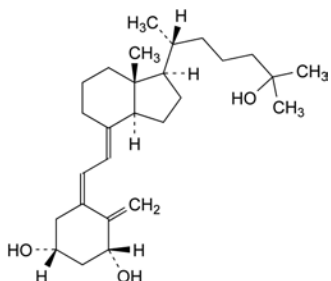
The contents of an opened container are to be used immediately.

IMPURITIES

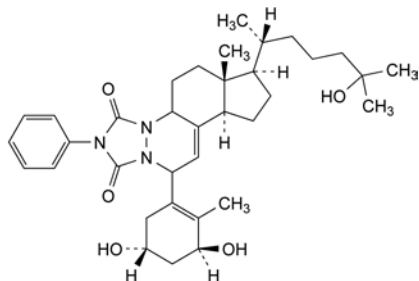
Specified impurities: A, B, C.



- A. (5*E*,7*E*)-9,10-secocholesta-5,7,10(19)-triene-1 α ,3 β ,25-triol (*trans*-calcitriol),



- B. (5*Z*,7*E*)-9,10-secocholesta-5,7,10(19)-triene-1 β ,3 β ,25-triol (1 β -calcitriol),



- C. (6*aR*,7*R*,9*aR*)-11-[(3*S*,5*R*)-3,5-dihydroxy-2-methylcyclohex-1-enyl]-7-[(1*R*)-5-hydroxy-1,5-dimethylhexyl]-6*a*-methyl-2-phenyl-5,6,6*a*,7,8,9,9*a*,11-octahydro-1*H*,4*aH*-cyclopenta[1,2,4]triazolo[1,2-*a*]cinnoline-1,3(2*H*)-dione (triazoline adduct of pre-calcitriol).

Solubility: freely soluble in water, slightly soluble in ethanol (96 per cent).

IDENTIFICATION

- A. It gives reaction (b) of calcium (2.3.1).
B. It gives reaction (b) of acetates (2.3.1).

TESTS

Solution S. Dissolve 5.0 g in *carbon dioxide-free water R* and dilute to 50.0 mL with the same solvent.

Appearance of solution. Solution S is clear (2.2.1) and colourless (2.2.2, *Method II*).

pH (2.2.3): 7.2 to 8.2.

Dilute 5.0 mL of solution S to 10.0 mL with *carbon dioxide-free water R*.

Readily oxidisable substances. Dissolve 2.0 g in boiling *water R* and dilute to 100 mL with boiling *water R*, add a few glass beads, 6 mL of 5 *M* *sulfuric acid* and 0.3 mL of 0.02 *M* *potassium permanganate*, mix, boil gently for 5 min and allow the precipitate to settle. The pink colour in the supernatant is not completely discharged.

Chlorides (2.4.4): maximum 330 ppm.

Dissolve 0.15 g in *water R* and dilute to 15 mL with the same solvent.

Fluorides: maximum 50 ppm.

Potentiometry (2.2.36, *Method I*).

Test solution. In a 50 mL volumetric flask, dissolve 0.200 g in a 10.3 g/L solution of *hydrochloric acid R*, add 5.0 mL of *fluoride standard solution (1 ppm F) R* and dilute to 50.0 mL with a 10.3 g/L solution of *hydrochloric acid R*. To 20.0 mL of the solution add 20.0 mL of *total-ionic-strength-adjustment buffer R* and 3 mL of an 82 g/L solution of *anhydrous sodium acetate R*. Adjust to pH 5.2 with *ammonia R* and dilute to 50.0 mL with *distilled water R*.

Reference solutions. To 0.25 mL, 0.5 mL, 0.75 mL and 1.0 mL of *fluoride standard solution (10 ppm F) R* add 20.0 mL of *total-ionic-strength-adjustment buffer R* and dilute to 50.0 mL with *distilled water R*.

Indicator electrode: fluoride selective.

Reference electrode: silver-silver chloride.

Take into account the addition of fluoride to the test solution for the calculation.

Nitrates. To 10.0 mL of solution S add 5 mg of *sodium chloride R*, 0.05 mL of *indigo carmine solution R* and add with stirring, 10 mL of *nitrogen-free sulfuric acid R*. The blue colour remains for at least 10 min.

Sulfates (2.4.13): maximum 600 ppm.

Dissolve 0.25 g in *distilled water R* and dilute to 15 mL with the same solvent.

Aluminium (2.4.17): maximum 1 ppm, if intended for use in the manufacture of peritoneal dialysis solutions, haemofiltration solutions or haemodialysis solutions.

Test solution. Dissolve 4.0 g of the substance to be examined in 100 mL of *water R* and add 10 mL of *acetate buffer solution pH 6.0 R*.

Reference solution. Mix 2 mL of *aluminium standard solution (2 ppm Al) R*, 10 mL of *acetate buffer solution pH 6.0 R* and 98 mL of *water R*.

Blank solution. Mix 10 mL of *acetate buffer solution pH 6.0 R* and 100 mL of *water R*.

Arsenic (2.4.2): maximum 3 ppm.

3.3 mL of solution S complies with test A.

Barium: maximum 50 ppm.

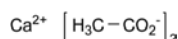
Atomic emission spectrometry (2.2.22, *Method II*).

Test solution. Dissolve 5.00 g of the substance to be examined in *water R* and dilute to 100.0 mL with the same solvent.

01/2011:2128

CALCIUM ACETATE, ANHYDROUS

Calcii acetas anhydricus



$C_4H_6CaO_4$
[62-54-4]

M_r 158.2

DEFINITION

Calcium diacetate.

Content: 99.0 per cent to 101.0 per cent (anhydrous substance).

CHARACTERS

Appearance: white or almost white, hygroscopic powder.

Reference solutions. Prepare the reference solutions using *barium standard solution (0.1 per cent Ba) R*, diluted as necessary with *water R*.

Wavelength: 455.4 nm.

Iron (2.4.9): maximum 20 ppm, if intended for use in the manufacture of parenteral preparations or haemodialysis solutions.

Dilute 5 mL of solution S to 10 mL of *water R*.

Magnesium: maximum 500 ppm.

Atomic absorption spectrometry (2.2.23, *Method II*).

Test solution. Dissolve 50.0 mg of the substance to be examined in *water R* and dilute to 100.0 mL with the same solvent.

Reference solutions. Prepare the reference solutions using *magnesium standard solution (0.1 per cent Mg) R*, diluted as necessary with *water R*.

Source: magnesium hollow-cathode lamp.

Wavelength: 285.2 nm.

Atomisation device: air-acetylene flame.

Potassium: maximum 500 ppm, if intended for use in the manufacture of parenteral preparations or haemodialysis solutions.

Atomic emission spectrometry (2.2.22, *Method II*).

Test solution. Dissolve 1.00 g of the substance to be examined in *water R* and dilute to 25.0 mL with the same solvent.

Reference solutions. Prepare the reference solutions using *potassium standard solution (0.2 per cent K) R*, diluted as necessary with *water R*.

Wavelength: 766.5 nm.

Sodium: maximum 500 ppm, if intended for use in the manufacture of parenteral preparations or haemodialysis solutions.

Atomic emission spectrometry (2.2.22, *Method II*).

Test solution. Dissolve 1.00 g of the substance to be examined in *water R* and dilute to 100.0 mL with the same solvent.

Reference solutions. Prepare the reference solutions using *sodium standard solution (200 ppm Na) R*, diluted as necessary with *water R*.

Wavelength: 589 nm.

Strontium: maximum 500 ppm, if intended for use in the manufacture of parenteral preparations or haemodialysis solutions.

Atomic emission spectrometry (2.2.22, *Method II*).

Test solution. Dissolve 2.00 g of the substance to be examined in *water R* and dilute to 100.0 mL with the same solvent.

Reference solutions. Prepare the reference solutions using *strontium standard solution (1.0 per cent Sr) R*, diluted as necessary with *water R*.

Wavelength: 460.7 nm.

Heavy metals (2.4.8): maximum 10 ppm.

Dissolve 4.0 g in *water R* and dilute to 20 mL with the same solvent. 12 mL of the solution complies with test A. Prepare the reference solution using *lead standard solution (2 ppm Pb) R*.

Water (2.5.12): maximum 7.0 per cent, determined on 0.100 g. Add 2 mL of *anhydrous acetic acid R* to the titration vessel in addition to the methanol. Clean the titration vessel after each determination.

ASSAY

Dissolve 0.150 g in 100 mL of *water R* and carry out the complexometric titration of calcium (2.5.11).

1 mL of 0.1 M *sodium edetate* is equivalent to 15.82 mg of $C_4H_6CaO_4$.

STORAGE

In an airtight container.

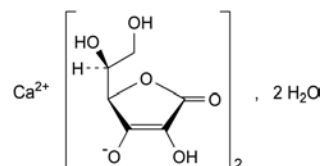
LABELLING

The label states, where applicable, that the substance is suitable for use in the manufacture of parenteral preparations, peritoneal dialysis solutions, haemofiltration solutions or haemodialysis solutions.

01/2008:1182
corrected 7.0

CALCIUM ASCORBATE

Calcii ascorbas



$C_{12}H_{14}CaO_{12} \cdot 2H_2O$
[5743-28-2]

M_r 426.3

DEFINITION

Calcium di[(R)-2-[(S)-1,2-dihydroxyethyl]-4-hydroxy-5-oxo-2H-furan-3-olate] dihydrate.

Content: 99.0 per cent to 100.5 per cent of $C_{12}H_{14}CaO_{12} \cdot 2H_2O$.

CHARACTERS

Appearance: white or slightly yellowish, crystalline powder.

Solubility: freely soluble in water, practically insoluble in ethanol (96 per cent).

IDENTIFICATION

First identification: A, B, E.

Second identification: A, C, D, E.

A. Specific optical rotation (see Tests).

B. Infrared absorption spectrophotometry (2.2.24).

Comparison: *Ph. Eur. reference spectrum of calcium ascorbate.*

C. Dilute 1 mL of solution S (see Tests) to 10 mL with *water R*. To 2 mL of the solution add 0.2 mL of a 100 g/L solution of *ferrous sulfate R*. A deep violet colour develops.

D. To 1 mL of solution S add 0.2 mL of *dilute nitric acid R* and 0.2 mL of *silver nitrate solution R2*. A grey precipitate is formed.

E. The substance gives reaction (b) of calcium (2.3.1).

TESTS

Solution S. Dissolve 5.00 g in *carbon dioxide-free water R* and dilute to 50.0 mL with the same solvent.

Appearance of solution. Solution S is clear (2.2.1) and not more intensely coloured than reference solution Y_6 (2.2.2, *Method II*). Examine the colour of the solution immediately after preparation of the solution.

pH (2.2.3): 6.8 to 7.4 for solution S.

Specific optical rotation (2.2.7): + 95 to + 97 (dried substance), determined using freshly prepared solution S.

Related substances. The thresholds indicated under Related substances (Table 2034.-1) in the general monograph *Substances for pharmaceutical use (2034)* do not apply.

Fluorides: maximum 10 ppm.

Potentiometry (2.2.36, *Method I*).

Test solution. In a 50 mL volumetric flask, dissolve 1.000 g in a 10.3 g/L solution of *hydrochloric acid R*, add 5.0 mL of *fluoride standard solution (1 ppm F) R* and dilute to 50.0 mL with a 10.3 g/L solution of *hydrochloric acid R*. To 20.0 mL of the solution add 20.0 mL of *total-ionic-strength-adjustment*