

IDENTIFICATION

A. It gives reaction (a) of bromides (2.3.1).
 B. Solution S (see Tests) gives the reactions of sodium (2.3.1).

TESTS

Solution S. Dissolve 10.0 g in *carbon dioxide-free water R* prepared from *distilled water R* and dilute to 100 mL with the same solvent.

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

Acidity or alkalinity. To 10 mL of solution S add 0.1 mL of *bromothymol blue solution R1*. Not more than 0.5 mL of 0.01 M *hydrochloric acid* or 0.01 M *sodium hydroxide* is required to change the colour of the indicator.

Bromates. To 10 mL of solution S add 1 mL of *starch solution R*, 0.1 mL of a 100 g/L solution of *potassium iodide R* and 0.25 mL of 0.5 M *sulfuric acid* and allow to stand protected from light for 5 min. No blue or violet colour develops.

Chlorides: maximum 0.6 per cent.

In a conical flask, dissolve 1.000 g in 20 mL of *dilute nitric acid R*. Add 5 mL of *strong hydrogen peroxide solution R* and heat on a water-bath until the solution is completely decolourised. Wash down the sides of the flask with a little *water R* and heat on a water-bath for 15 min. Allow to cool, dilute to 50 mL with *water R* and add 5.0 mL of 0.1 M *silver nitrate* and 1 mL of *dibutyl phthalate R*. Shake and titrate with 0.1 M *ammonium thiocyanate*, using 5 mL of *ferric ammonium sulfate solution R2* as indicator. Not more than 1.7 mL of 0.1 M *silver nitrate* is used. Note the volume of 0.1 M *silver nitrate* used (see Assay). Carry out a blank test.

Iodides. To 5 mL of solution S add 0.15 mL of *ferric chloride solution R1* and 2 mL of *methylene chloride R*. Shake and allow to separate. The lower layer is colourless (2.2.2, *Method I*).

Sulfates (2.4.13): maximum 100 ppm.

15 mL of solution S complies with the limit test for sulfates.

Iron (2.4.9): maximum 20 ppm.

5 mL of solution S diluted to 10 mL with *water R* complies with the limit test for iron.

Magnesium and alkaline-earth metals (2.4.7): maximum 200 ppm, calculated as Ca.

10.0 g complies with the limit test for magnesium and alkaline-earth metals. The volume of 0.01 M *sodium edetate* used does not exceed 5.0 mL.

Heavy metals (2.4.8): maximum 10 ppm.

12 mL of solution S complies with limit test A. Prepare the standard using *lead standard solution (1 ppm Pb) R*.

Loss on drying (2.2.32): maximum 3.0 per cent, determined on 1.000 g by drying in an oven at 105 °C for 3 h.

ASSAY

Dissolve 2.000 g in *water R* and dilute to 100.0 mL with the same solvent. To 10.0 mL of the solution add 50 mL of *water R*, 5 mL of *dilute nitric acid R*, 25.0 mL of 0.1 M *silver nitrate* and 2 mL of *dibutyl phthalate R*. Shake. Titrate with 0.1 M *ammonium thiocyanate*, using 2 mL of *ferric ammonium sulfate solution R2* as indicator and shaking vigorously towards the end-point.

1 mL of 0.1 M *silver nitrate* is equivalent to 10.29 mg of NaBr. Calculate the percentage content of NaBr from the expression:

$$a - 2.902 b$$

a = percentage content of NaBr and NaCl obtained in the assay and calculated as NaBr,

b = percentage content of Cl in the test for chlorides.

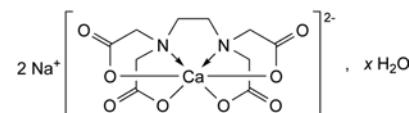
STORAGE

In an airtight container.

01/2008:0231

SODIUM CALCIUM EDETALE

Natrii calcii edetas



$C_{10}H_{12}CaN_2Na_2O_8 \cdot xH_2O$ M_r 374.3 (anhydrous substance) [62-33-9]

DEFINITION

Disodium [(ethylenedinitrilo)tetraacetato]calcinate(2-).

Content: 98.0 per cent to 102.0 per cent (anhydrous substance). It contains a variable amount of water of crystallisation.

CHARACTERS

Appearance: white or almost white, hygroscopic powder.

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

IDENTIFICATION

First identification: A, C, D.

Second identification: B, C, D.

A. Infrared absorption spectrophotometry (2.2.24).

Preparation: discs.

Comparison: sodium calcium edetate CRS.

B. Dissolve 2 g in 10 mL of *water R*, add 6 mL of *lead nitrate solution R*, shake and add 3 mL of *potassium iodide solution R*. No yellow precipitate is formed. Make alkaline to *red litmus paper R* by the addition of *dilute ammonia R2* and add 3 mL of *ammonium oxalate solution R*. A white precipitate is formed.

C. Ignite. The residue gives reaction (b) of calcium (2.3.1).

D. Dissolve 0.5 g in 10 mL of *water R* and add 10 mL of *potassium pyroantimonate solution R*. A white, crystalline precipitate is formed. The formation of the precipitate is accelerated by rubbing the wall of the tube with a glass rod.

TESTS

Solution S. Dissolve 5.0 g in *water R* and dilute to 100 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): 6.5 to 8.0.

Dissolve 5.0 g in *carbon dioxide-free water R* and dilute to 25 mL with the same solvent.

Impurity A. Liquid chromatography (2.2.29). *Carry out the test protected from light.*

Solvent mixture. Dissolve 10.0 g of *ferric sulfate pentahydrate R* in 20 mL of 0.5 M *sulfuric acid* and add 780 mL of *water R*. Adjust to pH 2.0 with 1 M *sodium hydroxide* and dilute to 1000 mL with *water R*.

Test solution. Dissolve 0.100 g of the substance to be examined in the solvent mixture and dilute to 25.0 mL with the solvent mixture.

Reference solution. Dissolve 40.0 mg of *nitrilotriacetic acid R* (impurity A) in the solvent mixture and dilute to 100.0 mL with the solvent mixture. To 1.0 mL of this solution add 0.1 mL of the test solution and dilute to 100.0 mL with the solvent mixture.

Column:

— size: $l = 0.10$ m, $\emptyset = 4.6$ mm;

- *stationary phase*: spherical graphitised carbon for chromatography R1 (5 µm) with a specific surface area of 120 m²/g and a pore size of 25 nm.

Mobile phase: dissolve 50.0 mg of ferric sulfate pentahydrate R in 50 mL of 0.5 M sulfuric acid and add 750 mL of water R; adjust to pH 1.5 with 0.5 M sulfuric acid or 1 M sodium hydroxide, add 20 mL of ethylene glycol R and dilute to 1000 mL with water R.

Flow rate: 1 mL/min.

Detection: spectrophotometer at 273 nm.

Injection: 20 µL; filter the solutions and inject immediately.

Run time: 4 times the retention time of the iron complex of impurity A.

Retention time: iron complex of impurity A = about 5 min; iron complex of edetic acid = about 10 min.

System suitability: reference solution:

- *resolution*: minimum 7 between the peaks due to the iron complex of impurity A and the iron complex of edetic acid;
- *signal-to-noise ratio*: minimum 50 for the peak due to impurity A.

Limit:

- *impurity A*: not more than the area of the corresponding peak in the chromatogram obtained with the reference solution (0.1 per cent).

Disodium edetate: maximum 1.0 per cent.

Dissolve 5.0 g in 250 mL of water R. Add 10 mL of ammonium chloride buffer solution pH 10.0 R and about 50 mg of mordant black 11 triturate R. Not more than 1.5 mL of 0.1 M magnesium chloride is required to change the colour of the indicator to violet.

Chlorides: maximum 0.1 per cent.

Dissolve 0.7 g in water R and dilute to 20 mL with the same solvent. Add 30 mL of dilute nitric acid R, allow to stand for 30 min and filter. Dilute 10 mL of the filtrate to 50 mL with water R. Use this solution as the test solution. Prepare the reference solution using 0.40 mL of 0.01 M hydrochloric acid, add 6 mL of dilute nitric acid R and dilute to 50 mL with water R. Filter both solutions if necessary. Add 1 mL of silver nitrate solution R2 to the test solution and to the reference solution and mix. After standing for 5 min protected from light, any opalescence in the test solution is not more intense than that in the reference solution.

Iron (2.4.9): maximum 80 ppm.

Dilute 2.5 mL of solution S to 10 mL with water R. Add 0.25 g of calcium chloride R to the test solution and the standard before the addition of the thioglycollic acid R.

Heavy metals (2.4.8): maximum 20 ppm.

1.0 g complies with test F. Prepare the reference solution using 2 mL of lead standard solution (10 ppm Pb) R.

Water (2.5.12): 5.0 per cent to 13.0 per cent, determined on 0.200 g.

ASSAY

Dissolve 0.500 g in water R and dilute to 200 mL with the same solvent. To 20.0 mL of this solution, add 80 mL of water R and adjust to pH 2 with dilute nitric acid R. Titrate with 0.01 M bismuth nitrate, using 0.1 mL of a 1 g/L solution of xlenol orange R as indicator. The colour of the solution changes from yellow to red.

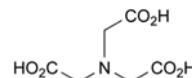
1 mL of 0.01 M bismuth nitrate is equivalent to 3.74 mg of C₁₀H₁₂CaN₂Na₂O₈.

STORAGE

In an airtight container, protected from light.

IMPURITIES

Specified impurities: A.

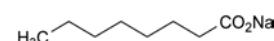


A. nitrilotriacetic acid.

01/2008:1471
corrected 6.0

SODIUM CAPRYLATE

Natrii caprylas



M_r 166.2

C₈H₁₅NaO₂
[1984-06-1]

DEFINITION

Sodium octanoate.

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

CHARACTERS

Appearance: white or almost white, crystalline powder.

Solubility: very soluble or freely soluble in water, freely soluble in acetic acid, sparingly soluble in ethanol (96 per cent), practically insoluble in acetone.

IDENTIFICATION

A. Examine the chromatograms obtained in the test for related substances.

Results: the principal peak in the chromatogram obtained with the test solution is similar in retention time and size to the principal peak in the chromatogram obtained with reference solution (a).

B. To 0.2 mL of solution S (see Tests) add 0.3 mL of water R. The solution gives reaction (b) of sodium (2.3.1).

TESTS

Solution S. Dissolve 2.5 g in carbon dioxide-free water R and dilute to 25 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): 8.0 to 10.5 for solution S.

Related substances. Gas chromatography (2.2.28): use the normalisation procedure.

Test solution. Dissolve 0.116 g in water R and dilute to 5 mL with the same solvent. Add 1 mL of a 2.8 per cent V/V solution of sulfuric acid R and shake with 10 mL of ethyl acetate R. Separate the organic layer and dry over anhydrous sodium sulfate R.

Reference solution (a). Dissolve 0.10 g of caprylic acid CRS in ethyl acetate R and dilute to 10 mL with the same solvent.

Reference solution (b). Dilute 1 mL of the test solution to 100 mL with ethyl acetate R. Dilute 5 mL of this solution to 50 mL with ethyl acetate R.

Column:

- *material*: fused silica;
- *size*: l = 30 m, Ø = 0.25 mm;
- *stationary phase*: macrogol 20 000 2-nitroterephthalate R (film thickness 0.25 µm).

Carrier gas: helium for chromatography R.

Flow rate: 1.5 mL/min.

Split ratio: 1:100.