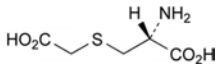
01/2008:0885
corrected 6.0

CARBOCISTEINE

Carbocisteinum



$C_5H_9NO_4S$ M_r 179.2
[638-23-3]

DEFINITION

Carbocisteine contains not less than 98.5 per cent and not more than the equivalent of 101.0 per cent of (2*R*)-2-amino-3-[(carboxymethyl)sulfanyl]propanoic acid, calculated with reference to the dried substance.

CHARACTERS

A white or almost white, crystalline powder, practically insoluble in water and in alcohol. It dissolves in dilute mineral acids and in dilute solutions of alkali hydroxides.

IDENTIFICATION

First identification: A, B.

Second identification: A, C, D.

A. Specific optical rotation (see Tests).

B. Examine by infrared absorption spectrophotometry (*2.2.24*), comparing with the spectrum obtained with *carbocisteine CRS*. Examine the substances prepared as discs.

C. Examine the chromatograms obtained in the test for ninhydrin-positive substances. The principal spot in the chromatogram obtained with test solution (b) is similar in position, colour and size to the principal spot in the chromatogram obtained with reference solution (a).

D. Dissolve 0.1 g in 4.5 mL of *dilute sodium hydroxide solution R*. Heat on a water-bath for 10 min. Cool and add 1 mL of a 25 g/L solution of *sodium nitroprusside R*. A dark red colour is produced, which changes to brown and then to yellow within a few minutes.

TESTS

Solution S. Disperse 5.00 g in 20 mL of *water R* and add dropwise with shaking 2.5 mL of *strong sodium hydroxide solution R*. Adjust to pH 6.3 with *1 M sodium hydroxide* and dilute to 50.0 mL with *water R*.

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

pH (*2.2.3*). Shake 0.2 g with 20 mL of *carbon dioxide-free water R*. The pH of the suspension is 2.8 to 3.0.

Specific optical rotation (*2.2.7*): – 32.5 to – 35.5, determined on solution S and calculated with reference to the dried substance.

Ninhydrin-positive substances. Examine by thin-layer chromatography (*2.2.27*), using a suitable silica gel as the coating substance.

Test solution (a). Dissolve 0.10 g of the substance to be examined in *dilute ammonia R2* and dilute to 10 mL with the same solvent.

Test solution (b). Dilute 1 mL of test solution (a) to 50 mL with *water R*.

Reference solution (a). Dissolve 10 mg of *carbocisteine CRS* in *dilute ammonia R2* and dilute to 50 mL with the same solvent.

Reference solution (b). Dilute 5 mL of test solution (b) to 20 mL with *water R*.

Reference solution (c). Dissolve 10 mg of *carbocisteine CRS* and 10 mg of *arginine hydrochloride CRS* in 5 mL of *dilute ammonia R2* and dilute to 25 mL with *water R*.

Apply separately to the plate 5 µL of each solution. Allow the plate to dry in air. Develop over a path of 15 cm using a mixture of 20 volumes of *glacial acetic acid R*, 20 volumes of *water R* and 60 volumes of *butanol R*. Dry the plate in a current of warm air. Spray with *ninhydrin solution R* and heat at 100 °C to 105 °C for 15 min. Any spot in the chromatogram obtained with test solution (a), apart from the principal spot, is not more intense than the spot in the chromatogram obtained with reference solution (b) (0.5 per cent). The test is not valid unless the chromatogram obtained with reference solution (c) shows two clearly separated principal spots.

Chlorides (*2.4.4*). Dissolve 33 mg in 5 mL of *dilute nitric acid R* and dilute to 15 mL with *water R*. The solution, without further addition of nitric acid, complies with the limit test for chlorides (0.15 per cent).

Sulfates (*2.4.13*). Dissolve 0.5 g in 5 mL of *dilute hydrochloric acid R* and dilute to 15 mL with *distilled water R*. The solution complies with the limit test for sulfates (300 ppm).

Heavy metals (*2.4.8*). 2.0 g complies with limit test D for heavy metals (10 ppm). Prepare the standard using 2 mL of *lead standard solution (10 ppm Pb) R*.

Loss on drying (*2.2.32*). Not more than 0.5 per cent, determined on 1.000 g by drying in an oven at 105 °C for 2 h.

Sulfated ash (*2.4.14*). Not more than 0.3 per cent, determined on 1.0 g.

ASSAY

Dissolve 0.150 g in 10 mL of *anhydrous formic acid R* with slight heating and shake until dissolution is complete. Add 50 mL of *anhydrous acetic acid R*. Titrate with *0.1 M perchloric acid*, determining the end-point potentiometrically (*2.2.20*).

1 mL of *0.1 M perchloric acid* is equivalent to 17.92 mg of $C_5H_9NO_4S$.

STORAGE

Store protected from light.

04/2009:1299

CARBOMERS

Carbomera

DEFINITION

High-molecular-mass polymers of acrylic acid cross-linked with alkenyl ethers of sugars or polyalcohols.

Content: 56.0 per cent to 68.0 per cent of carboxylic acid (-CO_2H) groups (dried substance).

CHARACTERS

Appearance: white or almost white, fluffy, hygroscopic powder.

Solubility: swells in water and in other polar solvents after dispersion and neutralisation with sodium hydroxide solution.

IDENTIFICATION

First identification: A.

Second identification: B, C, D.

A. Infrared absorption spectrophotometry (*2.2.24*).
Main bands: at 1710 ± 5 cm^{-1}, 1454 ± 5 cm^{-1}, 1414 ± 5 cm^{-1}, 1245 ± 5 cm^{-1}, 1172 ± 5 cm^{-1}, 1115 ± 5 cm^{-1} and 801 ± 5 cm^{-1}, with the strongest band at 1710 ± 5 cm^{-1}.

B. Adjust a 10 g/L dispersion to about pH 7.5 with *1 M sodium hydroxide*. A highly viscous gel is formed.

C. Add 2 mL of a 100 g/L solution of *calcium chloride R*, with continuous stirring, to 10 mL of the gel from identification test B. A white precipitate is immediately produced.

D. Add 0.5 mL of *thymol blue solution R* to 10 mL of a 10 g/L dispersion. An orange colour is produced. Add 0.5 mL of *cresol red solution R* to 10 mL of a 10 g/L dispersion. A yellow colour is produced.