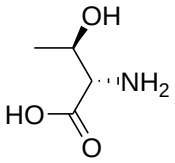
Threonine

L-Threonine



$C_4H_9NO_3$ Mol. Wt. 119.1

Threonine contains not less than 98.5 per cent and not more than 101.5 per cent of $C_4H_9NO_3$, calculated on the dried basis.

Category. Amino acid

Description. A white crystals.

Identification

Determine by infrared absorption spectrophotometry (2.4.6). Compare the spectrum with that obtained with *L-threonine RS* or with the reference spectrum of L-threonine.

Tests

pH (2.4.24). 5.0 to 6.5, determined in a 5 per cent w/v solution.

Specific optical rotation (2.4.22). – 29.1° to – 26.7°, determined in a 6 per cent w/v solution in *water*.

Related substances. Determine by thin-layer chromatography (2.4.17), coating the plate with *silica gel G.*

Mobile phase. A mixture of 30 volumes of *butyl alcohol,* 10 volumes of *glacial acetic acid* and 10 volumes of *water.*

Test solution. Dissolve 100 mg of the substance under examination in 10 ml of *2 M hydrochloric acid.*

Reference solution (a). A 0.005 per cent w/v solution of *L-threonine RS* in 1 per cent v/v solution of *hydrochloric acid.*

Reference solution (b). A 0.04 per cent w/v solution each of *L- threonine RS* and *L-proline RS* in 1 per cent v/v solution of *hydrochloric acid.*

Apply to the plate 5 µl of each solution. Dry the plate in air and spray the plate with a 0.2 per cent w/v solution of *ninhydrin* in a mixture of 95 volumes of *butyl alcohol* and 5 volumes of *2 M acetic acid* and heat the plate at 105° for 15 minutes. Cool and examine in daylight. Any secondary spot in the chromatogram obtained with the test solution is not larger or more intense than the principal spot in the chromatogram obtained with reference solution (a). The test is not valid unless the chromatogram obtained with reference solution (b) shows two clearly separated spots.

Iron (2.3.14). 1.33 g complies with the limit test for iron (30 ppm).

Chlorides (2.3.12). 0.5 g complies with the limit test for chlorides (500 ppm).

Sulphates (2.3.17). 0.5 g complies with the limit test for sulphates (300 ppm).

Sulphated ash (2.3.18). Not more than 0.4 per cent.

Loss on drying (2.4.19). Not more than 0.2 per cent, drying in an oven at 105° for 3 hours.

Assay. Dissolve 110 mg of the substance under examination, in a mixture of 3 ml of *formic acid* and 50 ml of *glacial acetic acid* and titrate with *0.1 M perchloric acid*, determining the end-point potentiometrically (2.4.25). Carry out a blank titration.

1 ml of *0.1 M perchloric acid* is equivalent to 0.01191 g of $C_4H_9NO_3$.

Storage. Store protected from moisture.

Solubility. Freely soluble in *water*; insoluble in *ethanol*, in *ether*, and in *chloroform*.