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The determination of α -amino nitrogen in sugar beet

甜菜中 α -氨基氮的测定

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The determination of α -amino nitrogen in sugar beet

1 Scope

This standard specifies the determination method for α -amino nitrogen in sugar beet.

This standard applies to the determination of α -amino nitrogen in sugar beet.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 6682 Water for analytical laboratory use - Specification and test methods

3 Principle

In a slightly acidic (pH 6.0) copper salt solution, α -amino nitrogen forms a blue complex with copper ions; the depth of the blue color is proportional to the content of α -amino nitrogen. It is subject to colorimetric quantitation at a wavelength of 580 nm, to determine the content of α -amino nitrogen.

4 Reagent

Unless otherwise specified, all reagents used are of analytical pure.

4.1 Water

It shall meet the requirements of grade-3 water in GB/T 6682.

4.2 Alkaline lead acetate solution

Basic lead acetate solution: The density is (1.24 ± 0.01) g/mL; each 100 mL contains 9.5 g ~ 10.5 g of alkaline lead salt (calculated as PbO).

4.3 Diluted basic lead acetate solution

balance which has a balance of 0.01 g. Transfer the mixture of the beet paste and the paste paper to the high-speed tissue masher. Add (177.0 ± 0.35) mL of basic lead acetate dilute solution (4.3). Cover the masher. Turn on the stirring motor. Dip it at 12000 r/min ~ 15000 r/min for 3 min (temperature 20 °C). Filter it. Take a clear solution to prepare for use.

7 Determination

Accurately pipette 50 mL of the sample extract into a 100 mL volumetric flask. Use distilled water to dissolve it and make the volume reach to the mark. Then pipette 25 mL of the solution into a 250 mL beaker.

Pipette 0 mL, 5 mL, 10 mL, 20 mL, 30 mL, 40 mL, 50 mL, respectively, of standard amino nitrogen solution in a 100 mL volumetric flask. Use distilled water to dissolve and make its volume reach to the mark. These solutions respectively contain α -amino nitrogen of 0 mg/100 mL, 1.3 mg/100 mL, 2.6 mg/100 mL, 5.2 mg/100 mL, 7.8 mg/100 mL, 10.4 mg/100 mL, 13 mg/100 mL, respectively. Pipette 25 mL of the standard solution into a 250 mL beaker.

Add 25 mL sodium acetate solution and 10 mL copper reagent to the test solution and standard solution, respectively. After mixing, use a 5 cm cuvette to adjust the zero point with distilled water. At a wavelength of 580 nm, measure the absorbance and draw a standard curve for comparison .

8 Calculation

The formula for calculating the content of α -amino nitrogen in the specimen:

$$X = \frac{A}{m} \times 100 \dots\dots\dots (1)$$

Where:

X - The content of α -amino nitrogen in the specimen, in milligrams per hundred grams (mg/100 g)

A - The mass of α -amino nitrogen in the sample solution for determination, in milligrams (mg);

m - The mass of the specimen, in grams (g).

It is expressed as the arithmetic mean of two independent determination results obtained under repeatability conditions, retaining 3 significant digits.

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