

ICS 65.120
CCS B46



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 7300.103-2020

Replacing GB/T 19371.1-2003

**Feed additives - Part 1: Amino acids, their salts and analogues -
Methionine hydroxy analogue**

饲料添加剂 第1部分：氨基酸、氨基酸盐及其类似物 蛋氨酸羟基类似物

Issued on: May 29, 2020

Implemented on: December 1, 2020

**Issued by: State Administration for Market Regulation;
Standardization Administration of China**

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1 Scope

GB 7300.103-2020 is the Chinese national standard on feed additives - part 1: amino acids, their salts and analogues - methionine hydroxy analogue, in the field of agriculture. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 29 May 2020 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 December 2020. Classification: ICS 65.120, CCS B46. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This part of GB 7300 specifies the requirements, test methods, inspection rules and labeling, packaging, transportation, storage, and shelf life requirements for feed additives methionine hydroxy analogues. This part applies to feed additives methionine hydroxy analogues produced by chemical synthesis with acrolein, methyl mercaptan, and hydrogen

cyanide used as the main raw materials. Chemical name: 2-Hydroxy-4-(methylthio)butyric acid Molecular formula: $C_5H_{10}O_3S$ Relative molecular mass: 150.2 (in $C_5H_{10}O_3S$, calculated according to the 2016 International Standard Relative Atomic Mass)

2 Normative references

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

GB/T 601 Chemical reagent - Preparations of reference titration solutions

GB/T 602 Chemical reagent - Preparations of standard solutions for impurity

GB/T 603 Chemical reagent - Preparations of reagent solutions for use in test methods

GB/T 6680 General rules for sampling liquid chemical products

GB/T 6682 Water for analytical laboratory use - Specification and test methods GB 10648 Feed label

GB/T 13079-2006 Determination of total arsenic in feeds 4.2.1.3 2,7-Dihydroxynaphthalene.

4.2.1.4 Anhydrous copper sulfate saturated sulfuric acid solution: Take anhydrous copper sulfate (4.2.1.1), add sulfuric acid (4.2.1.2) and stir until it is insoluble. 4.2.1.5

2,7-dihydroxynaphthalene sulfuric acid solution: 0.01%; weigh

0.01 g of 2,7- dihydroxynaphthalene (4.2.1.3), dissolve it with sulfuric acid (4.2.1.2) and make up the volume to 100 mL, and newly prepare it when it will be used.

4.2.2 Identification test

4.2.2.1 Take 25 mg of this product and put it into a dry test tube, add 1 mL of anhydrous copper sulfate saturated sulfuric acid solution (4.2.1.4), the solution immediately turns yellow, and then turns yellow-green.

4.2.2.2 Take 1 drop of this product and put it into a dry test tube, add the newly prepared 2,7-dihydroxynaphthalene sulfuric acid solution (4.2.1.5), put the tube in a boiling water bath and boil for 10 min~15 min, and then the color turns from yellow to reddish brown.

4.3 Determination of content of methionine hydroxy analogues

4.3.1 Principle In an acidic medium, methionine hydroxy analogues undergo the following redox reactions: $3C_4H_6O_3SCH_3 + BrO \rightarrow 3C_4H_6O_3SOCH_3 + Br$ The color change of bromine can be used to judge the end point of the reaction.

4.3.2 Reagents

4.3.2.1 Potassium bromate.

4.3.2.2 Potassium bromide.

4.3.2.3 Potassium iodide.

4.3.2.4 Hydrochloric acid.

4.3.2.5 Hydrochloric acid solution: hydrochloric acid + water = 1 + 1.

4.3.2.6 Acid solution: glacial acetic acid + water + concentrated hydrochloric acid = 50 + 10 + 3.

4.3.2.7 Sodium thiosulfate standard titration solution: $c(\text{Na}_2\text{S}_2\text{O}_3) =$

0.1 mol/L (according to the provision of GB/T 601).

4.5.1.2 Nitric acid.

4.5.1.3 Hydrochloric acid.

4.5.1.4 Lead standard solution: 1000 $\mu\text{g/mL}$; weigh 0.1599 g of lead nitrate, put it in a 1000 mL measuring bottle, add 5 mL of nitric acid and 50 mL of water to dissolve; dilute with water to the mark, shake well, and use it as a stock solution (according to the provisions of GB/T 602); or use a commercially available lead single-element standard solution of 1000 $\mu\text{g/mL}$.

4.5.1.5 Ammonia solution (10%): Take 40 mL of ammonia water, add an appropriate amount of water to make up to 100 mL, and shake well (prepared according to GB/T 603).

4.5.1.6 Hydrochloric acid solution I: Take 63 mL of hydrochloric acid, add an appropriate amount of water to make up to 100 mL, and shake well.

4.5.1.7 Hydrochloric acid solution II: Take 18 mL of hydrochloric acid, add water to make up to 100 mL, and shake well.

4.5.1.8 Sodium sulfide solution: Take 100 g of sodium sulfide and add water to dissolve it into 1000 mL.

4.5.1.9 Acetate buffer solution (pH 3.5): Take 25 g of ammonium acetate, add 25 mL of water to dissolve, add 38 mL of hydrochloric acid solution I (4.5.1.6), and use hydrochloric acid solution II (4.5.1.7) or ammonia solution (4.5.1.5) to accurately adjust the pH value to 3.5 (indicated by the potentiometer); dilute to 100 mL with water, and shake well.

4.5.1.10 Phenolphthalein indicator solution: Take 1 g of phenolphthalein, add 100 mL of ethanol to dissolve it, and then the solution is obtained (prepared according to

GB/T 603). The range of discoloration is pH 8.3~10.0 (colorless->red).

4.5.1.11 Preparation of lead standard working solution: Accurately measure 2 mL of lead standard solution (4.5.1.4), put it in a 200 mL measuring bottle, dilute with water to the mark, and shake well (each mL solution is equivalent to 10 µg of Pb).

4.5.2 Analysis steps

4.5.2.1 Sample solution preparation Weigh 1 g of the sample (accurate to 10 mg), place it in a porcelain crucible, blaze slowly until it is completely carbonized, and let it cool. Add

0.5 mL~1 mL of sulfuric acid (4.5.1.1) to make it moist, heat at low temperature until the sulfuric acid vapor is completely removed, burn it at 550 °C to make it completely ash, and let it cool. Add

0.5 mL of nitric acid (4.5.1.2), evaporate to dryness until the nitrogen oxide vapor is completely removed, and let it cool. Add

2.0 mL of hydrochloric acid (4.5.1.3), evaporate to dryness on a water bath, and add 15 mL of water; add dropwise ammonia solution (4.5.1.5) until it reacts to phenolphthalein indicator solution (4.5.1.10) and the solution turns slightly red, and then add

2.0 mL of acetate buffer (4.5.1.9); after slightly heating to dissolve, transfer the solution to a Nessler colorimetric tube, add water to dilute it to 25 mL, which is used as tube B.

4.5.2.2 Preparation of standard colorimetric solution Take another reagent for preparing the sample solution, evaporate it to dryness in a porcelain crucible, add

2.0 mL of acetate buffer solution (4.5.1.9) and 15 mL of water; after slightly heating to dissolve, transfer the solution to a Nessler colorimetric tube, add

1.00 mL of lead standard working solution (4.5.1.11), and then dilute it with water to 25 mL, which is used as tube A.

4.5.3 Measurement and result judgment Add 5 drops of sodium sulfide solution (4.5.1.8) to tubes A and B respectively, shake well, and let them stand for 2 minutes; place them on white paper, see through from top to bottom, and compare the colors of tubes A and B with naked eyes. If the color in tube B is not darker than that in tube A, it is judged that the requirements are met.

4.6.1 Reagents

4.6.1.1 Magnesium oxide.

4.6.1.2 Hydrochloric acid solution: hydrochloric acid + water = 1 + 3 (volume ratio).

4.6.1.3 Sodium hydroxide solution: 10%.

4.6.1.4 Saturated aqueous solution of mercuric chloride: Add mercuric chloride into water