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

GB 21694-2017

Replacing GB/T 21694-2008

Feed additive-Zinc methionine complex (chelate)

饲料添加剂 蛋氨酸锌络(螯)合物

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19.0	Methionine /% ≥78.0 ≥

Foreword

The first chapter of this standard, Chapter 3 and Chapter 5 is mandatory, the rest are recommended. This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard replaces GB/T 21694-2008 "feed additive methionine zinc." This standard compared with GB/T 21694-2008, the main technical differences are as follows:

--- "Sensory traits" to "appearance and traits."

--- Increase the molar ratio of 1. 1 methionine zinc complex (chelate) chelation rate index.

--- Molar ratio of 2. 1 zinc methionine (chelate) the moisture content of less than or equal to 5% modified to less than or equal to 2%; Total arsenic content from less than or equal to 8mg/kg to less than or equal to 5mg/kg, lead content from less than or equal to 10mg/kg modified to less than or equal to 5mg/kg, cadmium content from less than or equal to 10mg/kg modified to less than or equal to 6mg/kg. This standard is proposed and managed by the National Feed Industry Standardization Technical Committee (SAC/TC76). This standard drafting unit. Chinese Academy of Agricultural Sciences Beijing Institute of Animal Husbandry and Veterinary, National Feed Quality Supervision and Inspection Center (Wuhan), Nanning City Zellweger Feed Co., Ltd., Guangzhou days Branch Technology Co., Ltd. The main drafters of this standard. Luo Xu Gang, Lu Lin, Zhu Yongwen, Zhang Liyang, Zhang Ling, Jie Jing Jing, Yang Lin, Zhou Jianqun, Teng Bing. This standard replaces the standards previously issued as.

--- GB/T 21694-2008. Feed additive methionine zinc (chelate) complexes

1 Scope

GB 21694-2017 is the Chinese national standard on feed additive-zinc methionine complex (chelate), 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 14 October 2017 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 May 2018. 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 standard specifies the requirements of feed additive methionine zinc (chelate) compounds, test methods, inspection rules and labeling, packaging, transportation, Storage and shelf life. This standard applies to zinc sulfate and methionine (2-amino-4-methylthio-butyric acid) synthesized in a molar ratio of 2. 1 or 1. 1 methionine Zinc (chelate) products. The molar ratio of 2. 1 methionine zinc complex (chelate) molecular formula .C₁₀H₂₀N₂O₄S₂Zn, relative molecular mass of 361.80. Molecular formula. (C₅H₁₀NO₂SZn) HSO₄, relative molecular weight 310.65 2007 International relative atomic mass meter).

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 601 chemical reagent standard titration solution preparation

GB/T 5917.1 forage particle size determination two sieve screening method

GB/T 6435 Determination of moisture in feed

GB/T 6682 analytical laboratory water specifications and test methods

GB 10648 feed label Determination of total arsenic in feedstuffs

GB/T 13079-2006 Feedstuffs - Determination of lead - Atomic absorption spectrometry

GB/T 13080-2004

GB/T 13080.2 feed additive methionine iron (copper, manganese, zinc) chelation rate gel filtration chromatography Determination of cadmium in feedstuffs

GB/T 14699.1 feed sampling HG2934-2000 feed grade zinc sulfate

3 Requirements

3.1 Appearance and traits Methionine zinc (chelate) complexes with a molar ratio of 2. 1 are white or almost white powder, very slightly soluble in water, light in weight and slightly methionine-specific taste. No caking, moldy phenomenon. The methionine zinc complex (chelate) with a molar ratio of 1. 1 is white or almost white powder, soluble in water, slightly methionine-specific odor. no Caking, moldy phenomenon.

3.2 Specifications Feed additive methionine zinc (chelate) products should be consistent with the provisions of Table 1. Table 1 technical indicators project index The molar ratio of 2. 1 product is 1.

4.2.1 Reagents and solutions

4.2.1.1 Methanol.

4.2.1.2 Trichloromethane.

4.2.1.3 o-Phenanthroline trichloromethane solution (0.1g/L). Weigh 0.01g o-phenanthroline, dissolved in 100mL of chloroform (4.2.1.2).

4.2.1.4 eosin methanol solution (0.1%). Weigh 0.1g eosin, dissolved in 100mL of methanol (4.2.1.1).

4.2.1.5 Potassium hydroxide methanol solution (0.5mol/L) Weigh 2.805g potassium hydroxide, dissolved in 100mL of methanol (4.2.1.1).

4.2.2 Identification Weigh 1.0g sample, extracted with 25mL of methanol (4.2.1.1), filtered, the filtrate was taken 0.1mL, respectively, by adding phenanthroline trichloride Methane solution (4.2.1.3) 2mL, eosin methanol solution (4.2.1.4) 3 drops of methanol solution of potassium hydroxide (4.2.1.5) 1mL, shall not appear turbid.

4.4.2 Reagents and materials

4.4.2.1 Potassium iodide.

4.4.2.2 hydrochloric acid solution .6mol/L.

4.4.2.3 Sodium hydroxide solution .20%.

4.4.2.4 sulfuric acid solution. Sulfuric acid water = 15.

4.4.2.5 potassium dihydrogen phosphate solution .200 g/L.

4.4.2.6 dipotassium hydrogen phosphate solution .200 g/L.

4.4.2.7 iodine solution .c (1/2I₂) = 0.1mol/L.

4.4.2.8 sodium thiosulfate standard titration solution $c(\text{Na}_2\text{S}_2\text{O}_3) = 0.1\text{mol/L}$.

4.4.2.9 Starch indicator solution $.10\text{g/L}$.

4.4.3 Analysis steps Weigh 1.5g sample, weighed to 0.0001g, placed in 100mL beaker, add 50mL water, 3mL hydrochloric acid solution (4.4.2.2), plus Heat dissolved, with sodium hydroxide solution (4.4.2.3) to adjust the pH greater than or equal to 13, boiled 3min, cooled and moved into 250mL volumetric flask, Dilute to the mark, take the supernatant filtration, accurately remove 50mL filtrate in iodine bottle, add 50mL of water, with sulfuric acid solution (4.4.2.4) tune A pH of 7 was added and 10 mL potassium dihydrogen phosphate solution (4.4.2.5), 10 mL dipotassium hydrogen phosphate solution (4.4.2.6), 2 g potassium iodide (4.4.2.1), Shake, accurately add 50mL iodine solution (4.4.2.7), evenly, in the dark place 30min, with sodium thiosulfate standard titration solution (4.4.2.8) drops Set until the solution color changes from dark blue to light blue, add 3 mL of starch indicator solution (4.4.2.9) and continue titration until the solution blue disappears. At the same time, take another 100mL beaker and 250mL Erlenmeyer flask, a blank test, in addition to without the sample, the other operations and add the reagent species Class and quantity are the same with the test.

4.4.4 Calculation and representation of results Methionine content in the sample X_1 mass fraction, the value is expressed in%, according to equation (1) calculation. $X_1 = (V_0 - V_1) \times c_1 \times M_1 \times 10^{-3} \times 5 \text{ m}_1 \times 100$ (1) In the formula. V_0

--- titration blank solution consumed sodium thiosulfate standard titration solution (4.4.2.8) volume, in milliliters (mL); Volume of titration solution of sodium thiosulfate standard titration solution (4.4.2.8) consumed by titration sample solution in milliliters (mL); c_1

--- sodium thiosulfate standard titration solution (4.4.2.8) the actual concentration in units of moles per liter (mol/L); M_1

--- and consume 1mol sodium thiosulfate standard titration solution (4.4.2.8) equivalent methionine content, in grams per mole (g/mol) ($M_1 = 74.6$); m_1

5.2 Determination. Determination of methionine content 4.4

4.4.1 Principle Excess iodine solution is added accurately in neutral medium, two iodine atoms are added to the sulfur atom of methionine, the excess iodine solution is treated with sulfur Substitution of sodium sulfate standard titration solution back to the sample from the consumption of sodium thiosulfate standard titration solution volume calculated methionine content of the sample.

6 Label, package, transport and storage

6.1 Label According to GB 10648 implementation.

6.2 Packaging Packaging materials should be non-toxic, harmless, moisture-proof.