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NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

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GB/T 7297-2006

Replacing GB 7297-1987

Food additive - Vitamin B₂ (riboflavin)

饲料添加剂 维生素 B₂ (核黄素)

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Food additive - Vitamin B₂ (riboflavin)

1 Scope

This standard specifies the technical requirements, test methods, inspection rules, labeling, packaging, transportation, storage of feed additive vitamin B₂ (riboflavin) products.

This standard applies to vitamin B₂, which is produced by biological fermentation or chemical synthesis, used as vitamin feed additives in the feed industry.

Molecular formula: C₁₇H₂₀N₄O₆

Relative molecular mass: 376.37 (international relative atomic mass in 1999)

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 6435 Determination of moisture and other volatile mater content in feeds

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

GB 10648 Feed label

GB/T 13080 Determination of lead in feeds - Method using atomic absorption spectrometry

GB/T 14699.1 Feeding Stuffs - Sampling

Pharmacopoeia of the People's Republic of China (2005 edition)

3 Requirements

3.1 Specifications

96%, 98%.

4.1.9 Sulfuric acid.

4.2 Instruments and equipment

4.2.1 Common laboratory equipment.

4.2.2 UV spectrophotometer, which is equipped with a 1 cm cuvette.

4.2.3 Polarimeter.

4.2.4 Atomic absorption spectrophotometer.

4.3 Identification test

4.3.1 Weigh about 1 mg of the sample. Add 100 mL of water to dissolve it. The solution will appear yellow-green and have strong yellow-green fluorescence, under transmitted light. Divide it into 2 parts. Add inorganic acid or alkali solution to 1 part; the fluorescence will be disappeared. Add a little sodium dithionite crystal to the other part. After shaking well, the yellow color disappears and the fluorescence disappears.

4.3.2 Determine the prepared solution according to the content. Use a spectrophotometer to make determination. Use a 1 cm cuvette, to measure the absorption spectrum of the specimen solution, within the wavelength range of 200 nm to 500 nm. It shall have maximum absorption, at the wavelength of $267\text{ nm} \pm 1\text{ nm}$, $375\text{ nm} \pm 1\text{ nm}$, $444\text{ nm} \pm 1\text{ nm}$.

The ratio -- of the absorbance at 375 nm to the absorbance at 267 nm -- shall be $0.31 \sim 0.33$. The ratio -- of the absorbance at 444 nm to the absorbance at 267 nm -- shall be $0.36 \sim 0.39$.

4.4 Determination of vitamin B₂ content

4.4.1 Principle

After the vitamin B₂ in the specimen is dissolved by alkali, its concentration in the test solution is directly proportional to the ultraviolet absorption value at 444 nm wavelength; its percentage content is determined accordingly.

4.4.2 Analytical procedures

Note: Operate in dark!

Weigh about 0.065 g of the specimen (accurate to 0.0002 g). Put it in a 500 mL brown volumetric flask. Add 5 mL of water, to make the sample completely wet. Add 5 mL of sodium hydroxide solution (4.1.2), to dissolve it completely. Immediately add 100 mL of water and 2.5 mL of glacial acetic acid (4.1.4). Add water to dilute it to the mark. Shake well. Accurately pipette 10 mL of test solution, into a 100 mL brown volumetric flask. Add 1.8 mL of sodium acetate solution (4.1.5). Use water to dilute it to the mark.

Weigh 1 g ~ 2 g of the sample (accurate to 0.01 g). Place it in a porcelain crucible, that has been burned at 700 °C ~ 800 °C to a constant weight. Heat slowly over a low fire, until it is completely carbonized. Let it cool. Add 0.5 mL ~ 1 mL of sulfuric acid (4.1.9) to make it moist. Heat at low temperature, until the sulfuric acid vapor is completely removed. Transfer it to a muffle furnace. Burn it at 700 °C ~ 800 °C, until it reaches a constant volume.

4.8.2 Calculations and presentation of results

Residue on ignition X_2 (expressed in mass fraction, value in %) is calculated according to formula (2):

$$X_2 = \frac{m_1 - m_2}{m} \times 100 \quad \dots\dots\dots (2)$$

Where:

m_1 - The mass of the crucible plus residue, in grams (g);

m_2 - The crucible mass, in grams (g);

m - The sample mass, in grams (g).

4.8.3 Repeatability

Results retain two significant figures.

The relative deviation of the results of two simultaneous parallel determinations of the same sample, by the same analyst, shall not be greater than 5%.

4.9 Determination of lead

It is measured according to GB/T 13080.

4.10 Determination of arsenic

Accurately weigh 1 g of the specimen (accurate to 0.0002 g). Make measurement, according to the first method for the determination of arsenic in the Pharmacopoeia of the People's Republic of China (2005 edition) (Gule's method).

5 Inspection rules

5.1 The manufacturer shall ensure that all products meet the requirements specified in this standard. Each batch of products shall be accompanied by a product certificate.

Items stipulated in this standard are exit-factory inspection items, except arsenic and lead.

5.2 Type inspection: In one of the following situations, the quality of feed additive vitamin B₂ shall be type inspected. The inspection items include all items specified in this standard:

- a) After formal production, when raw materials and processes are changed;
- b) After formal production, a type inspection shall be carried out every six months;
- c) When production is stopped and then resumed, type inspection shall be carried out;
- d) When the product quality supervision department makes a request for type inspection.

5.3 The user organization has the right to inspect and accept the received vitamin B₂ products, in accordance with the provisions of this standard. The acceptance time is within one month of the arrival of the goods.

5.4 Sampling method: It is carried out, according to the provisions of GB/T 14699.1. Clean, dry, airtight, light-proof sample bottles shall be prepared for sampling. The bottles shall be labeled with the manufacturer, product name, batch number, sampling date. When sampling, use a clean and applicable sampling tool, to insert three-quarters of the depth of the material layer. Fully mix the sample taken. Divide it into quarters. Each batch of samples is divided into two parts. The amount of each part of sample shall be 3 times the required specimen amount for inspection. Contain it into sample bottles: one bottle is used for inspection; the other bottle is sealed for future reference.

5.5 Judgment rules: If one indicator of the inspection result does not meet the requirements of this standard, it shall double the samples for re-inspection. If only one indicator of the re-inspection result does not meet the requirements of this standard, the entire batch of products will be judged as unqualified.

5.6 Arbitration: If both the supplier and the buyer have objections to the product quality, the arbitration unit can be selected, through negotiation between the two parties, to carry out the arbitration inspection, according to the inspection rules and inspection methods of this standard.

6 Labeling, packaging, transportation, storage

6.1 Label

The label is implemented according to GB 10648.

6.2 Packaging

This product is packaged in a light-proof, airtight, moisture-proof manner (or according

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