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

GB 14758-2010

Replacing GB 14758-1993

National food safety standards -- Food additives -- Caffeine

食品添加剂 咖啡因

(English Translation)

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3.1 Chemical Name

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Foreword

This standard replaces GB 14758-1993 "food additive caffeine." this standard compared with GB 14758-1993, the main changes are as follows.

- Described by the appearance of white crystalline powder to white or very light yellow green crystalline powder;
- Caffeine content allowed by the relative difference between the differential absolute difference of 0.3% to 0.2%;
- Added Infrared Spectroscopy;
- Increase the clarity of the project;
- 0.0003% of arsenic from the index changed to 2 mg/kg;
- Added chromatographic purity requirements.

The Standard Annexes A and B are normative appendix Appendix C is informative appendix.

This standard replaces the standards previously issued as follows.

- GB 14758-1993

National Food Safety Standard Food Additives Caffeine

1 Scope

This standard applies to acetic acid or cyanide as raw materials chemical synthesis and extraction method of tea as raw materials obtained food additive coffee because.

2 Normative references

The standard file referenced in the application of this standard is essential. For dated references, only the edition date of the note Apply to this standard. For undated references, the latest edition (including any amendments) applies to this standard.

3.1 Chemical Name

1,3,7-trimethyl-xanthine Formula 3.2 or $C_8H_{10}N_4O_2 \cdot H_2O$

3.4 Relative molecular mass

Caffeine Anhydrous. 194.19 (according to 2007 international relative atomic mass) A
water-caffeine. 212.21 (according to 2007 international relative atomic mass)

4 Technical Requirements

4.1

Sensory requirements. comply with Table 1.

Table 1 Sensory requirements

Project requires test methods Color white or green belt extremely popular and mercerized take appropriate sample is placed in a clean, dry beaker, under natural light, observe the color and texture, smell the odor. After gargling with warm water and enjoy the taste. Taste, smell bitter, odorless Organization Status needle crystal or crystalline powder or granules. Having weathering

4.2

Physical indicators. to comply with Table 2.

CH3

CH3

CH3

Table 2. Physical and chemical indicators

Item Index Test Method Caffeine ($C_8H_{10}N_4O_2$, dry basis), w /% 98.5 ~ 101.0 Appendix A
A.4 Loss on drying, w /% ≤ 0.5 (Anhydrous) Appendix A A.5 8.5 (aqueous) Residue on
ignition, w /% ≤ 0.1 A.6 in Appendix A no other alkaloids precipitate A.7 in Appendix A
Chromatographic purity, w /% Single impurity ≤ 0.1 Appendix A A.8 Total impurities ≤ 0.1
Arsenic (As)/(mg/kg) ≤ 2 Appendix A A.9 Melting point/ $^{\circ}C$ 235.0 ~ 237.5 Appendix A A.10
Clarity test (20g/L solution) through a test A.11 in Appendix A Heavy metals (Pb)/(mg/kg)
 ≤ 10 Appendix A A.12 Easy carbide by test A.13 in Appendix A Appendix A (Normative)

Testing method A.1 Safety Tips Reagents The standard test methods used for toxic or corrosive, according to the relevant provisions of the operation, should be used with caution. If splash on the skin should immediately wash with water, severe cases should be treated immediately. When using a volatile acid, to be carried out in a fume hood.

A.2 General Provisions the reagents used in this standard unless otherwise stated in the analysis using only recognized as analytical reagents and GB/T 6682-2008 specified in Three water.

The test method used in the standard titration solution, impurities measured by standard solution, preparations and products, not specified in other requirements, according GB/T 601, GB/T 602, the provisions of the preparation of GB/T 603's.

A.3 Identification Test A.3.1 Reagents and materials A.3.1.1 hydrochloric acid.

A.3.1.2 potassium chlorate.

A.3.1.3 ammonia solution. 10 → 100.

A.3.1.4 hydrochloric acid solution. 10 → 100.

A.3.1.5 sodium hydroxide solution. 40g/L.

A.3.1.6 iodine solution. 0.1 mol/L.

A.3.2 Analysis step

A.3.2.1 purple urea acid coloring test Laboratory samples taken from about 10.0 mg, add 1mL hydrochloric acid solution and 0.1 g of potassium chlorate, on a water bath evaporated, the residue in case of ammonia that is significant purple, Plus the number of sodium hydroxide solution was dropped, purple disappeared.

A.3.2.2 caffeine precipitation reaction with iodine and hydrochloric acid test solution Take 5 mL of saturated aqueous laboratory sample, add 5 drops of iodine solution, no precipitation occurs; plus 3 drops of hydrochloric acid solution, which appears red-brown the precipitate can be dissolved in a slight excess of sodium hydroxide solution.

A.3.2.3 Infrared Spectroscopy Using potassium bromide tablet method according to GB/T 6040 test, IR should control profile laboratory sample (see Appendix B) Consistent.

A.4 Determination of caffeine A.4.1 Reagents and materials A.4.1.1 acetic anhydride.

A.4.1.2 benzene.

A.4.1.3 perchloric acid standard titration solution. $c(\text{HClO}_4) = 0.1 \text{ mol/L}$.

A.4.2 Instruments and Equipment Titrator.

A.4.3 Analysis step

Take about 0.4 g laboratory samples, accurate to 0.000 2 g, add 40 mL of acetic anhydride,

dissolved by heating, cooling, add 80 mL of benzene, with a high Standard acid droplets given titration, potentiometric method indicates the end, the results and titration with blank test correction.

A.4.4 Calculation Results Caffeine ($C_8H_{10}N_4O_2$ to count) mass fraction w_1 , expressed in%, according to formula (A.1) Calculated.

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$VV \propto M_w$

Where.

V -- laboratory sample consumption volume of perchloric acid standard solution, in milliliters (mL);

V_0 -- blank test consumption volume perchloric acid standard solution, in milliliters (mL);

Molar concentration c -- perchloric acid titration solution, expressed in moles per liter (mol/L);

Numerical quality m -- laboratory sample in grams (g);

Loss on drying of the value w_2 --,%;

M - molar mass values of caffeine in units of grams per mole (g/mol) [$M(C_8H_{10}N_4O_2) = 194.2$] Take the arithmetic mean of the parallel determination results of the measurement results, the absolute difference between two parallel determination of not more than 0.2%.

A.5 Determination of loss on drying A.5.1 Analysis step Take 1.0 g laboratory samples, accurate to 0.000 2 g, was placed at 80 °C dried to constant weight weighing bottle, precisely weighed, placed in 80 °C Oven dried to constant weight.

A.5.2 Calculation Results Loss on drying sample mass fraction to $2w$ and its value is expressed in%, according to formula (A.2) Calculated.

100m m_w

Where.

Numerical m_1 -- laboratory samples before drying and weighing bottles total mass in grams (g);

After drying m_2 -- numerical laboratory samples weighing bottle and the total mass in grams (g);

Numerical m_3 -- weighing bottle mass in grams (g).

Take the arithmetic mean of the parallel determination results of the measurement results, the results of two parallel determination of the absolute difference is not more than 0.05%.