

THIS REPORT CONTAINS ASSESSMENTS OF COMMODITY AND TRADE ISSUES MADE BY
USDA STAFF AND NOT NECESSARILY STATEMENTS OF OFFICIAL U.S. GOVERNMENT
POLICY

Voluntary Public

Date: 5/31/2011

GAIN Report Number:

China - Peoples Republic of

Post: Beijing

Food Additive Sodium Copper Chlorophyllin

Report Categories:

FAIRS Subject Report

Approved By:

Scott Sindelar

Prepared By:

Melinda Meador and Wu Bugang

Report Highlights:

On May 2, China's Ministry of Health notified to the WTO the National Food Safety Standard on Food Additive Sodium Copper Chlorophyllin as G/SPS/N/CHN/358. The standard applies to powdered food additive sodium copper chlorophyllin obtained by adding copper to the product obtained by the saponification of a solvent extraction of mulberry leaf or dung of silk worms. It specifies the technical requirements and testing methods for sodium copper chlorophyllin. The adoption date of the standard is May 15, 2011. This report contains an INFORMAL translation of the document.

General Information:

BEGIN TRANSLATION

National food safety standard**Food Additive Sodium Copper Chlorophyllin****GB26406-2011****Issued on March 15, 2011****Implemented on May 15, 2011****Issued by the Ministry of Health****National Food Safety Standard****Food Additive****Sodium Copper Chlorophyllin****1. Scope**

This Standard is applicable for sodium copper chlorophyllin, a kind of powdery food additive using mulberry leaves and silkworm excrement as raw materials and produced through procedures including saponification and copper metabolism.

2. Molecular Formula and Relative Molecular Mass**2.1 Molecular Formula** $C_{34}H_{31}O_6N_4CuNa_3$ $C_{34}H_{30}O_5N_4CuNa_2$ **2.2 Relative Molecular Mass** $C_{34}H_{31}O_6N_4CuNa_3$: 724.17 (as per 2007 International Relative Molecular Mass) $C_{34}H_{30}O_5N_4CuNa_2$: 684.16 (as per 2007 International Relative Molecular Mass)**3. Technical Requirements**

3.1 Sensory requirements shall conform to the regulations in Table 1.

Table 1 Sensory Requirements

Item	Requirements	Testing Method
Color	Jasper to dark	Put an appropriate amount of samples on a clean and dry white porcelain plate and observe the color and status of samples in natural light.
Status	Powder	

3.2 Physicochemical indicators shall conform to the regulations in Table 2.

Table 2 Physicochemical Indicators

Item	Indicators	Testing Method
pH	9.5~11.0	A.3, Appendix A
Absorbance [$E^{1\%}$ (405nm \pm 3nm)] \geq	568	A.4, Appendix A
Absorbance Ratio	3.2~4.0	A.4, Appendix A
Total Copper (Cu), w/% \leq	8.0	A.5, Appendix A
Free Copper (Cu), w/% \leq	0.025	A.6, Appendix A
Loss on Drying, w/% \leq	5.0	GB 5009.3 Direct Drying Method ^a
Total Arsenic (Calculated as As)/(mg/kg) \leq	2	GB/T 5009.11
Lead (Pb)/(mg/kg) \leq	5	GB 5009.12
^a Drying temperature and time refer to 105°C and 2h respectively.		

Appendix A

Testing Method

A.1 General Regulations

Unless otherwise specified, any reagents and water involved in this Standard shall refer to analytical reagent and grade-III water as specified in GB/T 6682—2008. Unless otherwise specified, any standard volumetric solution, standard solution for impurity content test, preparation, and final products used for the test shall be prepared in accordance with the regulations under GB/T 601, GB/T 602 and GB/T 603. Any solution used for the test that the testers do not know which solvent will be used to prepare, shall refer to aqueous solution.

A.2 Identification Test

A.2.1 Physical Properties

Soluble in water, hardly soluble in low-alcohol, and not soluble in chloroform. Aqueous solution is transparent and without sedimentation. Under acidic conditions (below pH 6.5), or in case of calcium ions, sedimentation separates out.

A.2.2 Determination of Absorption Peak

Take the sample solution prepared in A4.3.1 absorbance determination. Sample solution has maximum absorption peaks in both 405nm \pm 3nm and 630nm \pm 3nm wavelength ranges.

A.2.3 Copper Sodium Ion Test

Take 1g sample and put in a crucible which is burnt under $800^{\circ}\text{C}\pm 25^{\circ}\text{C}$ to have a constant weight. Slowly heat the samples till they are totally carbonized. Cool the carbonized samples. Moisten the residue with 0.5 mL~1mL sulfuric acid. Continue to heat till sulfuric acid steam goes away. Burn the residue in a high-temperature furnace under $800^{\circ}\text{C}\pm 25^{\circ}\text{C}$ till it has a constant weight. Add 10mL hydrochloric acid solution (1+3) to the residue and heat it in water bath till it dissolves. After filtration, add water to 10mL and consider this as sample solution for the following test:

- Conduct a flame color test on sample solution. Flame is green at first, and then turns yellow.
- Take 5mL sample solution, and then add 0.5mL 0.1% sodium diethyldithiocarbamate solution (1g dissolved in 1000 mL water) to sample solution to produce maroon sedimentation.

A.3 pH Determination

Prepare 1% sample solution (1g samples dissolved in 100mL water), and determine its pH value with acidimeter.

A.4 Determination of Absorbance and Absorbance Ratio

A.4.1 Reagents and Materials

A.4.1.1 0.15mol/L Disodium Hydrogen Phosphate Solution: Take 53.7g disodium hydrogen phosphate ($\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$), dissolve with water, and dilute to 1000mL.

A.4.1.2 0.15mol/L Potassium Dihydrogen Phosphate Solution: Take 20.4g potassium dihydrogen phosphate (KH_2PO_4), dissolve with water, and dilute to 1000mL.

A.4.1.3 Phosphate Buffer Solution (pH7.5): Take 21 0.15mol/L disodium hydrogen phosphate solutions and 4 0.15mol/L potassium dihydrogen phosphate solutions to mix up.

A.4.2 Instruments and Equipment

Spectrophotometer.

A.4.3 Analytical Procedure

A.4.3.1 Preparation of Sample Solution

Accurately take 0.1g samples, accurate to 0.0002g. Dissolve with water, transfer to a 100mL measuring flask to a certain scale, and shake. Take 1mL of the aforesaid aqueous solution, and dilute with phosphate buffer solution (pH7.5) to 100mL, which will be considered as sample solution.

A.4.3.2 Determination

Put sample solution in a 1cm cuvette, and use phosphate buffer solution (pH7.5) for blank control. Determine the absorbance at the longest absorption wavelength within $405\text{nm}\pm 3\text{nm}$ and $630\text{nm}\pm 3\text{nm}$ wavelength ranges with spectrophotometer (absorbance shall be within 0.3~0.7, otherwise sample solution concentration shall be adjusted, and absorbance shall be re-determined).

A.4.4 Result Calculation

A.4.4.1 Sample solution concentration is 1%. The absorbance determined with 1cm cuvette at the maximum absorption wavelength within $405\text{nm}\pm 3\text{nm}$ wavelength range is expressed as $E_{1\text{cm}}^{1\%}(405\text{nm}\pm 3\text{nm})$, and calculated with Formula (A.1):

$$E_{1\text{cm}}^{1\%}(405\text{nm}\pm 3\text{nm}) = \frac{A_1}{c_1} \times \frac{1}{100} \dots\dots\dots (\text{A.1})$$

Where,

A_1 ——Absorbance of sample solution actually measured;

c_1 ——Numerical value of concentration of sample solution tested (converted to the concentration based on dry basis according to loss on drying value of the sample actually measured), g/mL.

A.4.4.2 Absorbance ratio is expressed as w_1 , and calculated with Formula (A.2):

$$w_1 = \frac{E_{1\text{cm}}^{1\%}(405\text{nm}\pm 3\text{nm})}{E_{1\text{cm}}^{1\%}(630\text{nm}\pm 3\text{nm})} \dots\dots\dots (\text{A.2})$$

Where,

$E_{1\text{cm}}^{1\%}(405\text{nm}\pm 3\text{nm})$ ——Sample solution concentration is 1%. The absorbance determined with 1cm cuvette at the maximum absorption wavelength within $405\text{nm}\pm 3\text{nm}$ wavelength range;

$E_{1\text{cm}}^{1\%}(630\text{nm}\pm 3\text{nm})$ ——Sample solution concentration is 1%. The absorbance determined with 1cm cuvette at the maximum absorption wavelength within $630\text{nm}\pm 3\text{nm}$ wavelength range, and determination method is the same as that of $E_{1\text{cm}}^{1\%}(405\text{nm}\pm 3\text{nm})$.

A.4.4.3 The testing result is subject to arithmetic mean of parallel determination results. Absolute difference between two

independent determination results obtained under repeatability conditions shall not be more than 2% of arithmetic mean.

A.5 Total Copper Content

A.5.1 Sample Handling

Accurately take 0.1g samples, accurate to 0.0002g. Put them in a silicon dishware and burn to carbon free at a temperature no higher than 500°C. Moisten with 1 or 2 drops of sulfuric acid, and incinerate again. Boil with 10% hydrochloric acid solution three times (5mL each time) to dissolve ash content. Filter in a 100mL measuring flask. Dilute with water to a certain scale after it cools, which will be considered as sample solution.

A.5.2 Determination

Except for sample handling, other procedures shall conform to those under GB/T 5009.13.

A.6 Free Copper Content

A.6.1 Sample Handling

Accurately take 0.1g samples, and dissolve with 50mL water. Adjust pH value to 4.0 with 1mol/L hydrochloric acid. Dilute to 100mL, and then filter, which will then be considered as sample solution.

A.6.2 Determination

Except for sample handling, other procedures shall conform to those under GB/T 5009.13.

END TRANSLATION