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

GB 8817-2001

**Food additive Caramel (Sulfite ammonia caramel, ammonia
caramel, plain caramel)
(English Translation)**

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1 Scope

This standard specifies the technical requirements, test methods, inspection rules, packaging, marking, storage, transportation requirements for liquid and powdered caramel made by ammonium sulfite method, ammonia method, plain method.

This standard applies to liquid and powdered caramel made by ammonium sulfite method, ammonia method, plain method, using sucrose, starch syrup, xylose mother liquor, etc. as raw materials. It is used as colorants in food.

2 Normative references

The provisions contained in the following standards constitute the provisions of this standard through reference in this standard. When this standard was published, the versions shown were all valid. All standards are subject to revision. Parties using this standard should explore the possibility of using the latest version of the following standards.

GB/T 602-1988 Chemical reagent - Preparations of stock standard solutions

GB/T 5009.5-1985 Method for determination of protein in foods

GB/T 5009.17-1996 Method for determination of total mercury in foods

GB/T 5009.34-1996 Method for determination of sulfite in foods

GB/T 8449-1987 Method for determination of lead in food additives

GB/T 8450-1987 Method for determination of arsenic in food additives

GB/T 8451-1987 Method for limit test of heavy metals in food additives

3.1 Sensory indicators

3.1.1

Color and appearance

Dark brown, thick liquid or powdery.

4.2 Determination of absorbance

Weigh 0.5 g of sample (accurate to 0.002 g). Use water to make the volume reach to the mark in a 500 mL volumetric flask; use a 1 cm cuvette to measure its absorbance at 610 nm with a spectrophotometer.

4.3.1 Determination method

Weigh 2 g of sample (accurate to 0.0002 g) in a weighing bottle that has been weighed constant. Dry at 105 °C for 2 h. Cool it. Weigh it.

4.3.2 Expression of analysis results

Where:

X1 - Loss on drying, %;

m1 - Mass of weighing bottle and sample before drying, g;

m2 - Mass of weighing bottle and sample after drying, g;

m - Mass of sample, g.

4.4.1 Reagents and solutions

4.4.1.1

Boric acid (GB/T 628)

2% solution.

4.4.1.2 Methyl red-bromocresol green mixed indicator solution: Mix 5 parts of 0.2%

bromocresol green ethanol solution and 1 part of 0.2% methyl red ethanol solution.

4.4.1.3 Magnesium oxide (HGB 1294).

4.4.1.4 Hydrochloric acid (GB/T 622): 0.1 mol/L solution, which is prepared and calibrated according to GB/T 602.

4.4.2 Determination method

Weigh 5g of sample (accurate to 0.01 g). Place it in a 500 mL distillation flask. Add 2 g of magnesium oxide and 200 mL of water. Distill by direct fire. The distillate is absorbed in 5 mL of 2% boric acid solution with 5 drops of mixed indicator solution.

When the distillate reaches about 100 mL, stop distillation and titrate the distillate with 0.1 mol/L hydrochloric acid, until it turns gray-red.

A and B are mixed in equal amounts before use.

4.6.1.9 4-Methylimidazole standard solution

Weigh the sample 4-methylimidazole (accurate to 0.1000 g). Place it in a 100 mL volumetric flask. Add 95% ethanol to the mark. Each 1 mL of this solution is equivalent to 1.0 mg of 4-methylimidazole.

Before use, use 95% ethanol to dilute it, to the level that each 1 mL is equivalent to 0.1 mg of 4-methylimidazole standard solution.

4.6.2.1 Extraction

Weigh 5 g of sample (accurate to 0.01 g). Add 15 mL of water to dissolve. Add 15 mL of 10% sodium carbonate. Add 80 mL of chloroform-anhydrous ethanol mixed solution to a 250 mL separatory funnel. Shake vigorously for 4 min ~ 5 min. After complete layering, collect the chloroform-anhydrous ethanol extract in a 250 mL stoppered conical flask. Use 70 mL of chloroform-anhydrous ethanol mixed solution to extract the above water layer once. Combine the extracts. Add 20 mL of 0.05 mol/L sulfuric acid to the extract. Shake vigorously 60 times. Separate the water layer. Concentrate this solution to 2 mL ~ 3 mL in a 60 °C ~ 70 °C water bath. Slowly add about 0.2 g of sodium bicarbonate fine powder, until no bubbles are generated. Use ethanol to dissolve it to 5 mL.

4.6.2.2 Plate preparation

Weigh 3 g of silica gel (GF 254). Add 1 mL of 80% sodium bicarbonate solution and 6 mL of distilled water. Mix well and apply on a 125 mmx85 mm thin plate. Dry naturally in the air. Put it in an oven at 120 °C for 2 minutes. After taking it out, put it in a dryer for use.

4.6.2.3 Spotting

Spot 10 µL, 20 µL, 30 µL of 4-methylimidazole standard solution and 100 µL of sample diluent on the thin plate, respectively.

Develop the thin plate in the developing agent until the solvent front reaches 10 cm.

Take out the thin plate. Blow dry it. Spray it with a newly prepared color developer.

Within 5 min ~ 10 min, the yellow spot of 4-methylimidazole can reach the deepest depth and remain stable for several hours. According to the size and color depth of the spot compared with the standard spot, determine the content of 4-methylimidazole in the sample.

4.6.3 Expression of analysis results

Where:

X3 - 4-methylimidazole content, %;

c - Amount of sample spot equivalent to standard spot, μg ;

m - Sample mass, g;

V1 - Spot volume, μL ;

V2 - Total volume of sample solution, μL ;

A610 - Absorbance of sample at 610 nm;

0.1/A610 - Content converted to chromaticity of 0.1.

4.7 Determination of arsenic

It is determined by arsenic spot method after wet digestion in accordance with GB/T 8450-1987.

4.8 Determination of lead

It is determined by wet digestion in accordance with GB/T 8449-1987.

4.9 Determination of heavy metals

It is determined by wet digestion in accordance with GB/T 8451-1987.

4.10 Determination of total nitrogen

It is determined according to GB/T 5009.5.

4.11.1 Reagents and solutions

4.11.1.1

Magnesium oxide (HGB 1294).

4.11.1.2

Magnesium nitrate $[\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}]$ (HG 3-1077).