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

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**Cleaning agent for fruit and vegetable  
(English Translation)**

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## 1 Scope

This standard specifies the technical requirements, test methods, inspection rules, markings, packaging, transportation, storage requirements for cleaning agents for fruit and vegetable.

This standard applies to cleaning agents, that are mainly formulated with surfactants and additives, for the purpose of cleaning fruits and vegetables.

## 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 4789.2 Microbiological examination of food hygiene - Aerobic plate count

GB/T 4789.3 Microbiological examination of food hygiene - Detection of  
Coliform bacteria

GB/T 6368 Surface active agents - Determination of pH of aqueous solution  
- Potentiometric method (GB/T 6368-2008, ISO 4316.1977, IDT)

GB 9985-2000 Detergents for hand dishwashing

GB/T 13173-2008 Surface active agents - Detergents - Testing methods

GB 14930.1 Hygienic standard for detergent for food tools and installations

GB/T 15818 Test method for biodegradability of surfactants

QB/T 2951 Inspecting rules for detergent products

QB/T 2952 Requirements for detergent marks and packaging

JJF1070 Rules of metrological testing for net quantity of products in prepackages with fixed content content shall be carried out, according to the provisions of Chapter 7 (Method B) in GB/T 13173-2008.

#### **4.4 Determination of pH value**

It is carried out in accordance with the provisions of GB/T 6368.

#### **4.5 Determination of methanol content (for liquid products)**

After preparing the standard solution, according to the provisions of Appendix D of GB 9985-2000, carry out the determination.

#### **4.6 Determination of formaldehyde content (for liquid products)**

It is carried out in accordance with the provisions of Appendix E of GB 9985-2000.

#### **4.7 Determination of arsenic content**

It is carried out in accordance with the provisions of Appendix F of GB 9985-2000.

#### **4.8 Determination of heavy metal content**

It is carried out in accordance with the provisions of Appendix G of GB 9985-2000.

#### **4.9 Determination of fluorescent brightener**

It is carried out in accordance with the provisions of Appendix C of GB 9985-2000.

#### **4.10 Microbiological examination**

For the total number of bacteria AND the coliform group, they are respectively examined, in accordance with GB/T 4789.2 and GB/T 4789.3.

#### **4.11 Determination of the biodegradability of surfactants**

For the biodegradability of the surfactant, which is used in the product formulation of the cleaning agent for fruit and vegetable, it shall be carried out in accordance with the provisions of GB/T 15818.

#### **4.12 Determination of net content**

For the inspection, sampling method and determination rules of the net content of the sales package of cleaning agent for fruit and vegetable, they shall be carried out in accordance with the provisions of JJF 1070.

#### **Appendix A (Normative)**

Verification method of cleaning agent for fruit and vegetable on the removal of residual pesticides

#### **A.1 Scope**

This method specifies the preparation methods of pesticide emulsions AND samples containing pesticides on the surface of vegetables; the cleaning methods of samples, which contain pesticides on the surfaces of vegetables;

the determination method of pesticide removal rate.

This method is suitable for the determination of the removal rate of cypermethrin and propoxur pesticides, by a cleaning agent for fruit and vegetable, which is compounded with surfactants and additives.

The detection range of this method is 4.3 µg/mL ~ 430.0 µg/mL for cypermethrin,

1.5 µg/mL ~ 150.0 µg/mL for propoxur.

#### **A.2 Normative references**

GB/T 13174 Determination of detergency and cycle of washing property for laundry detergents.

#### **A.3 Principles of the method**

Prepare vegetable samples with pesticides several times exceeding the limit.

Simulate actual washing conditions. After cleaning with a 0.2% cleaning agent for fruit and vegetable solution, use the extraction and concentration method to obtain the residual pesticides. Use high performance liquid chromatography, to determine the amount of pesticide residues, on the surface of the vegetables before and after cleaning. Calculate the removal rate of residual pesticides.

Compare it with the removal rate of the residual pesticides, after washing by the water of certain hardness. The ratio is the evaluation result of the cleaning effect of the cleaning agent for fruit and vegetable, on the residual pesticides.

#### **A.4 Reagents**

Unless otherwise specified, it only uses the confirmed analytical reagents AND distilled or deionized water or water of equivalent purity, in the analysis (applicable to all appendixes of this standard).

##### **A.4.1 Anhydrous ethanol;**

Weigh 5.00 g of cypermethrin and 2.50 g of propoxur. Dissolve it in 500 g of absolute ethanol solution. After stirring evenly, use 250 mg/kg of hard water to make its mass reach to 5000 g. Mix well. Prepare for use. The concentration of the pesticide emulsion is. 0.1% cypermethrin and 0.05% propoxur.

#### **A.6.3 Preparation of vegetables containing pesticides**

Completely immerse the sweet beans in the pesticide emulsion for 20 minutes.

Take them out. Shake off the residual liquid droplets from the surface. Place them in a cool place, at room temperature, for 24 hours. Divide the prepared vegetable samples into 3 groups. one group is unwashed (the amount of pesticides on the surface of unwashed vegetable samples is preferably 140 mg/kg ~ 200 mg/kg); one group is washed by water; one group is washed by the cleaning agents for fruit and vegetable. Each group contains 2 sets, each set is 80 g. Prepare for use.

##### **A.7.1 Water washing method**

The washing temperature is 30 °C; the hard water is 800 mL (A.4.11).

Washing. Take 800 mL of hard water (A.4.11). Add it to the fruit and vegetable dehydrator. At the same time, add one set of the prepared vegetables (A.6.3).

Soak it for 1 min. Then start washing at a uniform speed, for 4 min. The washing and stirring method are one clockwise round plus one counterclockwise round, at a frequency of about 19 r/min ~ 21 r/min.

Rinsing. Put the washed vegetable samples into the inner cylinder of a clean fruit and vegetable dehydrator. First use 1000 mL of hard water (A.4.11) to rinse it completely. Discard it. Then add 1000 mL of hard water (A.4.11). Use the washing and stirring method, which is same as the above method, to wash it for 30 s (one clockwise round plus one counterclockwise round, at the frequency of about 19 r/min ~ 21 r/min). Discard the second rinsing water. Use the same method to carry out the third rinsing.

Conduct parallel tests, at the same time.