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

GB 7658-2005

**Food additive -- Sorbitol solution
(English Translation)**

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1 Scope

This Standard specifies requirements, test method, inspection rules as well as marks, package, transport and storage of food additive - sorbitol solution.

This Standard is applicable to food additive - sorbitol solution which takes glucose as raw material and is refined by hydrogenation in the presence of catalyst. This product shall be used as humectant and sweetener during food processing.

Molecular formula: C₆ H₁₄ O₆

Structural formula:

Relative molecular mass: 182.17 (according to international relative atomic mass in 2007)

2 Normative references

The following standards contain the provisions which, through reference in this

Standard, constitute the provisions of this Standard. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard. However, the parties who enter into agreement based on this

Standard are encouraged to investigate whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Standard.

GB/T 601 Chemical Reagent - Preparations of Standard Volumetric
Solutions

GB/T 602 Chemical Reagent - Preparations of Standard Solutions for
Impurity (GB/T 602-2002, ISO 6353-1:1982, NEQ)

GB/T 603 Chemical Reagent - Preparations of Reagent Solution for Use in

Test (GB/T 603-2002, ISO 6353-1:1982, NEQ)

Relative density ()

1.285~1.315

Reducing sugar (in glucose) mass fraction / % ≤ 0.21

Total sugar (in glucose) mass fraction / % ≤ 8.0

Arsenic (As) mass fraction / % ≤ 0.0002

Lead (Pb) mass fraction / % ≤ 0.0001

Heavy metal (in Pb) mass fraction / % ≤ 0.0005

Chloride (in Cl) mass fraction / % ≤ 0.001

Sulfate (in SO₄) mass fraction / % ≤ 0.005

Nickel (Ni) mass fraction / % ≤ 0.0002

Residue on ignition mass fraction / % ≤ 0.10

NOTE: Arsenic (As) mass fraction, lead (Pb) mass fraction and heavy metal (in Pb) mass fraction are mandatory.

4.1 Warning

Some test procedures prescribed in test method may lead to dangerous situations. The operator shall take appropriate safety and health measures.

4.2 General provisions

Unless other requirements specified, reagents and water used in this Standard all refer to analytical-pure reagents and Grade 3 water stipulated in GB/T 6682-

2008.

Unless other requirements specified, standard solution, impurity standard solution, preparations and products used for test shall be prepared based on the provisions of GB/T 601, GB/T 602 and GB/T 603.

4.3.1 Reagent

4.3.1.1

Sulfuric acid;

4.3.1.2

Ferrous sulfate solution

80 g/L;

4.3.1.3

Sodium hydroxide solution

200 g/L;

sample solution through chromatographic column. Use refractive index detector to detect. Adopt external standard method to quantify. Calculate sorbitol content in sample.

4.5.2.1 Water, GB/T 6682, Grade 2: filtered by 0.45 µm membrane filter, ultra

pure and degasified;

4.5.2.2 Sorbitol standard sample: sorbitol mass fraction $\geq 98\%$;

4.5.3.1 High performance liquid chromatography (HPLC)

4.5.3.1.1

High-pressure pump

No pulse, it can maintain flow rate between 0.1 mL/min ~ 10.0 mL/min;

4.5.3.1.2

Dosing ring

20 µL;

4.5.3.1.3

Chromatographic column

See Table 2;

4.5.3.1.4

Refractive index detector

500x10

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* RIU or refractive index detector with corresponding sensitivity

4.5.3.1.5

Data processing system

Analysis software with Millennium 32, or chromatography workstation with corresponding functions, or chromatography data processor.

4.5.3.2 Suction filtration system

Suction filtration system uses cellulose ester membrane filter of which aperture is 0.45 μm (used for preprocessing of mobile phase water).

4.5.3.3 Filtration system

Filtration system uses cellulose ester membrane filter of which aperture is 0.45 μm (used for preprocessing of sample).

4.5.3.4 Micro syringe

Special for HPLC, 100 μL .

4.5.4 Chromatography conditions

Recommended chromatography conditions are shown in Table 2. Typical HPLC

4.8.1 Method summary

Heat at a certain temperature, time and concentration. Reducing sugar in sample shall be oxidized by an excess of Fehling solution, react and produce cuprous oxide precipitate. Sulfate is reduced to ferrous sulfate by cuprous oxide.

Use potassium permanganate standard solution to generate ferrous sulfate.

Based on the consumption of potassium permanganate standard solution, check Potassium permanganate cuprous oxide - glucose conversion table, and glucose mass shall be obtained. By calculation, reducing sugar (in glucose) content shall be calculated.

4.8.2 Reagent

4.8.2.1

Fehling solution;

4.8.2.2

Ferric sulfate solution

50 g/L. Weigh 50 g of ferric sulfate. Add 200 mL of water to dissolve. Gradually add 100 mL of sulfuric acid. After mixing and cooling, add water to dilute to 1000 mL;

4.8.2.3

Potassium permanganate standard solution

$C(1/5 \text{ KMnO}_4) = 0.1 \text{ mol/L}$.