



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

GB 25585-2010

**National food safety standards of food additive potassium
chloride**

食品安全国家标准 食品添加剂 氯化钾

(English Translation)

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1 Scope

This Standard applies to potassium chloride produced from rock salt carnallite or sea salt with magnesium chloride and potassium chloride as main components, and potassium chloride obtained through refining as a food additive.

2 Normative references

The documents referenced in this Standard are indispensable for the application of this Standard. For dated references, only the dated edition applies to this Standard. For undated references, the latest edition (including all amendments) applies to this Standard.

3.1 Molecular formula

KCl

3.2 Relative molecular mass

74.55 (according to the international relative atomic mass in 2007)

4 Technical requirements

4.1

Sensory requirements

Shall meet the requirements of Table 1.

4.2

Physical and chemical indicators

Shall meet the requirements of Table 2.

Appendix A (Normative)

Test methods

A.1 Warning

Some of the reagents used in the test methods of this Standard are toxic or corrosive, and they must be handled with care! If it is splashed on the skin, use water to rinse it immediately. If it is serious, seek medical attention immediately. When using volatile acids, work in a fume hood.

A.2 General

The reagents and water used in the test methods of this Standard, unless otherwise specified, refer to analytically pure reagents and grade-III water specified in GB 6682-2008. The standard solutions, impurity standard solutions, preparations and products required in the tests of this Standard shall be prepared in accordance with the provisions of HG/T 3696.1, HG/T 3696.2 and HG/T 3696.3 unless other requirements are specified.

A.3 Identification test

A.3.1 Identification of potassium ions

Weigh about 2 g of the sample; place it in a beaker; add about 10 mL of water to dissolve it. Soak the platinum wire of a glass rod (with a platinum wire ring on the top) in hydrochloric acid and burn it on a flame until it becomes colorless; then, dip it in a small amount of test solution and burn it on a flame. It shall show a purple flame under the cobalt glass.

A.3.2 Identification of chloride ions

Take the sample solution (A.3.1) and add silver nitrate solution (10 g/L) to produce a white precipitate which is insoluble in nitric acid.

A.4 Determination of potassium chloride

A.4.1 Method summary

Same as Chapter 2 of GB/T 3050-2000.

A.4.2 Reagents and materials

A.4.2.1 Nitric acid solution: 1+1.

A.4.2.2 Saturated potassium nitrate solution.

A.4.2.3 Bromophenol blue indicator solution: 1 g/L ethanol solution.

A.4.2.4 Silver nitrate standard titration solution: $c(\text{AgNO}_3) \sim 0.1 \text{ mol/L}$.

A.4.3 Instruments and apparatuses

A.4.3.1 Potentiometer: The graduation value is 2 mV and the range is -500 mV ~ +500 mV.

A.4.3.2 Reference electrode: double liquid junction saturated calomel electrode.

A.4.3.3 Measuring electrode: silver electrode.

A.4.4 Analysis steps

Weigh about 0.25 g of the sample dried for 2 h according to A.5, accurate to 0.0001 g;

place it in a 100 mL beaker; add 40 mL of water to dissolve; add 1 drop of bromophenol blue indicator solution; add 1 to 2 drops of nitric acid solution to make the solution just yellow; use a standard silver nitrate titration solution with a concentration of about 0.1 mol/L; follow the steps in 4.6 of GB/T 3050-2000 starting from "Put in an electromagnetic stirrer..."; record the total volume and corresponding potential value after each addition of the standard silver nitrate titration solution; calculate the volume (V) of the standard silver nitrate titration solution consumed by the titration to the endpoint.

A.4.5 Result calculation

The potassium chloride content is calculated based on the mass fraction w_1 of potassium chloride (KCl), and the value is expressed in %, calculated according to Formula (A.1):

Where:

V - the value of the volume of the silver nitrate standard titration solution consumed in the titration, in milliliters (mL);

c - the exact value of the concentration of the silver nitrate standard titration solution, in moles per liter (mol/L);

w_0 - the value of the mass fraction of the loss on drying measured in A.5, expressed in %;

m - the value of the sample mass, in grams (g);

M - the value of the molar mass of potassium chloride (KCl), in grams per mole (g/mol) ($M = 74.55$).

A.6.2 Analysis steps

Weigh about 5 g of the sample and dissolve it in 50 mL of freshly prepared carbon dioxide-free water. After adding 3 drops of phenolphthalein indicator solution, the solution shall not show pink. After adding 0.3 mL of sodium hydroxide standard titration solution, the test solution shall show pink.

A.7 Determination of iodine and bromine

A.7.1 Reagents and materials

A.7.1.1 Trichloromethane.

A.7.1.2 Sodium hypochlorite solution.

A.7.2 Analysis steps

Weigh 2 g of the sample to an accuracy of 0.01 g; place it in a 25 mL colorimetric tube; add 6 mL of water and dissolve. Add 1 mL of trichloromethane; then, dropwise add 5 mL of sodium hypochlorite solution while shaking the colorimetric tube. The trichloromethane layer shall not show any temporary purple or permanent orange color.

A.8 Determination of sodium

A.8.1 Reagents and materials

A.8.1.1 Hydrochloric acid: guaranteed reagent.

A.8.1.2 Stock solution of sodium standard solution: 1 mL of solution contains 0.1 mg of sodium (Na).

Preparation: Use a pipette to transfer 10 mL of the sodium standard solution prepared according to HG/T 3696.2 into a 100 mL volumetric flask; dilute to the mark; shake well.

A.8.1.3 Sodium standard solution: 1 mL of solution contains 0.01 mg of sodium (Na).

Preparation: Use a pipette to transfer 10 mL of sodium standard solution stock solution (A.8.1.2) into a 100 mL volumetric flask; dilute to the mark; shake well.

A.8.1.4 Cesium chloride solution: 20 g/L.

Weigh 2 g of cesium chloride (spectrally pure); place it in a 100 mL beaker; add an appropriate amount of water to dissolve it completely; use water to dilute to 100 mL; shake well. Store in plastic bottles.

A.8.1.5 Acetylene: high purity.

A.8.1.6 Water: Grade-II water in accordance with GB/T 6682-2008.