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

GB 29213-2012

Food additive potassium nitrate

食品添加剂 硝酸钾

(English Translation)

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1 Scope

This standard applies to ammonium nitrate, sodium nitrate and potassium chloride as raw materials, by the decomposition method or ion exchange method and other methods, and then refined Preparation of the food additive potassium nitrate.

2.1 Chemical name

Potassium nitrate

2.2 Molecular formula

KNO₃

2.3 Relative molecular mass

101.1 (according to 2007 International relative atomic mass)

3.1 Sensory requirements

Shall comply with the provisions of Table 1.

Table 1 sensory requirements

The project requires a test method Colorless or white State granular crystals or crystalline powders Take the appropriate amount of sample in a 50mL beaker and look under natural light Color and state

3.2 Physical and chemical indicators

Shall comply with the provisions of Table 2.

Table 2 Physical and chemical indicators

Item Index Test Method Potassium nitrate (KNO₃) content (on dry basis), w /% 99.0 ~ 100.5
Appendix A in A.4 Dry reduction, w /% ≤ 1.0 Appendix A A.5

Table 2 (continued)

Item Index Test Method Chlorate salt through Test Appendix A, A.6 Arsenic (As)/(mg/kg) ≤ 3 GB/T 5009.76 Lead (Pb)/(mg/kg) ≤ 4 GB 5009.12 Appendix A Testing method A.1
Warning Some of the reagents used in the test methods of this standard are toxic or corrosive and should be operated with appropriate safety and protective measures.

A.2 General provisions the reagents and water used in this standard, when not specified in other requirements, refer to the analysis of pure reagents and GB/T 6682-2008 in the provisions of the three Water level. Standard solutions, preparations and articles for the determination of impurities in standard titration solutions and standards for the determination of these standards are not specified in the absence of other requirements Prepared according to GB/T 601, GB/T 602, GB/T 603. The solution used refers to an aqueous solution when it is not specified with any solvent formulation.

A.3 Identification test A.3.1 Reagents and materials A.3.1.1 acetic acid.

A.3.1.2 Ethanol.

A.3.1.3 Sodium tartrate solution. 100 g/L.

A.3.1.4 Ammonia solution. 4 6.

A.3.1.5 potassium permanganate solution. $c(1/5\text{KMnO}_4) = 0.1\text{mol/L}$. 3.161g potassium permanganate was weighed and dissolved in an appropriate amount of water Release to 1000mL.

A.3.2 Identification method A.3.2.1 Identification of potassium ions Weigh 1g sample dissolved in 10mL water, adding sodium tartrate, the formation of white crystal precipitation, in the ammonia sample solution, the basic hydroxide and the carbonate solution can be dissolved. Stirring, rubbing the inside of the tube with a glass rod or adding a small amount of acetic acid or ethanol can accelerate the precipitation generate.

A.3.2.2 Identification of nitrate ions A.3.2.2.1 Weigh 1 g of the sample in 10 mL of water and drop it into the potassium permanganate solution without causing a fading reaction.

A.3.2.2.2 Place the sample on the copper foil, add sulfuric acid, and heat the brown smoke.

A.4 Determination of potassium nitrate (KNO₃) content A.4.1 Reagents and materials

A.4.1.1 Sodium hydroxide solution. 400 g/L.

A.4.1.2 sulfuric acid solution. $c(\text{H}_2\text{SO}_4) = 0.1 \text{ mol/L}$.

A.4.1.3 sodium hydroxide standard titration solution. $c(\text{NaOH}) = 0.1 \text{ mol/L}$.

A.4.1.4 Methyl red-methylene blue mixed indicator solution.

A.4.1.5 Water without ammonia.

A.4.1.6 Nitrogen fixation alloy. particle size not more than 0.85mm.

A.4.2 Instruments and equipment A.4.2.1 Distillation apparatus. A nitrogen fixation apparatus according to Figure A.1 or other equipment with the same distillation capability.

A.4.2.2 zeolite.

- 1 --- distillation bottle;
- 2 --- splash tube;
- 3 --- dropping funnel;
- 4 --- ball-type grinding or rubber plug;
- 5 --- spherical condenser;
- 6 --- absorption bottle.

Figure A.1

A.4.3 Analysis steps Weigh 0.4 g of the sample which had been dried at $105^\circ\text{C} \pm 2^\circ\text{C}$ for 4 h, accurate to 0.0002 g. Add 300 mL of ammonia to the distillation flask Water, shake the sample to dissolve. Add about 3g nitrogen and a few zeolites, the distillation bottle connected to the distillation device, the interface should be coated Grease to prevent leakage. In the absorption bottle with a pipette into the 50mL sulfuric acid solution, add 4 drops to 5 drops of methyl red - methylene blue mixed instructions Liquid and connected to the distillation unit. Add appropriate amount of water to the absorption bottle to ensure that the outlet of the draft tube is about 1.5 cm below the absorbed liquid level. by Distillation unit of the separatory funnel by adding 15mL sodium hydroxide solution, the solution will flow into the 20mL ~ 30mL water rinse funnel, the remaining 3mL ~ 5mL water off the piston. After standing for 10min, turn on the cooling water, while heating, boiling according to the degree of foam adjustment Heat strength, to avoid the bubble overflow or droplets out. After distilling at least 150 mL of distillate, check the droplets with a pH test paper, if not alkaline the distillation is terminated. Flush the lower end of the diversion tube with a small amount of water and remove the absorption bottle. Titration of the suction bottle with titration solution with sodium hydroxide standard titration the liquid is gray-green as the end point.

While the blank test. Blank test in addition to no sample, the other operations and the type and amount of reagents added (standard titration solution and the same).

A.4.4 Calculation of results the mass fraction w_1 of the potassium nitrate (KNO_3) content is calculated according to the formula (A.1) $w_1 = [(V_0 - V_1)/1000] c_M m \times 100\%$ (A.1) where.

V_0 - the volume of sodium hydroxide standard titration solution consumed in the blank test in milliliters (mL);

V_1 --- titration sample solution consumed by the volume of sodium hydroxide standard titration solution in milliliters (mL);

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

M - the molar mass of potassium nitrate (KNO_3) in grams per mole (g/mol) ($M = 101.1$);

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

1000 --- conversion factor.

The experimental results are based on the arithmetic mean of the parallel measurement results, and the absolute difference between the two independent determinations obtained under the repeatability condition the value is not greater than 0.3%.

A.5 Determination of dry reduction A.5.1 Instruments and equipment A.5.1.1 weighing bottle. $\phi 30\text{mm} \times 25\text{mm}$.

A.5.1.2 electric thermostat oven. can control the temperature at $105^\circ\text{C} \pm 2^\circ\text{C}$.

A.5.2 Analysis steps Continue to dry at a temperature of $105^\circ\text{C} \pm 2^\circ\text{C}$ until a constant weighing bottle weighing approximately 2 g of sample, accurate to 0.0002 g at $105^\circ\text{C} \pm 2^\circ\text{C}$ dry 4h, cooling 30min, weighing.

A.5.3 Calculation of results the mass fraction w_2 of the drying reduction is calculated according to the formula (A.2) $w_2 = (m_1 - m_2) m \times 100\%$ (A.2) where.

m_1 --- the mass of the sample and weighing bottle, in grams (g);

m_2 --- the value of the sample after drying and the weight of the weighing bottle, in grams (g);

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

The experimental results are based on the arithmetic mean of the parallel measurement results, and the absolute difference between the two independent determinations obtained under the repeatability condition Value is not greater than 0.2%.

A.6 Determination of chlorate Weigh about 0.1g The sample was dried at $105^\circ\text{C} \pm 2^\circ\text{C}$ for 4 h. In a beaker, 2 mL of sulfuric acid was added and the sample remained white There is odor and gas generated, that is through the test.

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