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Replacing GB/T 18877-2009

Organic inorganic compound fertilizer

有机无机复混肥料

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Organic inorganic compound fertilizer

1 Scope

This Standard specifies the terms and definitions, technical requirements, sampling, test methods, inspection rules, marks and quality certificates, packaging, transportation and storage for organic inorganic compound fertilizer.

This Standard is applicable to the organic inorganic compound fertilizer that is made by organic materials such as human and livestock manure, animal and plant residues, scraps of agricultural products processing, through fermentation and harmless treatment, added with inorganic fertilizer.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 6679, *General rules for sampling solid chemical products*

GB/T 8170, *Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 8569, *Packing of solid chemical fertilizers*

GB/T 8573, *Determination of available phosphorus content for compound fertilizers*

GB/T 8576, *Determination of free water for compound fertilizers - Vacuum oven method*

GB/T 8577, *Determination of free water for compound fertilizers - Karl Fischer method*

GB/T 15063-2020, *Compound fertilizer*

GB/T 17767.1, *Determination of organic-inorganic compound fertilizers - Part 1: Total nitrogen content*

GB/T 17767.3, *Determination of organic-inorganic compound fertilizers - Part 3: Total potassium content*

GB 18382, *Fertilizer marking - Presentation and declaration*

GB/T 19524.1, *Determination of fecal coliforms in fertilizers*

GB/T 19524.2, *Determination of mortality of ascarid egg in fertilizers*

GB/T 22923-2008, *Determination of nitrogen, phosphorus and potassium for fertilizers by auto analyzer*

GB/T 22924, *Determination of biuret content for compound fertilizers (complex fertilizers)*

GB/T 23349, *Determination of arsenic, cadmium, chromium, lead and mercury contents for fertilizers*

GB/T 24890-2010, *Determination of chloride content for compound fertilizers*

GB/T 24891, *Determination of particle size for compound fertilizers*

GB 38400, *Limitation requirements of toxic and harmful substance in fertilizers*

HG/T 2843, *Chemical fertilizer Products-standard volumetric, standard, reagent and indicator solutions for chemical analysis*

NY/T 1117, *Water - Soluble fertilizers - Determination of calcium, magnesium, sulphur and chlorine content*

NY/T 1972, *Water-soluble fertilizers - Determination of sodium, selenium, silicon content*

NY/T 1978, *Fertilizers - Determination of mercury, arsenic, cadmium, lead and chromium content*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 organic inorganic compound fertilizer

A compound fertilizer containing a certain amount of organic fertilizer.

NOTE: Organic inorganic compound fertilizer includes organic inorganic mixed fertilizer.

4 Technical requirements

4.1 Appearance: Granular or strip product, without mechanical impurities.

divider or quarter method. Reduce into two portions. Subpack into two clean, dry glass bottles or plastic bottles with ground stoppers. Seal and label them, indicating manufacturer name, product name, product category, batch number or production date, sampling date and name of the person who took the sample. One bottle is for product inspection. The other is stored for two months, for future inspection.

6 Test methods

WARNING - Potassium dichromate and its solution in the reagent are oxidizing. Sulfuric acid and its solutions, hydrochloric acid, silver nitrate solution and sodium hydroxide solution are corrosive. Related operations shall be carried out in a fume hood. This Standard does not point out all possible safety issues. The user is responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.

6.1 General provisions

The preparation of reagents, water and solutions used in this Standard, when specifications and preparation methods are not specified, shall be in accordance with HG/T 2843. Except for appearance and particle size, two test materials are tested in parallel.

6.2 Specimen preparation

Take a bottle of sample from 5.2. After multiple reductions, take out about 100g. Grind quickly to pass the 0.50mm or 1.00mm aperture test sieve (if the sample is wet or difficult to crush, it can be ground to pass the 2.00mm aperture test sieve). Mix well. Collect in a drying bottle for determination of content. The remaining samples are used to determine the appearance, particle size, mortality of roundworm eggs, and the number of fecal coliforms.

6.3 Appearance

Use visual inspection method.

6.4 Organic matter content

6.4.1 Principle

Use a certain amount of potassium dichromate solution and sulfuric acid. Under heating, the organic carbon in the organic-inorganic compound fertilizer is oxidized, and the remaining potassium dichromate solution is titrated with ferrous sulfate (or ferrous ammonium sulfate) standard titration solution. Do a blank test at the same time. According to the consumption of oxidant before and

V_3 - In the blank test, the volume of ferrous sulfate (or ferrous ammonium sulfate) standard titration solution consumed, in milliliters (mL);

V_4 - When measuring the test material, the volume of ferrous sulfate (or ferrous ammonium sulfate) standard titration solution consumed, in milliliters (mL);

c_2 - The concentration of ferrous sulfate (or ferrous ammonium sulfate) standard titration solution, in moles per liter (mol/L);

0.003 - The molar mass of a quarter of carbon, in grams per millimole (g/mmol);

1.5 - The oxidation correction factor;

w_1 - The chloride ion content in the specimen measured according to 6.11, %;

1/12 - The mass fraction of organic carbon equivalent to 1% chloride ion;

1.724 - The empirical conversion coefficient between organic carbon and organic matter;

m_0 - The mass of test material, in grams (g).

The calculation result is expressed to one decimal place. Take the arithmetic mean of the parallel measurement results as the measurement result.

6.4.6 Precision

The absolute difference of the parallel determination results is not more than 1.0%. The absolute difference between the results of different laboratories is not more than 1.5%.

6.5 Total nutrient content

6.5.1 Determination of total nitrogen content

Weigh the sample from the samples after milling in 6.2. Conduct according to the provisions of GB/T 17767.1 or 3.1 of GB/T 22923-2008. The method of GB/T 17767.1 is the arbitration method.

6.5.2 Determination of effective phosphorus pentoxide content

Weigh the sample from the samples after milling in 6.2. Conduct according to Annex A of GB/T 15063-2020 or GB/T 8573. Take Annex A of GB/T 15063-2020 as the arbitration method.

6.5.3 Determination of total potassium oxide content

Weigh the sample from the samples after milling in 6.2. Conduct according to the provisions of GB/T 17767.3.

6.7.6 Precision

The absolute difference of the parallel determination results is not more than 0.10pH.

6.8 Determination of particle size

According to GB/T 24891.

6.9 Determination of the mortality of roundworm eggs

According to GB/T 19524.2.

6.10 Determination of fecal coliform group

According to GB/T 19524.1.

6.11 Determination of chloride ion content

6.11.1 Volumetric method

6.11.1.1 Principle

The specimen is in a slightly acidic solution (if the filtrate is colored after the sample solution extracted with boiling water is filtered, mix the specimen and the Eschar mixed reagent, and burn to remove combustibles and convert chlorine to chloride). Add excess silver nitrate solution to convert chloride ions into silver chloride precipitation. Use dibutyl phthalate to coat the precipitate. Use ferric ammonium sulfate as indicator. Use ammonium thiocyanate standard titration solution to titrate the remaining silver nitrate.

6.11.1.2 Reagents or solutions

6.11.1.2.1 All reagents and materials in Chapter 4 of GB/T 24890-2010.

6.11.1.2.2 Silver nitrate solution: 10g/L.

6.11.1.2.3 Activated carbon.

6.11.1.2.4 Eschar mixed reagent: Mix magnesium oxide and anhydrous sodium carbonate at a mass ratio of 2:1. Grind to be less than 0.25mm. Mix well.

6.11.1.3 Instruments and equipment

6.11.1.3.1 Laboratory equipment is usually used.

6.11.1.3.2 Box-type resistance furnace: The temperature can be controlled at $(500\pm 20)^{\circ}\text{C}$.

Weigh the sample from the samples after milling in 6.2. Conduct according to NY/T 1972.

6.14 Determination of biuret content

Weigh the sample from the samples after milling in 6.2. Conduct according to the high-performance liquid chromatography in GB/T 22924.

7 Inspection rules

7.1 Inspection category and inspection items

Product inspection includes exit-factory inspection and type inspection. Appearance, organic matter content, total nutrient content, moisture, particle size, pH, chloride ion content, and sodium ion content are exit-factory inspection items. Type inspection items include all items in Chapter 4. Type inspection is carried out in one of the following situations:

- After formal production, if there are major changes in raw materials and processes, which may affect the quality of the product;
- During normal production, type inspection is carried out according to the cycle. Ascaris egg mortality, number of fecal coliforms, biuret, arsenic, cadmium, lead, chromium, mercury shall be inspected at least once every six months. Other items in 4.3 are inspected at least once every two years;
- When production is resumed after a long-term stop;
- When the government regulatory agency puts forward the need for type inspection.

7.2 Batching

The products are inspected in batches. Take one- or two-days' output as a batch. The maximum batch size is 500t.

7.3 Result determination

7.3.1 The conformity determination for product quality indicators in this Standard shall use "Rounding value comparison method" in GB/T 8170.

7.3.2 The manufacturer shall carry out exit-factory inspection and type inspection in accordance with the requirements of this Standard. When all the inspection items meet the requirements of this Standard, the batch of products shall be deemed conforming.

7.3.3 If one of the results of the exit-factory inspection or type inspection

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