

HG

CHEMICAL INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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Controlled-release fertilizers

控释肥料

(English Translation)

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009 Directives for standardization - Part 1: Structure and drafting of standards.

1 Scope

This Standard specifies the terms, requirements, test methods, inspection rules, marks, packaging, transport and storage of controlled release fertilizer.

This Standard applies to single, compound (combined), blending (BB) controlled release fertilizer made in various processes.

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 8170-2008, Rules of rounding off for numerical values & expression and judgement of limiting values

GB 8569, Packing of solid chemical fertilizers

GB/T 8572, Determination of total nitrogen content for compound fertilizers titrimetric method after distillation

GB/T 17767.3-1999, Determination of organic-inorganic compound fertilizers - Part 3. Total potassium content

GB 18382, Fertilizer marking - Presentation and declaration

GB 21633, Bulk Blending Fertilizer

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

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

HG/T 2843, Chemical fertilizer Products-standard volumetric, standard, reagent and indicator solutions for chemical analysis and preparation methods are not specified.

6 Test methods

6.10

The release content w_s of partial controlled release fertilizer, in mass fraction (%), is calculated according to equation (7). where, w - the mass fraction of total nitrogen, the mass fraction of total potassium or the sum of total nitrogen and potassium mass fraction measured according to 6.2 or 6.4, based on the marked controlled release nutrient type, in %; w_1 - the release contents of nitrogen or potassium measured according to 6.7.3.4;

6.1 Appearance

Use visual inspection method.

6.2 Determination of total chlorine content

Carry out according to the method specified in corresponding core product standard or the one specified in GB/T 22923. Take chemical method as the arbitration method.

6.3 Determination of water-soluble phosphorus and available

phosphorus as well as calculation of mass fraction of water-soluble phosphorus accounting for available phosphorus Carry out according to the method specified in corresponding core product standard or the one specified in GB/T 22923. Take chemical method as the arbitration method.

6.4 Determination of potassium content

Carry out according to the method specified in corresponding core product standard or the one specified in GB/T 22923. Take chemical method as the arbitration method.

6.5 Determination of moisture

Carry out according to the method specified in corresponding core product standard.

6.6 Determination of particle size

Choose the appropriate test sieve. Carry out according to the method specified in GB/T 24891.

6.7.1 Method summary

Use water to soak the test material. At the specified temperature and time, the nutrients in the sample are dissolved from the fertilizer particles into the water.

Use post-distillation titration or automatic analyzer to determine the total ammonia content. Use flame photometric method or gravimetric method or automatic analyzer method to determine the dissolved potassium content.

The conductivity method in Annex A or the spectrophotometric method in

Annex B can also be used to determine the dissolved nutrient content according to the controlled release nutrient in core product. The mass fraction shall be same.

Determine the extraction temperature of cumulative release rate of nutrient of stated release longevity of nutrient as 25°C, extraction time as days of indicated stated release longevity of nutrient; or as the indicated extraction temperature (15°C, 60°C or 100°C) of simulated inspection as well as corresponding days or hours. The detection result under this condition is expressed by wt.

6.7.3.3.1 Extraction at 25°C

Weigh about 10 g of the uncrushed test material in 7.4.2 (to the nearest 0.01 g) and put into a pouch made of nylon gauze with aperture of 150 µm (100 mesh). After sealing, place the pouch in a 250 mL glass or plastic bottle. Add into 200 mL of water. Cover it and seal. Place in a 25°C biochemical incubator.

The sampling time is 24 h, 3 d, 5 d, 7 d, 10 d, 14 d, 28 d, 42 d, 56 d. The time interval for subsequent sampling shall be based on the release of controlled release nutrients (the maximum interval must not exceed 28 d) until the cumulative release rate of nutrient exceeds 80%. When sampling, make the bottle up and down three times to make the liquid concentration in the bottle consistent. Move them all into a 250 mL volumetric flask. Cool to

room temperature and set volume to scale for the determination of nitrogen and potassium release contents according to 6.7.3.5, 6.7.3.6, respectively. Then, add 200 mL of water into the bottle loaded with test material pouch. Cover and seal. Then place into the biochemical incubator for continuous cultivation.

6.7.3.3.2 Extraction at 15°C, 60°C

The extraction temperatures shall be 15°C, 60°C. Carry out according to the steps of 6.7.3.3.1.

6.7.3.3.3 Extraction at 100°C

Weigh about 10 g of the uncrushed test material in 7.4.2 (to the nearest 0.01 g) and put into a stainless steel pouch of constant temperature rapid extraction instrument. Put into the closed extraction chamber. Add 200 mL of water. When the temperature is constant at (100 ± 1) °C, start timing. The sampling time is 1 h, 3 h, 5 h, 7 h, 10 h, 24 h, and the sampling interval shall be 6 h until the cumulative release rate of nutrient exceeds 80%. When sampling, move all the extraction liquid in the closed extraction chamber into a 250 mL volumetric flask. Cool to room temperature and set volume to scale for the determination of nitrogen and potassium release contents according to 6.7.3.5, 6.7.3.6, respectively. Add 200 mL of water. After sealing, continue the extraction of the next period. n - can be 1 d, 10 d, 14 d, respectively; m - can be 10 d, 21 d, 28 d, respectively.

6.9 The calculation of stated release longevity of nutrient of partial

controlled release fertilizer shall be same with 6.8.