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

MT/T 746-1997

**Technical condition for compound fertilizer of humic acids from
coal**
(English Translation)

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Foreword

This standard was prepared with reference to GB 11957-69 coal humic acid yield determination method, GB 15063-94 compound fertilizer and ZBG21005-87 sodium humate.

There are currently no international or national standards available.

Humic acid compound fertilizer is a new type of organic-inorganic compound (mixed) fertilizer, which can improve the physical and chemical properties of soil and improve the utilization of nutrients.

Rate, improve crop quality, improve crop stress resistance, and have obvious effects on increasing yield and income of various crops. In recent years, it has developed rapidly.

Industry spreads across the country. In order to make the industry develop healthily, this standard is specially formulated to strengthen management.

This standard is proposed by the Department of Science, Technology and Education of the Ministry of Coal Industry.

This standard is under the jurisdiction of the National Coal Standardization Technical Committee.

This standard was drafted. Luoyang Branch of Henan Coal Science Research Institute.

1 Scope

This standard specifies the technical requirements, determination methods, inspection rules, packaging, marking, transportation and storage of coal-based humic acid compound fertilizers.

This standard applies to compound fertilizers (including blended fertilizers and various

special fertilizers) based on coal humic acid.

2 Reference standards

The following standards contain provisions that, through reference in this standard, constitute provisions of this standard. When this standard was published, the editions shown were all is effective. All standards will be revised, and all parties using this standard should explore the possibility of using the latest versions of the following standards.

GB/T 6679-86 General rules for sampling solid chemical products GB/T 8572-88 Determination of total nitrogen content in compound fertilizers Titration method after distillation GB/T 8576-88 Determination of free water content in compound fertilizers Vacuum oven method GB/T 8577-88 Determination of free water content in compound fertilizer Karl Fischer method GB 15063-94 compound fertilizer

3 Technical requirements

3.1

Appearance. gray-black sphere or strip.

3.2

The product shall meet the requirements in Table 1.

4 Determination method

Except for special provisions in this standard, analytical reagents and distilled water or water of equivalent purity are used.

4.1 Appearance

Visual identification.

4.2.1 Method summary

Extract the humic acid from the sample with sodium pyrophosphate lye, precipitate the humic acid with excess inorganic acid, weigh the precipitate, and add to correct.

4.2.2.1 Hydrochloric acid (GB

622). 5% (V/V) solution.

4.2.2.2 Sodium pyrophosphate alkaline extraction solution. Weigh 15g of chemically pure sodium pyrophosphate ($\text{Na}_4\text{P}_2\text{O}_7 \cdot 10\text{H}_2\text{O}$) (HG3-1288) and 7g of chemically pure sodium hydroxide (GB 629) dissolved in 1L of distilled water and kept tightly closed.

4.2.3 Equipment

4.2.3.1

Analytical balance. Sensitivity 0.0001g.

4.2.3.2

Constant temperature water bath.

4.2.3.3

Constant temperature drying oven. The temperature can be controlled at $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

4.2.3.4

Centrifuge. The minimum speed is 2000r/min, and the volume of the centrifuge cup is greater than 150mL.

4.2.3.5

Muffle furnace.

4.2.3.6

Quantitative filter paper (blue ribbon).

4.2.3.7

Weighing bottle with ground stopper. 50mm in diameter and 30mm in height.

4.2.4.1 Extraction

Weigh about 1g of the analytical sample with a particle size of less than 0.2mm (accurate to 0.0002g), put it in a 250mL Erlenmeyer flask A, and add sodium pyrophosphate alkaline extraction solution 100 mL, shake well, cover a small funnel at the mouth of the conical flask, put it in a water bath at $100\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ (when the temperature is not reached, adjust with an appropriate amount of glycerin), heat and extract 2 h (shake every 0.5h), take it out, cool to room temperature, transfer it all into a centrifuge cup, and centrifuge at 2000r/min for 30min, Decant the solution into another 500mL Erlenmeyer flask B, wash the insolubles twice with 200mL of water, and centrifuge after each wash.

Collect all the washing liquid into Erlenmeyer flask B.

4.2.4.2 Precipitation

Transfer the conical flask B solution to a 500mL volumetric flask, add water to the mark, shake well, take 200mL of the solution into a beaker, and add 20mL of hydrochloric acid (4.2.2.1) Humic acid was allowed to settle, the suspension was centrifuged, and the supernatant was decanted.

4.2.4.3 Weighing

Dry the quantitative filter paper and weighing bottle in a drying box at 105 °C ~ 110 °C to constant weight in advance, and filter the humus obtained by 4.2.4.2 with filter paper.

For acid precipitation, move the filter paper with precipitation to a weighing bottle, dry it in a drying box at 105 °C ~ 110 °C for 2h, take it out, and cool it in a dryer to Weigh at room temperature (about 20min). Repeat drying, cooling and weighing until the difference between two consecutive weighings is less than 0.001g, and calculate the humic acid precipitation Mass of the sediment (m1).

4.2.4.4 Burn

Put the humic acid precipitate together with filter paper into a porcelain crucible of known quality, first ash at low temperature (200 °C ~ 250 °C), and then at 600 Burn in a muffle furnace at °C $\pm$ 25 °C for 1h ~ 2h, take out the crucible, cool it in the air for 5min, then put it in a desiccator to cool to room temperature and weigh.

Repeat the burning, cooling and weighing until the difference between two consecutive weighings is less than 0.001g, and calculate the mass (m2) of the burning residue.

5 Inspection rules

5.1

The product shall be inspected by the quality inspection department of the production plant, and the products shall not be delivered until the inspection is qualified and a quality certificate is issued. Quality certificate content Including. manufacturer's name, product name, batch number, product net weight, test results (which should indicate the nitrogen, phosphorus, potassium content and phosphorus basic fertilizer respectively Name), production date and this standard number.

5.2

The products are inspected by batches, with 1d or 2d output as a batch, and the maximum batch size is 500t.

5.3

When sampling in bags, take samples as specified in Table 2.

5.7

Judgment rule. If one of the indicators in the inspection results does not meet the requirements of this standard, it should be re-sampled from the double number of sampling bags.

If there is still an indicator that does not meet the requirements of this standard, the product