

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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Solid waste-Determination of water content and dry matter-Gravimetric method

固体废物 水分和干物质含量的测定 重量法

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1 Scope of application

This standard specifies the gravimetric method for the determination of moisture and dry matter content in solid waste.

This standard is applicable to the determination of moisture and dry matter content in common solid wastes, but not applicable to high volatile organic compounds, flammable and explosive Determination of moisture and dry matter content in solid waste samples.

2 Normative references

This standard refers to the following documents or clauses thereof. For dated references, only the dated version applies to this standard.

For undated references, the latest edition (including all amendments) applies to this standard.

HJ/T 20 Technical Specification for Sampling and Sample Preparation of Industrial Solid Waste
HJ 298 Technical Specification for Hazardous Waste Identification

3 Terms and Definitions

The following terms and definitions apply to this standard.

water content water content (OH₂w) Under the specified conditions, the mass fraction of the water evaporated from the solid waste accounts for the total mass of the sample.

dry matter content (dmw) the mass fraction of dry residues in solid waste under specified conditions.

constant weight constant mass After the samples were dried, the cooled samples were weighed continuously for 2 times at 4 h intervals, and the difference between before and after did not exceed the final measured quality.

1% of the weight, the weight at this time is the constant weight.

Note: When microwave drying method or infrared drying method is selected, under the condition that the sample is continuously dried and weighed by the moisture analyzer, the mass difference before and after within 10 s does not exceed the final measured mass.

0.01% of the weight, the weight at this time is the constant weight.

4 Principles of the method

The solid waste samples were dried at $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ to constant weight, and the moisture and dry matter contents were calculated based on the difference in sample mass before and after drying.

Expressed as a quality score.

5 Instruments and equipment

5.1

Oven. The temperature range is $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

5.2

Microwave moisture analyzer. the actual division value of the balance is less than or equal to 0.000 1 g, and the temperature range is $100\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$.

5.3

Infrared moisture analyzer. the actual scale division value of the balance is $\leq 0.000\text{ }1\text{ g}$, and the temperature range is $100\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$.

5.4

Desiccant. It is equipped with anhydrous color-changing silica gel.

5.5

Analytical balance. the actual division value is less than or equal to 0.01 g.

5.6

Container with lid. waterproof material and does not absorb moisture, volume ≥ 100 ml.

5.7

Common laboratory instruments and equipment.

6.1 Sample Collection and Storage

Sample collection and preservation shall be carried out in accordance with the relevant regulations of HJ/T 20 and HJ 298. Moisture and dry matter content should be performed as soon as possible after sample collection.

quantity measurement.

6.2 Specimen Preparation

In general, it can be directly sampled for determination. Sample preparation can also be performed in accordance with selected disposal specifications, evaluation specifications or analytical method standards.

Execute on request.

7.1 Oven drying method

Dry the container with lid (5.6) and the lid at $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for 1 h, cool slightly, cover the lid, and then put it in the desiccator (5.4) to cool but (about 45 min), weigh the mass m_0 of the container with the lid (accurate to 0.01 g). Flatten 25 g to 50 g solid waste samples with a sample scoop Put it into the weighed container with lid (5.6), cover the container, weigh the total mass m_1 (accurate to 0.01 g), put it in the oven (5.1), beat it.

Open the lid of the container and dry to constant weight at $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. Cover the container, put it in the desiccator (5.4) to cool (about 45 min), take out Weigh the total mass m_2 (accurate to 0.01 g) of the container with the lid and the dried sample immediately afterwards.

Note: For samples with high moisture content, the samples can be dried for 12 h, and then weighed at 4 h intervals.

7.2 Microwave drying method

According to the operation instructions of the microwave moisture analyzer (5.2), set the instrument parameters (including power and end point determination mode, etc.), and the temperature range is $105^{\circ}\text{C} \pm 5^{\circ}\text{C}$. Use a sample spoon to take an appropriate amount of

sample (select the appropriate sample size according to the requirements of the instrument, the recommended sample size range is 1.00 g~ 3.00 g) Spread on the sample tray of the instrument, cover the instrument, run the measurement program and read.

Note: For samples with poor uniformity, at least 3 parallel samples should be measured, and the results are expressed as the arithmetic mean.

7.3 Infrared drying method

According to the operating instructions of the infrared moisture analyzer (5.3), set the parameters of the instrument, and the temperature range is $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. Take a sample with a spoon (Choose the appropriate sample weight according to the requirements of the instrument, the recommended sample weight is about 3 g), lay it flat on the sample injection tray of the instrument, and cover the instrument cover, run the assay and read.

Note: For samples with poor uniformity, at least 3 parallel samples should be measured, and the results are expressed as the arithmetic mean.

8.1 Result calculation

The moisture content OH₂w and dry matter content dmw in the sample are calculated according to formula (1) and formula (2) respectively.

8.2 Result representation

The measurement result shall be retained to the integer, and when the measurement result is less than 1%, it shall be expressed as "9 Precision Seven verification laboratories used the oven drying method to test the waste incineration residue samples with a moisture content of about 9%, and the process samples with a moisture content of about 69%.

Sludge samples from industrial sewage treatment plants and sludge samples from domestic sewage treatment plants with a moisture content of about 85% were tested for 6 replicates. in the laboratory the relative standard deviations ranged from 1.7% to 8.0%, 0.08% to 1.0%, and 0.15% to 0.50%, respectively; the inter-laboratory relative standard deviations were 0.70% to 0.70%.

11%, and the repeatability limit was 0.69% to 1.2%.

2 verification laboratories used microwave drying method for waste incineration residue samples with a moisture content of about 9%, and work samples with a moisture content of about 69%.

Sludge samples from industrial sewage treatment plants and sludge samples from domestic sewage treatment plants with a moisture content of about 85% were tested for 6 replicates. in the laboratory the relative standard deviations ranged from 1.8% to 2.2%, 0.42% to 0.73%, and 0.78% to 1.0%, respectively.