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Methods for Chemical Analysis of Bauxite – Part 19: Determination of Loss on Ignition – Gravimetric Method

铝土矿化学分析方法 第 19 部分：灼减量的测定 重量法

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Table of Contents

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Warning - People who use this Document shall have practical experience in formal laboratory work. This Document does not point out all possible safety issues. Users are responsible for taking appropriate safety and health measures and ensuring that the conditions stipulated by relevant national laws and regulations are met.

1 Scope

This Document specifies the method for determining the loss on ignition in bauxite ores.

This Document is applicable to the determination of the loss on ignition in bauxite ores, with a determination range of 10.00% ~ 30.00%. Other types of aluminosilicates such as clay and kaolin can be used for reference.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

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

YS/T 575.20 Methods for chemical analysis of bauxite - Part 20: Preparation of pre-dried sample

YS/T 575.22 Methods for chemical analysis of bauxite - Part 22: Determination of hydroscopic moisture - Gravimetric method

3 Terms and Definitions

For the purposes of this Document, there are no terms and definitions apply.

4 Apparatus

4.1 Plate: flat bottom, the plate bottom area shall be no greater than 100 cm^2.

4.2 Crucible: platinum crucible or porcelain crucible, diameter is about 30 mm, height is about 45 mm. The porcelain crucible shall be burned in a high temperature furnace at 1075°C ± 25°C for at least 3 h before the first use.

4.3 High-temperature furnace: the temperature can be controlled at 1075°C ± 25°C.

4.4 Dryer: containing activated alumina (shall be heated at 300°C ± 10°C for 5 h before use) or color-changing silica gel (shall be heated at 120°C ± 5°C for 4 h before use).

4.5 Oven: the temperature can be controlled at 110°C ± 5°C; and air flow shall be ensured in the oven.

4.6 Analytical balance: the actual graduation value is 0.0001g.

4.7 Weighing bottle: with lid, large enough to hold the required specimen volume.

5 Air Balance Wet Water Correction Method

5.1 Principle

Weigh two specimens after air balance; one for air balance wet water content measurement, the other for loss on ignition measurement; use air balance wet water content correction to calculate loss on ignition.

5.2 Specimen

Take about 10 g of the sample that has passed through a 150μm standard sieve; spread it evenly on the bottom of the plate (4.1); and balance it in the air for more than 2 h.

5.3 Test procedures

5.3.1 Parallel test

Perform two parallel tests and take the average value.

5.3.2 Constant weight of crucible

5.3.2.1 Place the crucible (4.2) in a high-temperature furnace (4.3) at 1075°C ±25°C; heat and burn for 60 min ±2 min. Take it out and put it in a desiccator (4.4); cool it to room temperature (cooling time should not exceed 60 min); quickly take it out and weigh it, accurate to 0.0002 g.

6 Determination Method of Pre-Dried Specimen

6.1 Principle

The specimen pre-dried in an oven at 110°C ± 5°C is heated in a high-temperature furnace at 1075°C ± 25°C to constant weight; and the loss on ignition is calculated based on the difference in mass before and after heating.

6.2 Specimen

Place the ground specimen to pass through a 150μm standard sieve in a weighing bottle (4.7) and dry it in an oven (4.5) at 110°C ± 5°C to constant weight.

6.3 Test procedures

6.3.1 Parallel test

Perform two parallel tests and take the average value.

6.3.2 Crucible constant weight

Place the crucible (4.2) in a 1075°C±25°C high temperature furnace (4.3) and heat for 60min±2min. Take it out and let it cool slightly. Place it in a desiccator (4.4) and cool it to room temperature (cooling time should not exceed 60min). Take it out quickly and weigh it, accurate to 0.0002g. Place the crucible (4.2) in a 1075°C±25°C high temperature furnace (4.3) again and heat for 30min±2min. Take it out and let it cool slightly. Place it in a desiccator (4.4) and let it cool to room temperature (cooling time should not exceed 60min). Take it out quickly and weigh it, accurate to 0.0002g. Repeat this procedure for several times until the difference between two consecutive weighing is no more than 0.0005g. Record the last crucible mass (m_3).

6.3.3 Determination

6.3.3.1 Weigh 1.0g±0.1g of the pre-dried specimen (6.2) into a constant weight crucible (6.3.2), and record the weight of the pre-dried specimen (m_4), accurate to 0.0002g.

6.3.3.2 Place the crucible containing the pre-dried specimen (6.3.3.1, if a platinum crucible is used, the crucible containing the specimen shall be placed in a high-temperature furnace at 375°C±25°C and heated for 10min) in a high-temperature furnace (4.3) at 1075°C±25°C and heat for 60min±2min. Take it out and cool it slightly. Then place it in a desiccator (4.4); cool it to room temperature; take it out quickly and weigh it, accurate to 0.0002g. Place the crucible (6.3.3.1) in the same high-temperature furnace (4.3) and heat it at 1075°C±25°C for 30min±2min. After taking it out, cool it slightly; put it into the desiccator (4.4); cool it to room temperature (cooling time should not exceed 60min); quickly take it out and weigh it, accurate to 0.0002g. Repeat several times until the difference between two consecutive weighing is no more than 0.0005g; record the mass (m_5) of the crucible and the pre-dried specimen after the

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