

ICS 71.100.10
CCS H 21

YS

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

YS/T 438.5-2013

Replacing YS/T 438.5-2001

**Methods for physical performance determination of Sandy
alumina. Part 5: X-ray diffraction spectrum method for
determination of α -alumina content**

砂状氧化铝物理性能测定方法 第5部分：X-射线衍射法测定 α -氧化铝含量
(English Translation)

Issued on: January 1, 1970

Implemented on: January 1, 1970

Issued by: Ministry of Industry and Information Technology

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Foreword

YS/T 438 "sandy alumina determination of physical performance" is divided into five sections.

- Part 1. Determination of particle size distribution by sieving;
- Part 2. Determination of the abrasion index;
- Part 3. Determination of angle of repose;
- Part 4. Determination of specific surface area;
- Part 5. Determination of alpha- alumina content of X- ray diffraction.

This is Part 5.

The partial replacement of YS/T 438.5-2001 "Determination of alpha- alumina content of sandy alumina determination of physical performance X-ray diffraction method." this part is the "determination of alpha- alumina content of sandy alumina determination of physical performance X-ray diffraction method" YS/T 438.5-2001 of Revised, compared with YS/T 438.5-2001, the main changes are as follows.

- Increased reagent Chapter 3;
- Increased precision;
- Increase the content quality assurance and control.

This section drafted in accordance with GB/T 1.1-2009 given rules.

The non-ferrous metal part by the National Standardization Technical Committee (SAC/TC243) centralized.

This part mainly drafted by. Aluminum Corporation of China Guangxi Branch, Luoyang

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1 Scope

This section provides a method for determining X- ray diffraction sandy alumina content of the α - Al_2O_3 .

This section applies to the determination of sandy alumina content in α - Al_2O_3 .

Measuring range. $\leq 20.0\%$.

2 Method summary

In the same diffraction conditions were samples and standard samples (012) crystal face of the integrated intensity values measured in accordance with standard samples containing the α - Al_2O_3 the amount of the sample to calculate the content of α - Al_2O_3 .

3 Reagents

3.1

high purity alumina (99.99%).

3.2

aluminum hydroxide.

3.3

ethanol.

3.4

corundum crucible (100mL).

4 Instrument

4.1

agate mortar.

4.2

X- ray diffraction. General Instrument stability better than 0.5%, work on indicators see Appendix A.

4.3

Oven. Maximum operating temperature $300\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

4.4

high-temperature furnace. maximum operating temperature of $1600\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

5 Sample Preparation

5.1

The high purity alumina (3.1) in 100mL corundum crucible (3.4) was packed to 2/3, at 1450 °C $\pm$ 20 °C baking after 6h the resulting alumina regarded as containing alpha-Al₂O₃ (100.0%).

5.2

aluminum hydroxide (3.2) placed in 100mL corundum crucible (3.4) was packed to 2/3, after 700 °C $\pm$ 20 °C baking 4h prepared Alumina deemed free of alpha-Al₂O₃.

5.3

A sample (5.1), (5.2) drying 2h at 105 °C $\pm$ 5 °C, dubbed by the mass ratio alpha-Al₂O₃ content of 0,5.0%, 10.0%, respectively, 15.0%, 20.0% of the standard sample, and mix thoroughly ground to a particle size of less than 10 μ m.

6 Measuring step

6.1

adjusting X diffractometer (4.2) to reach a steady state measurement requirements.