

ICS 71.100.10

CCS H 12



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

**GB/T 6609.31-2009**

---

**Chemical analysis methods and determination of physical  
performance of alumina -- Part 31: Determination of angle of  
flow**

氧化铝化学分析方法和物理性能测定方法 第31部分：流动角的测定

**(English Translation)**

**Issued on: April 15, 2009**

**Implemented on: February 1, 2010**

---

**Issued by: Standardization Administration of China**

## Table of Contents

Foreword

1 Scope

2 Terms and definitions

3 PRINCIPLE OF THE METHOD

4 Instrument

5 Preparation, samples

### Foreword

GB/T 6609 "alumina chemical analysis methods and determination of physical performance" is divided into 37 parts.

--- Part 1. Inductively coupled plasma atomic emission spectrometry Determination of trace elements;

--- Part 2. Determination of 300 °C and 1000 °C mass loss;

--- Part 3. molybdenum blue spectrophotometric determination of silicon dioxide content;

--- Part 4. phenanthroline spectrophotometric determination of ferric oxide content;

--- Part 5. Determination of sodium oxide content;

--- Part 6. flame photometric determination of potassium content;

--- Part 7. Determination of titanium dioxide content of the two safety for DAM spectrophotometry;

--- Part 8. diphenyl carbon acid dihydrazide spectrophotometric determination of chromium oxide content;

--- Part 9. neocuproine spectrophotometric determination of copper oxide content;

--- Part 10. benzoyl phenylhydroxylamine extraction spectrophotometric determination of the content of vanadium pentoxide;

--- Part 11. Flame atomic absorption spectrometric method for the determination of manganese oxide content;

--- Part 12. Flame Atomic Absorption Spectrometry Determination of zinc oxide content;

--- Part 13. Flame atomic absorption spectrometric method for the determination of calcium oxide content;

- Part 14. lanthanum - alizarin complex spectrophotometric determination of fluorine content;
- Part 15. Rhodanate spectrophotometric determination of chlorine content;
- Part 16. Determination of curcumin boron trioxide content;
- Part 17. molybdenum blue spectrophotometric determination of phosphorus pentoxide content;
- Part 18. N, N- dimethyl-p-phenylenediamine spectrophotometric determination of sulfate content;
- Part 19. Flame atomic absorption spectrometry determination of lithium oxide content;
- Part 20. Flame atomic absorption spectrometric method for the determination of magnesium oxide content;
- Part 21. Butyl Rhodamine B spectrophotometric determination of gallium oxide content;
- Part 22. Sampling;
- Part 23. sample preparation and storage;
- Part 24. Determination of angle of repose;
- Part 25. Determination of bulk density;
- Part 26. Determination of effective density Pyknometer;
- Part 27. Particle size analysis by sieving;
- Part 28. less than 60µm fine powder particle size distribution measuring wet screening;
- Part 29. Assay index;
- Part 30. Determination of trace elements X-ray fluorescence spectrometry;
- Part 31. Determination of flow angle;
- The first part 32. alpha- alumina Determination of X- ray diffraction method;
- Part 33. Determination of the abrasion index;
- Part 34. Calculation of the content of aluminum oxide;
- Part 35. specific surface area by nitrogen adsorption method;
- Part 36. Determination of the flow of time;
- Part 37. Determination of particle size less than 20µm particle content.

This part is Part 31 GB/T 6609's.

The partial modification using AS2879.5-2004 "Alumina Part 5 flow angle determination."

when this part of the revised adoption AS2879.5-2004, delete its preface, table of contents, references and the first column of Table 1.

To facilitate comparison, are listed in Appendix B of this section and the corresponding clauses AS2879.5-2004 chapter of the table.

This section Appendices A and B are informative appendices.

This part is proposed by the China Nonferrous Metals Industry Association.

The non-ferrous metal part by the National Standardization Technical Committee.

Drafting this Part. Aluminum Corporation of China Zhengzhou Research Institute, China Nonferrous Metals Industry Standards and Metrology Institute for Quality.

## 1 Scope

GB/T 6609 This section specifies the method for determination of alumina flow angles.

This section applies to an alumina flow angle measurement, range.  $30^{\circ} \sim 50^{\circ}$ .

## 2 Terms and definitions

The following terms and definitions apply GB/T 6609 to the present section.

Angle test sample after the bottle stops flowing between the tapered surface and the test sample formed bottom formation. For calculation purposes, it is assumed cone Having a vertical side.

## 3 PRINCIPLE OF THE METHOD

Alumina through a series of funnel into the flat-bottomed vessel. Allow outflow flat container under the drain through the drain opening of alumina. According to the Filling a container with the sample container after the test quality and flow of memory calculated the angle of the quality of the sample.

**Note:** the flow angle is calculated see Appendix A.

## 4 Instrument

### 4.1

funnel. a diameter of  $110\text{mm} \pm 10\text{mm}$ , the internal diameter of the bottle diameter of  $10\text{mm} \pm 2\text{mm}$ .

Adjustable flow rate 4.2 funnel. wall smooth metal funnel, having a diameter of  $65\text{mm} \pm 5\text{mm}$ , the internal diameter of  $5.5\text{mm} \pm$  bottleneck  $0.5\text{mm}$ , length  $110\text{mm} \pm 20\text{mm}$ . The length of the funnel bottleneck is  $50\text{mm} \pm 5\text{mm}$ , the bottleneck at the bottom of the

termination of a square.

**4.3**

flat-bottomed container. inner diameter  $72.5\text{mm} \pm 0.1\text{mm}$ , inner height of  $72.5\text{mm} \pm 0.1\text{mm}$ , the leak diameter of  $4\text{mm} \pm 0.1\text{mm}$ , the thickness of the walls and the base of the leak is  $4.5\text{mm} \pm 0.1\text{mm}$ , the theoretical volume of the container to 300mL. This container should be made of aluminum, Wall smooth, flat surface machining reaches levels.

**4.4**

plugs. the size of just plugs directly plugged the leak flat bottom of the container.

**4.5**

plastic cup. volume of about 400mL.

**4.6**

ruler.

**4.7**

Oven. to maintain a constant temperature of  $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .

Level 4.8.

**4.9**

Balance. accurate to 0.1g.

## **5 Preparation, samples**

Approximately 500g test sample was taken out and dried overnight at  $110\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  in the oven, placed in active alumina or phosphorus pentoxide Dryer, cooled to room temperature.

**NOTE:** phosphorus pentoxide are dangerous goods. It shall indicate the material safety data sheet on the manual.

Step 6

6.1 Weighing plastic cup (4.5), accurate to 0.1g, referred to as m1 0.