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

YS/T 575.5-2007

**Methods for chemical analysis of bauxite. Part 5: Determination
of iron oxide content. Orthophenanthroline photometric method**

铝土矿石化学分析方法 第5部分：三氧化二铁含量的测定 邻二氮杂菲光度法
(English Translation)

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Foreword

YS/T 575-2007 Methods for Chemical Analysis of Bauxite is a modification to YS/T 575-2006 (formerly GB/T 3257-1999). It has 24 parts in total.

- Part 1.Determination of aluminum oxide content - EDTA titrimetric method;
- Part 2.Determination of silicon dioxide content - Gravimetric-molybdenum blue photometric method;
- Part 3.Determination of silicon dioxide content - Molybdenum blue photometric method;
- Part 4.Determination of iron oxide content - Potassium titrimetric method;
- Part 5.Determination of iron oxide content - Orthophenanthroline photometric method;
- Part 6.Determination of titanium dioxide content - Diantipyrylmethane photometric method;
- Part 7.Determination of calcium oxide content - Flame atomic absorption spectrophotometric method;
- Part 8.Determination of magnesium oxide content - Flame atomic absorption spectrophotometric method;

- Part 9.Determination of potassium oxide, sodium oxide content - Flame atomic absorption spectrophotometric method;
- Part 10.Determination of manganese oxide content - Flame atomic absorption spectrophotometric method;
- Part 11.Determination of chromium oxide content - Flame atomic absorption spectrophotometric method;
- Part 12.Determination of vanadium pentoxide content - N-benzoyl-N-phenylhydroxylamine photometric method;
- Part 13.Determination of zinc content - Flame atomic absorption spectrophotometric method;
- Part 14.Determination the total content of rare earth oxide Tribromo-arsenazo photometric method;
- Part 15.Determination of gallium oxide content - Rhodamine B-extraction photometric method;
- Part 16.Determination of phosphorus pentoxide content - Molybdenum blue spectrophotometric method;
- Part 17.Determination of sulfur content - Direct combustion-iodometric method;
- Part 18.Determination of total carbon content - Non-aqueous titrimetric method after combustion;
- Part 19.Determination of the loss on ignition - Gravimetric method;
- Part 20.Preparation of pre-dried sample;
- Part 21.Determination of organic carbon content titrimetric method;
- Part 22.Determination of hygroscopic moisture in analytical samples - Gravimetric method;
- Part 23.Determination of element contents X-ray fluorescence spectrometric method;
- Part 24.Determination of carbon content and sulfur content - Infrared absorption method.

This Part is Part 5.

This Part replaces YS/T 575.5-2006 (formerly GB/T 3257.5-1999).

This Part revises YS/T 575.5-2006. Compared with YS/T 575.5-2006, this Part has the major changes as follows.

- Change the concentrations of orthophenanthroline solution and hydroxylamine hydrochloride solution;
- Supplement the provisions of color-development temperature and time;
- Unify the drying temperature of the specimen to be $110^{\circ}\text{C}\pm 5^{\circ}\text{C}$;
- Add the precision.

This Part was proposed by and under the jurisdiction of National Technical Committee on Non-ferrous Metals of Standardization Administration of China.

Chief drafting organization of this Part. China Aluminum Corporation Zhengzhou Research Institute.

Drafting organization of this Part. China Aluminum Corporation Guizhou Branch.

Chief drafting staffs of this Part. Wang Baosheng, and Li Xiong.

This Part shall be interpreted by National Technical Committee on Non-ferrous Metals of Standardization Administration of China.

The historical edition replaced by this Standard is as follows.

- YS/T 575.5-2006 (formerly GB/T 3257.5-1999).

Methods for Chemical Analysis of Bauxite -

Part 5. Determination of Iron Oxide Content -

Orthophenanthroline Photometric Method

1 Scope

This Part specifies the determination of ferric oxide content in the bauxite.

This Part is applicable to the determination of ferric oxide content in the bauxite; the determination range. $\leq 5.00\%$.

2 Method Principle

The specimen is melted by alkali, leached by hydrochloric acid; and the ferric iron is reduced to ferrous iron with hydroxylamine hydrochloride under appropriate acidity. In an acetate buffer medium, ferrous iron and orthophenanthroline form a colored complex. The absorbance is measured at a wavelength of 510 nm.

3.7 Ferric oxide standard storage solution

Take 0.5000g of ferric oxide (99.99%), which was previously burned at 600°C for 2h, into a 250mL beaker; add a little water to moisten; and add 40mL of hydrochloric acid (3.2) along the cup wall. Cover the dish; heat until completely dissolved; and cool. Transfer to a 1000 mL volumetric flask; wash the beaker with water; and dilute to the scale with water; mix well. 1mL of this solution contained 0.5mg of ferric oxide.

4 Apparatus

Spectrophotometer.

5 Specimen

Grind the specimen by a mortar and pass through a 74μm sieve; dry the ground specimen at 110°C±5°C for 2h;

6.1 Specimen

Take 0.25g of specimen (5); accurate to 0.0001g.

6.2 Measurement times

The same specimen shall be measured for twice; and take their average value.

6.3 Blank test

Take the blank test with the specimen.

6.5 Drawing of working curve

Separately take 0.00mL, 0.50mL, 1.00mL, 2.00mL, 3.00mL, 4.00mL, 5.00mL, 6.00mL of ferric oxide standard solution (3.8) into a group of 100mL volumetric flasks. Operate