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JIS

JAPANESE INDUSTRIAL STANDARD

Methods for Chemical Analysis of Bauxite Ores

JIS M 8361—1968

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Methods for Chemical Analysis of Bauxite Ores

M 8361-1968
(Reaffirmed: 1984)

1. General

1.1 Scope This Japanese Industrial Standard specifies the methods for chemical analysis of bauxite ores.

1.2 General Matters General matters common to methods for chemical analysis shall comply with JIS K 0050 and general matters common to absorptiometry shall comply with JIS K 0115. In the measurement at an elevated temperature, a thermocouple, as a rule, shall be used. Where the use of a thermocouple is impracticable, an optical pyrometer may be used.

1.3 Method for Taking and Handling Samples From the sample taken and prepared in accordance with JIS M 8110, weigh out a quantity necessary for the analysis, thoroughly grind it into fine powder in an agate mortar, dry in an air bath at 105 to 110°C for about 2 h and preserve in a desiccator. Take a necessary amount from it for chemical analysis composition where required.

1.4 Blank Test Chemical analysis shall include blank tests to correct the analytical values obtained for all the procedure, except for the determination of loss on ignition in paragraph 2 and the determination of ferric oxide by the EDTA-H_2O_2 absorptiometry in paragraph 6.

1.5 Number of Analyses and Tolerances Repeat the analysis at least twice with the same sample. In case the values obtained by the procedure exhibit differences larger than the tolerances (%) given in the Table below repeat the procedure. Obtain the average of the values whose tolerances fall within the specified range.

Tolerances of Analytical Values (%)

Item of analysis	Loss on ignition	Total silicon dioxide	Reactive silicon dioxide	Alumina	Ferric oxide	Titan oxide
Tolerance	0.60	0.15	0.15	0.70	0.30	0.10

1.6 Method for Rounding-Off Analytical Values Express the analytical values in percentage, and round them off to two places of decimals in compliance with JIS Z 8401.

2. Determination of Loss on Ignition

2.1 Summary Ignite the sample at 1150 ± 50°C. After cooling, weigh it and take the weight loss as loss on ignition.

2.2 Weighing-Out Mass of Test Sample Weigh out 1 g of sample.

2.3 Procedure Perform the determination by the following procedures.

(1) Weigh out the sample into a crucible([1]). Heat slowly at first, dehydrate thoroughly, and ignite at 1150 ± 50°C for 1 hour with the crucible covered. Allow to cool in a desiccator for about 30 min and weigh.

(2) Ignite again for about 30 min and after allowing to cool in a desiccator for about 30 min, measure the weight. Repeat this procedure until a constant weight is obtained.

(3) Calculate the loss on ignition from the following formula:

$$\text{Loss on ignition } (\%) = \frac{w}{W} \times 100$$

where w: loss on ignition (g) determined in the procedure

W: weighed-out mass of sample (g)

Note ([1]) The crucible made of platinum should preferably be used.

3. Determination of Total Silica

3.1 Summary Heat and decompose the sample with mixed acid. Evaporate, cool, then idssolve soluble salts in warm water and filter out. (Use the filtrate in the determination of Al_2O_3, Fe_2O_3 and TiO_2.)

Ignite the residue, cool and weigh. Add HF to expel all silica, ignite and weigh. Determine the total silica from the weight loss.

3.2 Reagents and Their Preparation The reagents used in the procedure and the method for their preparation shall be as follows:

(1) Sulfuric acid (H_2SO_4)

(2) Sulfuric acid (H_2SO_4) (1+3, 1+20)

(3) Hydrofluoric acid (HF)

(4) Mixed acid: Prepare in the proportions of 450 ml of water, 150 ml of sulfuric acid (H_2SO_4), 100 ml of nitric acid (HNO_3) and 300 ml of hydrochloric acid (HCL).

(5) Potassium hydrogensulfate ($KHSO_4$)

3.3 Weighing-out Mass of Test Sample Weigh out 2 g of sample.

3.4 Procedure Perform the determination by the following procedures.

(1) Weigh out the sample into a 500 ml beaker. Add 100 ml of mixed acid and 20 ml of H_2SO_4. Cover with a watch glass and decompose by heating on a sand bath.

(2) After the sample has been decomposed, rinse the watch glass and the inside walls of the beaker with warm water. Evaporate carefully and continue heating for 30 to 40 min after white fumes begin to come out and then allow to cool.