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Specification Sheet

Product name: Kyowamag 150

Properties	Unit	Specification	Test Method
MgO (after ignited)	%	97.5 min.	M-13-j
Ignition loss	%	8.0 max.	M-12-n
Drying loss	%	1.0 max.	M-61-d
Fe ₂ O ₃ -Al ₂ O ₃	%	0.25 max.	KX-1-j
Acid insoluble substances	%	0.10 max.	M-10-k
Soluble matter	%	1.20 max.	M-4-i
Specific surface area (BET)	m ² /g	125 - 165	M-48-c
Apparent specific gravity	g/mL	0.30 - 0.40	M-44-d
Screen analysis on 150µm	-	trace	M-46-a
through 75µm	%	99.7 min.	M-46-a

Kenji Masuda

QA manager

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13.MgO

(M-13-j) Kyowa method ①

Accurately weigh about 200 mg of the test substance after ignition in the ignition loss test and put it into a 100 mL beaker, add 12 mL of 1 mol/L hydrochloric acid, put a watch glass on a 100 mL beaker and dissolve with heating. After cooling, transfer the solution to a 200 mL volumetric flask, dilute to volume with water and mix. Transfer 10 mL of this solution to a 200 mL beaker, add 80 mL of water, neutralize with 0.02 mol/L sodium hydroxide solution, add 2 mL of ammonia-ammonium chloride buffer solution (pH 10.7), and titrate with 0.01 mol/L disodium ethylenediaminetetraacetate solution (EDTA) by the use of automatic titration. The end point is that when the color changes to blue without reddish tint (indicator : eriochrome black T indicator). The operation procedure of automatic titration is based on SOP for Handling of Equipment for Inspection. From the volume of 0.01 mol/L EDTA consumed, deduct the volume of 0.01 mol/L EDTA corresponding to the content of calcium oxide in the magnesium oxide taken for the assay. The difference is the volume of 0.01 mol/L EDTA equivalent to the MgO in the portion of magnesium oxide taken.

[Calculation]

$$\begin{aligned} 1 \text{ mL of } 0.01 \text{ mol/L EDTA} &= 0.4030 \text{ mg MgO} \\ &= 0.5608 \text{ mg CaO} \end{aligned}$$

$$\text{MgO (\%)} = \frac{0.4030 \times (\text{EDTA [mL]} \times f - A \text{ [mL]})}{W \times \frac{10}{200}} \times 100$$

$$A \text{ mL} = W \times \frac{10}{200} \times \frac{\text{CaO (\%)}}{100} \times \frac{1}{0.5608}$$

A : 0.01 mol/L EDTA (mL) corresponding to CaO

f : Factor of 0.01 mol/L EDTA

W : Mass of the test substance (mg)

12. Ignition Loss

(M-12-n) Kyowa simple method

Weigh accurately a previously ignited crucible (W_1), put the test substance to about 2/3 of its volume, and weigh it accurately (W_2). Put it into the electrical oven, and ignite at 980 ± 25 °C for 2 hours. Cool it in a room for 15 minutes and then in a desiccator for 15 minutes. After cooling, weigh it accurately (W_3).

$$\text{Ignition loss (\%)} = \frac{W_2 - W_3}{W_2 - W_1} \times 100$$

Apparatus : a porcelain crucible with cover

61.Drying Loss

(M-61-d) Kyowa simple Method ①

Weigh accurately a weighing bottle, put the test substance into it, make the test substance 3 ~ 5 mm in thickness and weigh it accurately. Dry it in drying oven (105 ± 2 °C) for 1 hours. After cooling it in a desiccators, weigh it accurately.

[Notes]

Weighing bottle : diameter 40 mm
height 30 mm

The time for cooling : 30 ~ 60 minutes (desiccant : silica gel)

[Calculation]

$$\text{Loss on drying (\%)} = \frac{W(g) - A(g)}{W(g)} \times 100$$

W (g) : Mass of the test substance before drying

A (g) : Mass of the test substance after drying

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

KX-1-j-2

(KX-1-j) $\text{Fe}_2\text{O}_3 \cdot \text{Al}_2\text{O}_3$

Magnesium oxide

$$\text{Fe}_2\text{O}_3 \cdot \text{Al}_2\text{O}_3 (\%) = \text{Fe}_2\text{O}_3 (\%) + \text{Al}_2\text{O}_3 (\%)$$

Reference

$\text{Fe}_2\text{O}_3 (\%)$: KX-1-i

$\text{Al}_2\text{O}_3 (\%)$: KX-1-b

(KX-1-i) Fe, Fe₂O₃

Magnesium oxide

1. Instrument

X-ray Fluorescence Spectrometric Analyzer
Press machine

2. Sample preparation (press condition)

Pressure 18 MPa
Press time 5-8 sec

3. Operation procedure

The operation procedure of X-ray Fluorescence Spectrometric Analyzer is according to SOP for Handling of Equipment for Inspection.

4. Measuring condition

X-ray tube Rh
kv - mA 50 - 50
Crystal LIF1
Spectrum Fe - K α
Detector SC
Path VAC.
P.H.A DIFF

(KX-1-b) Al₂O₃

Magnesium oxide

1. Instrument

X-ray Fluorescence Spectrometric Analyzer

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2. Sample preparation (press condition)

Pressure 18 MPa

Press time 5-8 sec

3. Operation procedure

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4. Measuring condition

X-ray tube Rh

kv - mA 50 - 50

Crystal PET

Spectrum Al - K α

Detector F - PC

Path VAC.

P.H.A DIFF

10. Acid insoluble substances

(M-10-k) Kyowa simple method ②

Weigh 5.0 g of the test substance, add 75 mL of water and add 25 mL of hydrochloric acid while stirring. Dissolve with heating, and boil for 5 minutes. Transfer the solution to the glass microanalysis vacuum holder with two sheets of the filter paper (ϕ 47 mm, No. 5C), vacuum it (-20 ± 5 cm Hg). After wash, wipe inside the funnel with the filter paper and put the filter paper into a porcelain crucible (W_1), dry and ignite. After cooling, weigh it accurately (W_2).

$$\text{Acid insoluble substances (\%)} = \frac{W_2 \text{ (g)} - W_1 \text{ (g)}}{W \text{ (g)}} \times 100$$

W (g) : Mass of the test substance

4.Soluble Matter

(M-4-i) Kyowa method ①

Weigh 2.0 g of the test substance and put it into a 200 mL beaker. Add 100 mL of water, cover the beaker with a watch dish, and boil for 5 minutes. Add water to make the volume 100 mL, and filter. Transfer 25 mL of the filtrate to a weighing bottle which previously dried and weighed (W_1), and evaporate it to dryness, dry at 105 ± 3 °C for 1 hour. After cooling for 1 hour in desiccator and weigh it (W_2).

$$\text{Soluble matter (\%)} = \frac{W_2 - W_1}{2.0 \times \frac{25}{100}} \times 100$$

44. Apparent specific gravity

(M-44-d) Kyowa method

[Procedure]

Put the piston correctly into the cylinder, allow the piston to sink naturally, and confirm finally the length of projecting part at 0.00 cm. Draw out the piston, weigh out 2 g of the test substance accurate to 0.01 g, and pour it in the cylinder gently, and shake the cylinder lightly or give it little knocks to let fall the test substance adhering to the cylinder wall, and at the same time, to make the upper surface of the contents flat. Fall the piston correctly and gradually in the cylinder with fingers. The time required by the piston to reach the sample surface shall be 5 second, as a rule. The reaching of the piston to the sample surface shall be sensible by the fingers. When the piston has reached the sample surface, finish this procedure by giving the piston one turn lightly by fingers to settle the piston well. Measure the length of the part of piston extruding above the cylinder, and calculate the apparent specific gravity by the formula below.

$$\text{Apparent specific gravity (g/mL)} = \frac{S}{H \times 0.7854 \times D^2}$$

Where S : Mass of the test substance (g)

H : Length of the part of piston extruding above cylinder where test substance is present (cm)

D : Inside diameter of the cylinder (cm)

[Apparatus]

This apparatus made in reference to JIS K 6220. The cylinder shall be 22.00 +/- 0.05 mm in inside diameter and 100 mm in inside depth. The piston used shall be 21.80 +/- 0.05 mm in outside diameter, 115 mm in length and hollowed to be 190 g in mass.

46. Screen analysis

(M-46-a) Sieve test method ①

Weigh 20 g of the test substance, put it into a 200 mL beaker, add 200 mL of water, and stir. Pour the slurry onto a standard sieve, spray the residue with water, and brush it with a brush. Transfer the residue with water to a filter paper in a buchner funnel. Dry the residue with the filter paper at 105 ± 3 °C. After cooling, weigh the residue.

【Calculation】

$$\text{Sieve on (\%)} = \frac{\text{Mass of residue (g)}}{\text{Mass of test substance (g)}} \times 100$$

$$\text{Sieve through (\%)} = 100 - \text{Sieve on (\%)}$$

【Apparatus】

standard sieve diameter: 15 cm
 openings: varied according to test

filter paper No.2 (110 mm) one sheet

【Note】

The water used for this screen analysis shall be filtered by 5µm filter.