

JIS

JAPANESE INDUSTRIAL STANDARD

Dichromium trioxide

Ⓒ JIS K 1401—1992

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JAPANESE INDUSTRIAL STANDARD

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Dichromium trioxide

K 1401-1992

 Cr_2O_3 FW : 151.991. Scope

This Japanese Industrial Standard specifies dichromium trioxide for industrial use.

Remarks: The standards cited in this Standard are shown in Attached Table 1.

2. Grade

The grades shall be as follows.

- (1) The first grade
- (2) The second grade

3. Quality

The quality of dichromium trioxide shall follow Table 1 when tested according to the prescription in 5.

Table 1. Quality

Unit: %

Item	Grade	
	1st Grade	2nd Grade
Dichromium trioxide (Cr_2O_3)	98.5 min.	95.0 min.
Drying loss	0.3 max.	0.5 max.
Ignition loss (after drying)	0.2 max.	0.5 max.
Sulfate (as SO_4)	0.4 max.	1.0 max.

4. Sampling method

The sampling method shall be as follows.

- (1) Sampling shall be carried out immediately before packaging or immediately after unsealing the package.
- (2) The product produced under the same condition not exceeding 24 h before and thought to be the same quality, shall be regarded as 1 lot, and one increment shall be taken from every 1 ton of the product. The amount of one increment shall be 100 g.
- (3) All increments sampled according to (2) shall be put together, and, after satisfactory mixing, the mixture shall be reduced to prepare about 100 g of the sample.

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- (4) The sample shall be transferred into a wide-mouthed glass bottle with a ground stopper or polyethylene container, and preserved under an airtight sealing.
- (5) For other lots than (2), carry out the sampling according to the method decided by the parties concerned so as to make the sample represent the whole products, prepare the sample according to the method in (3), transfer it into a wide-mouthed glass bottle with a ground stopper or polyethylene container, and preserve it under an airtight sealing.

5. Test method

5.1 General matters General matters shall be as follows.

General matters common to this test shall be in accordance with JIS K 0050. The rounding-off of numerical value shall follow the prescription in JIS Z 8401.

5.2 Dichromium trioxide The determination of dichromium trioxide shall follow either of the following.

- (1) Titration method with indicator
- (2) Potentiometric titration method

5.2.1 Titration method with indication

- (1) Summary Fuse the sample with flux, dissolve it in hot water, add sulfuric acid, and titrate it with ammonium iron (II) sulfate solution using ferroin solution as an indicator to determine dichromium trioxide.
- (2) Reagents The reagents shall be as follows.
 - (a) Sulfuric acid (1 + 1) Prepare by using sulfuric acid specified in JIS K 8951.
 - (b) Flux Mixture of sodium peroxide specified in JIS K 8231 and sodium carbonate (anhydrous) specified in JIS K 8625 by the mass ratio of 2 : 1.
 - (c) Ferroin solution Dissolve 0.695 g of iron (II) sulfate specified in JIS K 8978 in water, dissolve in this solution either 1.49 g of 1,10-phenanthroline, monohydrate specified in JIS K 8789 or 1.76 g of 1,10-phenanthroline chloride monohydrate specified in JIS K 8202, and dilute this with water up to 100 ml.
 - (d) 0.2 mol/l ammonium iron (II) sulfate solution Dissolve 80 g of ammonium iron (II) sulfate specified in JIS K 8979 in 900 ml of water, and add 100 ml of sulfuric acid (1 + 1).

Standardization When it is used, it shall be standardized with a definite amount of potassium dichromate standard solution according to (4).

- (e) Potassium dichromate standard solution Grind potassium dichromate specified in JIS K 8005 in an agate mortar, dry it in a thermostat maintained at 150°C for 1 h, and let it be alone for cooling in a desiccator with silica gel. Weigh about 16 g to the nearest 0.1 mg, dissolve it in water, transfer it in a 1000 ml volumetric flask, and dilute it with water up to the marked line.

Measure the temperature of this standard solution t_1 °C⁽¹⁾.

Note (1) The temperature shall be measured by the unit of 1°C.

- (3) Apparatus Crucible Made of alumina or nickel, measuring about 30 ml capacity.
- (4) Procedure The procedures shall be as follows.
- (a) Weigh about 1 g of the sample in a crucible to the nearest 0.1 mg.
 - (b) Add about 8 g of flux, mix well, add about 2 g of flux to make a layer on it, and cover it with a lid.
 - (c) Heat gently at first to fuse it, and heat it strongly until its inside shows dark red color for about 10 min.
 - (d) After cooling, put it in a 500 ml beaker together with the crucible, add about 200 ml hot water to dissolve the content, and take out the crucible while rinsing it with warm water.
 - (e) Boil it for about 20 min to decompose sodium peroxide and expel hydrogen peroxide.
 - (f) While covering it with a watch glass to keep the content from escaping, add gradually about 50 ml of sulfuric acid (1 + 1) to dissolve undissolved matter, boil for several minutes, cool it, transfer it into a 500 ml volumetric flask, and add water up to the marked line.
 - (g) Take 100 ml aliquot from this solution using a volumetric pipette into a 500 ml beaker, add water up to about 400 ml, and add 35 ml of sulfuric acid (1 + 1).
 - (h) Titrate it with 0.2 mol/l ammonium iron (II) sulfate solution, and when yellow owing to chromic acid nearly disappears, add 3 drops of ferroin solution. Titrate little by little, and find an end point where it turns reddish brown from blue and the color lasts at least for about 30 s.
 - (i) Measure the temperature of potassium dichromate standard solution t_2 °C⁽¹⁾, take its 25 ml using a volumetric pipette into another 500 ml beaker, add water up to about 400 ml, add 40 ml of sulfuric acid (1 + 1), and carry out the procedure in (h).