

JIS

JAPANESE INDUSTRIAL STANDARD

**Methods for Emission
Spectrochemical Analysis
of Titanium**

JIS H 1630—1975

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Methods for Emission Spectrochemical
Analysis of TitaniumH 1630-1976
(Reaffirmed: 1983)

1. Scope

This Japanese Industrial Standard specifies the methods for emission spectrochemical analysis of JIS H 2151, JIS H 4600, JIS H 4630, JIS H 4631, JIS H 4650 and JIS H 4670.

2. General Matters

General matters common to the analysis methods shall be in accordance with JIS H 1611 and JIS Z 2612.

3. Sampling and Handling of Sample

The sampling and handling of sample shall be in accordance with JIS H 1610 and JIS H 1611.

4. Methods for Determination

4.1 Classification of Methods The method for emission spectrochemical analysis of titanium shall be in accordance with either one of the following methods:

- (1) Solution Method This method applies to determination of the iron, manganese, silicon and magnesium in titanium.
 - (A) High-tension spark discharge method
 - (B) d.c. arc discharge method
- (2) Solid Metal Method This method applies to determination of the iron, manganese and silicon in titanium.
 - (C) Low-tension capacitor discharge method
 - (D) Intermittent a.c. arc discharge method

4.2 Solution Method

4.2.1 Summary A sample is decomposed by hydrochloric acid, put into the auxiliary electrode with reservoir cup and emitted by high-tension spark discharge. Otherwise, the auxiliary electrode obtained by letting the sample solution permeate a graphite electrode is emitted by d.c. arc discharge. The spectrum is photographed by using a spectrograph and the intensity of spectral line is measured.

Applicable Standards: See page 10.

4.2.2 Method for Preparation of Sample Solution The method for preparation of sample solution shall be as follows.

- (1) **Method for Preparation of Analysis Sample Solution** Weigh out 2 g of a sample into a polyethylene beaker (300 ml), cover it with a polyethylene watch glass, add 40 ml hydrochloric acid and 10 ml water and decompose it by heating on a boiling water bath. After standing to cool, transfer it into a measuring flask of 50 ml, dilute it up to the marked line with water and sufficiently mix them by shaking to prepare the analysis sample.
- (2) **Method for Preparation of Standard Sample Solution Series**
 - (a) **Preparation Method by Titanium Tetrachloride Aqueous Solution** Accurately take titanium tetrachloride aqueous solution⁽¹⁾ equivalent to 2 g as titanium into several measuring flasks of 50 ml, respectively accurately add a fixed amount of standard solutions of (a) to (d) of 4.2.2 (3) in accordance with Table 1, as appropriate to each of them, dilute it up to the marked line with water and mix them by shaking to prepare the standard sample solution series.

Table 1. Example of Additional Amount of Standard Solution

Unit: mg

Element Series	Fe	Si	Mn	Mg
1	0.2	0.1	0.02	0.1
2	1.0	0.2	0.04	0.2
3	2.0	0.4	0.08	0.4
4	4.0	0.6	0.1	0.6
5	8.0	0.8	0.2	0.8

Note ⁽¹⁾ Weigh out 100 ml titanium tetrachloride (JIS K 8460) into a dry separatory funnel, drop little by little it into the flask (500 ml) containing 100 ml ice cooled water and dissolve it sufficiently while mixing them by stirring. Thereafter, store it in a polyethylene bottle. Take a fixed amount of this solution, analyze it in accordance with JIS M 8311, as appropriate, and obtain the concentration of titanium.