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**Ferroalloys — General rules for chemical
analysis**

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In the event of any doubts arising as to the contents,
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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Ferroalloy Association (JFA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently JIS G 1301:2008 is replaced with this Standard.

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Ferroalloys — General rules for chemical analysis

1 Scope

This Japanese Industrial Standard specifies general requirements for analyses of ferroalloys in the standards which define the analysis methods for each component in ferroalloys specified in Japanese Industrial Standard (JIS) (JIS G 2301 to JIS G 2304, JIS G 2306 to JIS G 2316, JIS G 2318 and JIS G 2319) (hereafter referred to as the “standard series of chemical analysis of ferroalloys”) (Table 1).

Table 1 Chemical analysis of ferroalloys

No. of JIS for analysis method	Title of JIS	Analyte or type/analyte
JIS G 1311-1 to 7	Method for chemical analysis of ferromanganese Parts 1 to 7	Mn, C, Si, P, S, B, N
JIS G 1312-1 to 6	Method for chemical analysis of ferrosilicon Parts 1 to 6	Si, C, P, S, Al, Ti
JIS G 1313-1 to 6	Method for chemical analysis of ferrochromium Parts 1 to 6	Cr, C, Si, P, S, N
JIS G 1314-1 to 6	Method for chemical analysis of silicomanganese Parts 1 to 6	Mn, Si, C, P, S, B
JIS G 1316	Method for chemical analysis of ferrotungsten	W, C, Si, Mn, P, S, Sn, Cu, As, Sb, Bi
JIS G 1317	Method for chemical analysis of ferromolybdenum	Mo, C, Si, P, S, Cu, Al
JIS G 1318	Method for chemical analysis of ferrovanadium	V, C, Si, P, S, Al
JIS G 1319	Methods for chemical analysis of ferrotitanium	Ti, C, Si, Mn, P, S
JIS G 1320	Ferrophosphorus — Methods for determination of phosphorus content	P
JIS G 1321-1 to 5	Method for chemical analysis of manganese metal Parts 1 to 5	C, Si, P, S, Fe
JIS G 1322-1 to 7	Method for chemical analysis of metallic silicon Parts 1 to 7	Si, C, P, S, Fe, Al, Ca
JIS G 1323	Methods for chemical analysis of chromium metal	Cr ^{a)} , C, Si, P, S, Fe, Al
JIS G 1324	Methods for chemical analysis of calcium-silicon	Ca, Si, C, P

Table 1 (concluded)

No. of JIS for analysis method	Title of JIS	Analyte or type/analyte
JIS G 1325-1 to 5	Method for chemical analysis of ferrosilicochromium Parts 1 to 5	Si, Cr, C, P, S
JIS G 1326	Methods for chemical analysis of ferronickel	Ni, Co, C, Si, Mn, P, S, Cr, Cu
JIS G 1327-1 to 4	Methods for chemical analysis of ferroboron Parts 1 to 4	B, C, Si, Al
JIS G 1328	Methods for chemical analysis of ferroniobium	Nb, Ta, C, Si, P, S, Sn, Al
JIS G 1351	Ferroalloys — Method of X-ray fluorescence spectrometric analysis	Ferromanganese/Mn, Si, P, ferrosilicon/Si, Al, P, ferrochromium/Cr, Si, P, silicomanganese/Mn, Si, P, metallic silicon/Al, Fe, Ca, ferrosilicochromium/Si, Cr, P, ferroboron/B, Si, Al, P
Note ^{a)} Remainder after determination of carbon, silicon, phosphorus, sulfur, iron and aluminium.		

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 1501 *General rules for sampling of ferroalloys*

JIS G 1601 *Methods of sampling for chemical analysis of ferroalloys (Part 1 : Ferromanganese, ferrosilicon, ferrochromium, ferrosilicomanganese and ferrosilicochromium)*

JIS G 1602 *Methods of sampling for chemical analysis of ferroalloys (Part 2 : Ferrotungsten, ferromolybdenum, ferrovanadium, ferrotitanium and ferroniobium)*

JIS G 1603 *Methods of sampling for chemical analysis of ferroalloys (Part 3 : Ferrophosphorus, manganese metal, silicon metal, chromium metal, calcium silicon and ferroboron)*

JIS G 1604 *Methods of sampling for chemical analysis of ferroalloys (Part 4 : Ferronickel)*

JIS G 2301 *Ferromanganese*

JIS G 2302 *Ferrosilicon*

JIS G 2303 *Ferrochromium*

JIS G 2304	<i>Silicon-Manganese</i>
JIS G 2306	<i>Ferrotungsten</i>
JIS G 2307	<i>Ferromolybdenum</i>
JIS G 2308	<i>Ferrovanadium</i>
JIS G 2309	<i>Ferrotitanium</i>
JIS G 2310	<i>Ferrophosphorus</i>
JIS G 2311	<i>Manganese metal</i>
JIS G 2312	<i>Silicon metal</i>
JIS G 2313	<i>Chromium metal</i>
JIS G 2314	<i>Calcium silicon</i>
JIS G 2315	<i>Silicon-Chromium</i>
JIS G 2316	<i>Ferronickel</i>
JIS G 2318	<i>Ferroboron</i>
JIS G 2319	<i>Ferroniobium</i>
JIS K 0050	<i>General rules for chemical analysis</i>
JIS K 0113	<i>General rules for methods of potentiometric, amperometric, coulometric, and Karl Fischer titrations</i>
JIS K 0115	<i>General rules for molecular absorptiometric analysis</i>
JIS K 0116	<i>General rules for atomic emission spectrometry</i>
JIS K 0117	<i>General rules for infrared spectrophotometric analysis</i>
JIS K 0119	<i>General rules for X-ray fluorescence analysis</i>
JIS K 0121	<i>General rules for atomic absorption spectrometry</i>
JIS K 0211	<i>Technical terms for analytical chemistry (General part)</i>
JIS K 0557	<i>Water used for industrial water and wastewater analysis</i>
JIS K 8001	<i>General rule for test methods of reagents</i>
JIS R 3505	<i>Volumetric glassware</i>
JIS Z 2615	<i>General rules for determination of carbon in metallic materials</i>
JIS Z 2616	<i>General rules for determination of sulfur in metallic materials</i>
JIS Z 8101-1	<i>Statistics — Vocabulary and symbols — Part 1 : General statistical terms and terms used in probability</i>
JIS Z 8301	<i>Rules for the layout and drafting of Japanese Industrial Standards</i>
JIS Z 8401	<i>Guide to the rounding of numbers</i>
JIS Z 8402-1	<i>Accuracy (trueness and precision) of measurement methods and re-</i>

sults — Part 1 : General principles and definitions

JIS Z 8402-6 *Accuracy (trueness and precision) of measurement methods and results — Part 6 : Use in practice of accuracy values*

JIS Z 8801-1 *Test sieves — Part 1 : Test sieves of metal wire cloth*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS K 0050, JIS K 8001, JIS Z 8101-1, JIS Z 8301 and JIS Z 8402-1, and the following apply. The terms used for operations in the standard series of chemical analysis of ferroalloys are given in Annex A.

NOTE : This Standard adopts definitions of chemical analysis terms given in JIS K 0211, JIS K 0212, JIS K 0213, JIS K 0214, JIS K 0215 and JIS K 0216, considering that clause 3 of JIS K 0050 cites those standards as well.

3.1 chemical analysis

generic term for determinations of analyte, e.g. gravimetric method ¹⁾, gas volumetric method, titrimetry ²⁾, molecular absorption spectrometry, atomic absorption spectrometry, inductively coupled plasma [ICP ³⁾] atomic emission spectrometry, infrared absorption method, conductivity method, coulometric method

NOTE : Titrimetry, molecular absorption spectrometry, atomic absorption spectrometry and ICP atomic emission spectrometry are defined in JIS K 0211.

Notes ¹⁾ The standard series of chemical analysis of ferroalloys uses gravimetric method instead of gravimetric analysis which is used in JIS K 0211, in order to conform to the term used in standards of other analysis methods.

²⁾ The standard series of chemical analysis of ferroalloys adopts the following types of titrimetry: acid-base titration, oxidation-reduction titration, complexometric titration and their back titration, and potentiometric titration. These types of titrimetry are specified in JIS K 0211.

³⁾ Abbreviation for inductively coupled plasma, ICP, is given in JIS K 0116.

3.2 instrumental analysis

determination of analyte by X-ray fluorescent analysis

NOTE : X-ray fluorescent analysis is specified in JIS K 0211.

3.3 gas volumetric method

determination of analyte by turning it into a gaseous compound, allowing an absorbing solution to absorb the product, and measuring the volume reduced

3.4 visual titration

titrimetry to determine the end point of titration by visually observing the change in colour of an indicator

Although it is normally called titrimetry, the term visual titration is used to make a