

# JIS

JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

---

---

JIS R 1616 : 2007  
(AIST)

**Methods for chemical analysis of fine  
silicon carbide powders for fine ceramics**

---

ICS 81.060.30

Reference number : JIS R 1616 : 2007 (E)

PROTECTED BY COPYRIGHT

Date of Establishment: 1994-04-01  
Date of Revision: 2007-06-20  
Date of Public Notice in Official Gazette: 2007-06-20  
Investigated by: Japanese Industrial Standards Committee  
Standards Board  
Technical Committee on Ceramics

---

JIS R 1616 : 2007, First English edition published in 2008-07

---

Translated and published by: Japanese Standards Association  
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

---

In the event of any doubts arising as to the contents,  
the original JIS is to be the final authority.

© JSA 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized  
in any form or by any means, electronic or mechanical, including photocopying and microfilm, without  
permission in writing from the publisher.

Printed in Japan

NH/HN

## Contents

	Page
1 Scope .....	1
2 Normative references .....	1
3 General items .....	1
4 Analysis items .....	1
5 Sampling and handling of sample .....	2
5.1 Sampling .....	2
5.2 Handling of sample .....	2
5.3 Weighing method of sample .....	2
6 Obtaining analytical values .....	2
6.1 Number of analyses .....	2
6.2 Blank test .....	2
6.3 Indication of analytical values .....	2
6.4 Investigation and adoption of analytical values .....	3
7 Determination method of total silicon .....	3
7.1 Classification of determination method .....	3
7.2 Dehydrated mass determination and ICP emission spectrometry combined method .....	3
7.3 Agglomerated mass determination and ICP emission spectrometry combined method .....	6
8 Determination method of total carbon .....	8
8.1 Classification of determination method .....	8
8.2 Combustion (resistive heating) – infrared ray absorption method .....	8
8.3 Combustion (high-frequency heating) –infrared ray absorption method (or thermal conductivity method) .....	11
9 Determination method of free silicon .....	13
9.1 Determination method .....	13
9.2 Hydrogen gas generation – gas volume method .....	14
10 Determination method of free silicone dioxide .....	16
10.1 Determination method .....	16
10.2 Hydrofluoric acid · hydrochloric acid fusion – molybdenum blue absorptiometry .....	16
11 Determination method of free carbon .....	18
11.1 Classification of determination method .....	18
11.2 Stepwise combustion at 550 °C – 850 °C – weight correction method .....	18
11.3 Combustion at 850 °C – weight correction method .....	20

12	Determination method of aluminium, iron, calcium and magnesium .....	22
12.1	Determination method .....	22
12.2	Sodium carbonate fusion – ICP emission spectrometry method .....	22
12.3	Pressurized acid decomposition – ICP emission spectrometry method .....	24
13	Determination method of oxygen .....	27
13.1	Determination method .....	27
13.2	Inert gas fusion – infrared ray absorption method .....	27
14	Determination method of nitrogen .....	31
14.1	Determination method .....	31
14.2	Inert gas fusion – thermal conductivity method .....	31
15	Determination method of fluorine .....	33
15.1	Classification of determination method .....	33
15.2	Thermal hydrolysis separation – ion chromatography method .....	34
15.3	Thermal hydrolysis separation – absorptiometry method .....	36
16	Determination method of chlorine .....	38
16.1	Classification of determination method .....	38
16.2	Thermal hydrolysis separation – ion chromatography method .....	38
16.3	Thermal hydrolysis separation – absorptiometry method .....	39
	Annex A (informative) Analysis distribution diagram .....	42

## 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 Advanced Industrial Science and Technology (AIST) 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 R 1616 : 1994 is replaced with this Standard.

This JIS document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

# Methods for chemical analysis of fine silicon carbide powders for fine ceramics

## 1 Scope

This Japanese Industrial Standard specifies the methods for chemical analysis of fine silicon carbide powders used as the raw material for manufacture of fine ceramics.

## 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 K 0050 *General rules for chemical analysis*
- JIS K 0115 *General rules for molecular absorptiometric analysis*
- JIS K 0116 *General rules for atomic emission spectrometry*
- JIS K 0127 *General rules for ion chromatographic analysis*
- JIS K 0557 *Water used for industrial water and wastewater analysis*
- JIS K 8001 *General rule for test methods of reagents*
- JIS K 8007 *General rule for test methods of highly purified reagents*
- JIS R 6003 *Method for sampling of abrasive grains*
- JIS Z 8401 *Guide to the rounding of numbers*

## 3 General items

General items common to the analysis method shall be in accordance with JIS K 0050, JIS K 0115, JIS K 0116, JIS K 0127, JIS K 8001 and JIS K 8007.

## 4 Analysis items

Analysis items specified in this Standard shall be as follows.

- a) Total silicon (T.Si)
- b) Total carbon (T.C)
- c) Free silicon (F.Si)
- d) Free silicone dioxide (F.SiO<sub>2</sub>)