SAFETY DATA SHEET

1. IDENTIFICATION OF SUBSTANCE / PREPARATION AND OF THE COMPANY

Product Name	**Certified by Technical Association of Refractories, Japan Standard Reference Materials for Sulfur Analysis(Class I) JRRM1101, 1102, 1103, 1104, 1105&1106**
Manufacturer	**The Technical Association of Refractories, Japan**
Address	**New Ginza Bldg.,7-3-13,Ginza,Chuo-ku,Tokyo 104-0061, Japan**
Phone number	**+81-3-3572-0705**
Fax number	**+81-3-3572-0175**
Distributer	**SEISHIN TRADING CO., LTD.**
Address	**1-4-4, Minatojima-Minamimachi, Chuo-ku, Kobe 650-0047, Japan**
Phone number	**+81-78-303-3810**
Fax number	**+81-78-303-3822**
Emergency phone number	**+81-3-3572-0705**
E-mail	**taigikyou@tarj.org**
Recommended use of the chemical and restriction on use	**This material is used as standard material for calibration curve, standardized sample, sample for analytical accuracy test etc in sulfur analysis. When using this product under other uses or under special conditions, please be evaluated and take the best safety measures under your own responsibility.**

2. HAZARDS IDENTIFICATION

GHS classification

Physical Hazards	**Flammable solids**	**Not classified**
	Pyrophoric solids	**Not classified**
	Self-heating substances and mixtures	**Not classified**
	Substances and mixtures, which in contact with water, emit flammable gases	**Not classified**
	Oxidizing solids	**Not classified**
Health Hazards	**Acute toxicity (oral)**	**Not classified**
	Acute toxicity (dermal)	**Not classified**
	Acute toxicity (inhalation: dust, mist)	**Not classified**
	Skin corrosion/irritation	**Category 1C**
	Serious eye damage/eye irritation	**Category 1**
	Skin/Respiratory sensitizer	**Not classified**
	Germ cell mutagenicity	**Not classified**
	Carcinogenicity	**Category 1A**
	Specific target organ systemic toxicity (single exposure)	**Category 1(respiratory system) Category 2(respiratory tract) Category 3(respiratory tract irritation)**

2. HAZARDS IDENTIFICATION

	Specific target organ systemic toxicity (repeated exposure)	Category 1(respiratory system, kidney and lung)
Environmental Hazards	Acute hazards to the aquatic environment	Not classified
	Chronic hazards to the aquatic environment	Not classified

*** Unstated information is either 'classification not possible or 'not applicable'**

Pictogram or Symbol

Signal word Danger

Hazard Statement

H314: Causes severe skin burns and eye damage

H335: May cause respiratory irritation

H350: May cause cancer

H370: Causes damage to respiratory system

H371: May cause damage to respiratory tract

H372: Causes damage to respiratory system, kidney and lung through prolonged or repeated exposure

<Prevention>

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P264: Wash hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

<Response>

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340: IF INHALED: Remove person to fresh air and comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313: IF exposed or concerned: Get medical advice/attention.

P310: Immediately call a POISON CENTER/doctor/...

2. HAZARDS IDENTIFICATION

	P314: Get Medical advice/attention if you feel unwell.
	P363: Wash contaminated clothing before reuse.
<Storage>	**P403+P233: Store in a well ventilated place. Keep container tightly closed.**
	P405: Store locked up.
<Disposal>	**P501: Dispose of contents/container to in accordance with local regulations and statutory provisions.**

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance/Mixture **Mixture**

Chemical identity	CAS-No	Concentration (%)	EC-No	Hazard statement Codes
Cristobalite	14464-46-1	0.0 – 79.4	238-455-4	H350, H370, H372
Aluminium oxide	1344-28-1	12.4 – 98.3	215-691-6	H335, H372
Diiron trioxide	1309-37-1	0.0 – 1.9	215-168-2	H315, H318, H335, H372
Titan oxide	13463-67-7	0.0 – 1.1	236-675-5	H320, H335, H372
Calcium oxide*	1305-78-8	0.0 – 0.3	215-138-9	H315, H318, H370, H372
Magnesium oxide	1309-48-4	0.0 – 1.6	215-171-9	-
Potassium oxide*	12136-45-7	0.1 – 3.5	235-227-6	-
Sulfur**	7704-34-9	0.1 – 5.0	231-722-6	H370, H373
Iron sulfide**	12068-85-8	0.3 – 2.8	235-106-8	-
Calcium sulfate**	7778-18-9	0.0 – 12.8	231-900-3	H335
Potassium sulfate**	7778-80-5	0.0 -27.3	231-915-5	-

*** Calcium and potassium oxides are present in JRRM1101 and 1103.**
****Sulfur in JRRM1101 and 1103 exists in the form of iron sulfide. Sulfur in JRRM1104 and 1106 exists in the form of Calcium sulfate. Sulfur in JRRM1102 and 1105 exists in the form of Potassium sulfate.**

4. FIRST AID MEASURES

If inhaled:	**If inhaled plenty of dust, immediately remove victim to fresh air. If the victim shows breathing abnormality, immediately get medical advice/attention.**
If on skin:	**Wash with soap and water.**
If in eyes:	**If dust contact with eyes, immediately rinse with clean water or eyewash. If abnormality persists, get medical advice/attention.**
If swallowed:	**Rinse mouth with water. Immediately get medical advice/attention.**

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	**The product is not flammable. Use extinguishing media appropriate to surrounding fire conditions.**
Unsuitable extinguishing media:	**No information**

5. FIRE FIGHTING MEASURES

Specific hazards arising from the chemical:	**Toxic gas (sulfur oxide (SOx)) is generated in a fire.**
Special precautions for fire-fighters:	**Nothing particular**
Firefighters equipment:	**Firefighters should wear proper protective equipment.**

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	**Avoid raising dust during a process and recover it. Wear proper protective equipment and avoid contacting dust with eyes and skin and inhaling dust.**
Environmental precautions:	**Nothing particular**

7. HANDLING & STORAGE

Advice on safe handling:	**Wear a dust respirator, safety glasses and so one, as appropriate. Avoid collapse and dropping of the goods.**
Storage conditions:	**Store indoors, way from water.**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

ACGIH	**TWA**	**10 mg/m^3 (aluminum oxide)**
	TWA	**5 mg/m^3 (diiron trioxide)**
	TWA	**10 mg/m^3 (titan oxide)**
	TWA	**2 mg/m^3 (calcium oxide)**
	TWA	**0.025 mg/m^3 (quartz, cristobalite)**

Appropriate engineering controls:	**To keep below exposure limit, make available local exhaust ventilation if necessary.**

Individual protection measures:

Respiratory protection:	**When above exposure limit, use a dust respirator, if ventilation is judged to be insufficient.**
Hand protection:	**Wear protective gloves.**
Eye protection:	**Wear dust goggles, if necessary.**
Skin and body protection:	**Wear long sleeve clothes to protect skin.**
Hygiene measures:	**Wash hands after handling.**

9. PHYSICAL & CHEMICAL PROPERTIES

Physical form, color etc:	**Powder / White or light brown**
Odor:	**No odor**

9. PHYSICAL & CHEMICAL PROPERTIES

pH:	**No data, insoluble in water**
Melting point:	**No data**
Boiling point, Flash point, Auto-ignition point:	**Not flammable solids**
Specific gravity:	**No data**
Solubility:	**Sulfate is soluble in water**

10. STABILITY & REACTIVITY

Stability:	**Stable under normal conditions.**
Possibility of hazardous reactions:	**React with strong acids and hydrogen fluoride.**
Conditions to avoid:	**Nothing particular**
Material to avoid:	**Strong acids and hydrogen fluoride.**
Hazardous decomposition products:	**When heated it produces sulfur oxides (SOx)**

11. TOXICOLOGICAL INFORMATION

GHS classification was performed by the data of a pure substance, because tested data as a mixture is not available.
As reference, data of each ingredient are shown below.

Skin corrosion/Irritation:	**Corrosivity on skin , very irritating to damp skin, and UN classification class 8-III(Category 1C).(Calcium oxide)**
	Redness and moderate irritation on humans. (Category 2) (diiron trioxide)
Serious eye damage / eye irritation	**Corrosive to eye, and corrosion of the skin(Category 1C).(Calcium oxide)**
	Corrosive in humans. (Category 1) (diiron trioxide)
	Mild by rabbit test. (Category 2B) (titanium dioxide)
Carcinogenicity	**May cause cancer. IARC68: 1, NTP RoC: K, Japan Society for Occupational Health: 1. (Category 1A) (crystalline quartz)**
Specific target organs/systemic toxicity following single exposure	**Upper respiratory irritation (Category 3, respiratory tract irritation) (aluminum oxide)**
	Short-term exposure affects the respiratory system in humans in case of high inhalation concentration. (Category 1, respiratory system) (crystalline quartz)

11. TOXICOLOGICAL INFORMATION

	There is a statement that the inflammation of a respiratory tract (ACGIH (2001)) and pneumonitis (HSDB (2005)) are caused from dust inhalation and it was set as category 1 (respiratory systems), and if it drinks by mistake, a pulse will be quick and will become weak, breathing is quick and becomes shallow, body temperature falls, it becomes difficult to breathe by cancer of glottis, and will be in a shock states. There is the description which also produces esophageal, the stomach perforation (HSDB (2005)), but it was Priority2, it classified into Category 2 (whole body toxicity, digestive organ).(Calcium oxide) **The coughing and also closeness were seen in humans (Category 3) (diiron trioxide)** **Fume stimulates an respiratory tract (Category 3) (titanium dioxide)** **It is reported that exposure to sulfur particulates produces tracheobronchitis, characterized by cough, sore throat, and chest pain in humans (PATTY (5th, 2001)). Additionally, it is reported that acute effects of sulfur inhalation include catarrhal inflammation of nasal mucosa, which may lead to hyperplasia and tracheobronchitis is a frequent occurrence with dyspnea, persistent cough and expectoration which is sometimes streaked with blood (HSDB (2003)). Based on these information, the substance was classified into Category 1 (respiratory tract). As relevant information, dyspnea was observed by oral administration to rats at 1000 mg/kg and more (IUCLID (2000)).(sulfur)**
Specific target organs/systemic toxicity following repeated exposure	**By occupational exposure of aluminas, pulmonary fibrosis was occurred. (Category 1, lung) (aluminum oxide)** **Respiratory system and kidney are affected in humans. (Category 1, respiratory system and kidney) (crystalline quartz)** **It was classified into Category 1 (respiratory systems) according to the statement of ulcers and perforations of nasal septum (ACGIH (2001)), and (ICSC (1997)).(Calcium oxide)** **Although abnormalities are found on a chest x-rays test in humans, it is clinically satisfactory, and if it accumulates in lungs, it will become siderosis, but it is benign and does not progress to fibrosis. Metal fevers may be occurred by exposure.(Category 1, respiratory system) (diiron trioxide)** **Pneumoconiosis changes became clear by x-ray test, although not accompanied by change of the lung function of very few of the laborers with occupational exposure for 20 years or more. (Category 1, lung) (titanium dioxide)**

11. TOXICOLOGICAL INFORMATION

	It is reported that workers exposed to atmospheric sulphur for 2.0 - 2.5 years exhibited frequent nosebleeds, bronchitis and impaired lung function (IUCLID (2000)). Additionally, it is reported that mine workers exposed to sulfur dust and sulfur dioxide often had chronic sinus effects and respiratory disturbances. Based on this information found in a document in List 2, the substance was classified into Category 2 (respiratory system). There are reports that development of comedones was reported in some workers exposed to sulfur dust (IUCLID (2000)) and skin may be subject to erythematous and eczematous lesions and signs of ulceration in workers whose hands are in prolonged or repeated contact with powdered sulfur (HSDB (2003)). There is a report of an animal test where dermal application of 10% test substance to rabbits for 2 weeks resulted in hyperkeratosis and formation of comedones (IUCLID (2000)). Based on this information found in a document in List 2, the substance was classified into Category 2 (skin).(sulfur)
Aspiration hazard	**Category 1 because of "aspiration pneumonia to human beings."(HSDB, 2005)(Calcium oxide)**

12. ECOLOGICAL INFORMATION

Bio-accumulative potential (aqueous environmental hazard) (chronic):	**Relevant toxicity is not indicated in the water solubility, but being metal compound, its behavior in water is uncertain.(Category 4) (titanium dioxide)**

13. DISPOSAL CONSIDERATIONS

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Waste must be sent to an approved incinerator or disposed in an approved waste facility.

14. TRANSPORT INFORMATION

National regulations

Ground regulation information:	**Not regulated**
Maritime regulation information:	**Non-hazardous material**

Prevent exposure to water and collapse of cargo in freight transport.

United Nations number:	**-**
UN Proper shipping name:	**-**
Transport Hazard class:	**-**
Packing group, if applicable:	**-**
Marine pollutant (Y/N):	**Not applicable**

15. REGULATORY INFORMATION

International Inventories

EINECS/ELINCS Listed

TSCA Listed

Japanese regulations

ISHA: Chemical Substances requiring Labeling and Deliver of Documents, etc.

Water Pollution Control Law: Designated Substances, Aluminium and its compounds(Article 3-3-44 of Cabinet order)

16. OTHER INFORMATION

This information is based on our present state of knowledge and is intended to describe our products from the point of view of the safety requirements. It should not be construed as guaranteeing specific properties.

End of SDS