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|---|-----------------------------------|---------|---------------|-----|
|  | Material Safety Data Sheet | CAS No. | 7631-86-9 | |
| | | 제정일자 | 2005년 10월 01일 | |
| | Silicon Dioxide | 개정일자 | 2011년 01월 04일 | |
| | | 개정번호 | 5 | 1/8 |

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

- 1) Product Name: Silicon dioxide
- 2) Advisable use and Restriction
 - Filter acid, abrasive, ceramics, enamel, ferrosilicon, mold, Decolorant, Petroleum
- 3) Manufacturer/Supplier/Distributor information

Company : OCI Company LTD.(Gunsan Plant)

Address : 233 Soryong-dong, Gunsan, Jeollabuk-do, South Korea

Emergency response number : TEL: +82-63-460-6060

2. HAZARD IDENTIFICATION

- 1) Hazard classification : Not applicable
- 2) Allocation label elements
 - Symbol:
 - Not applicable
 - Signal word:
 - Not applicable
 - Hazard statements:
 - Not applicable
 - Precautionary statements:
 - Prevention : Not applicable
 - Response : Not applicable
 - Storage : Not applicable
 - Disposal : Not applicable
- 3) Other hazard information not included in hazard classification:
 - Not applicable

3. INGREDIENT INFORMATION

| Components | Common name | CAS NO | PCT(%) |
|---|---|-----------|--------|
| Synthetic Amorphous Silicon Dioxide, Crystalline-Free | Fumed Silica, Silic anhydride, Dioxosilane, | 7631-86-9 | 100 |

A4(210mm×297mm)

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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 2/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

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| | Cristobalite, Quartz, Infusorial earth, Sand | | |
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4. . FIRST AID MEASURES

1) Eye contact:

- Immediately flush eyes with plenty of water for at least 20 minutes.
- Get immediate medical attention.

2) Skin contact:

- Wash thoroughly with soap and water at least 20minutes.
- Immediately remove contaminated clothing and shoes.
- Launder and dry contaminated clothing and shoes thoroughly before reuse.
- Get immediate medical attention.

3) Inhalation:

- Move victim to fresh air.
- If not breathing, give artificial respiration.
- If breathing is difficult, give oxygen.
- Get immediate medical attention.

4) Ingestion:

- Never give anything to an unconscious person.
- Get immediate medical attention

5) Advice to physician:

- Give medical treatment suitable for symptoms.

5. FIRE FIGHTING MEASURES

1) Extinguishing media:

- Dry sand, dry chemical, soda ash or lime, water spray, regulatory foam, dioxide
- Do not use water as straight stream directly on spilled material.

2) Hazards from chemical product : (Ex: hazardous combustion products)

- May ignite on heat, sparks, and flame.
- Containers may explode if heated.
- May burn in fire but not ignite.
- May produce irritating, corrosive and toxic gases.
- Harmful if inhaled.
- Vapors may cause dizziness or asphyxiation without warning.

3) Protective clothing and fire fighting:

- Move containers from fire area if you can do it without risk.
- Avoid runoff into storm sewers and ditches which lead to waterways.

| | | | | | | |
|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 3/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

- In the event of fire, wear self-contained breathing apparatus.
- Keep out of waterways, sewer, basement and enclosed areas.
- Fire involving tanks do not approach fire area.
- Cool containers with flooding quantities of water until well after fire is out.

6. ACCIDENTAL RELEASE MEASURES

1) Health considerations and protective equipment:

- Remove all sources of ignition.
- Stop leak if you can do it without risk.
- Ensure adequate ventilation.
- Do not touch or walk through spilled material.
- Avoid dust formation.

2) Environmental considerations:

- Keep out of waterways, sewer, basement and enclosed areas.

3) Spill clean-up procedures:

- Clean up the area with water.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
- Cover powder spill with plastic sheet or tarp to minimize spreading.

7. HANDLING AND STORAGE

1) Handling:

- Incompatible materials should be isolated.
- Wash thoroughly after handling.
- Avoid high temperature.

2) Storage:

- Keep containers securely sealed.
- Store in cool, dry conditions place.
- Store away from incompatible materials and conditions.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Exposure limits value

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|------------|---------------------|-------|-------|------|
| Components | Regulatory in KOREA | ACGIH | NIOSH | OSHA |
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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 4/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

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| Silicon dioxide | No data | No data | 6 mg/m3 | 80 mg/m3 |
|-----------------|---------|---------|---------|----------|

2) Engineering controls : Indoor work place:

- Ensure adequate ventilation to maintain exposure below occupational limits.
- Provide appropriate exhaust ventilation at places where dust can be generated.

3) Personal protection:

○ Respiratory protection:

- Wear appropriate protective mask or chemical safety mask as described by KOSHA's..

○ Eye protection:

- Dust goggles should be worn when excessively.
- An eye wash unit and safety shower station should be available nearby working place.

○ Skin protection:

- Wearing chemically resistant safety gloves. (neoprene)

○ Body protection:

- Wearing chemically resistant safety clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--|
| 1) Appearance | Solid |
| 2) Odor | Odorless |
| 3) Threshold of odor | No data |
| 4) pH | 4 - 9 |
| 5) M.P/B.P | 1610 - 1710 °C (2930 - 3110 °F) |
| 6) Initial boiling point or range | 2230 °C (4046 °F) |
| 7) Flash point | No data |
| 8) Evaporation rate | No data |
| 9) Flammability (solids, gas) | Non-flammable |
| 10) Upper/lower flammability/explosive limit | No data |
| 11) Vapor pressure | 13.3 hPa (1732 °C) |
| 12) Solubility | Ca. 15 - 68 mg/l (20 °C, pH 5.5 - 6.6) |
| 13) Vapor density | No data |
| 14) Specific gravity | 2.2 g/cm ³ (20 °C) |
| 15) n-octanol/water partition coefficient | 0.53 |
| 16) Auto ignition temperature | No data |
| 17) Degradation temperature | No data |

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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 5/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

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| 18) Viscosity | No data |
| 19) M.W | 60.09 |

10. STABILITY AND REACTIVITY

가. STABILITY AND REACTIVITY:

- Stable at normal temperatures and pressures.

나. Hazardous reactivity:

- Keep away from heat and sources of ignition.
- Avoid dust formation.

다. Incompatibility:

- No data

라. Hazardous decomposition products:

- No data

11. TOXICOLOGICAL INFORMATION

1) Exposure route information

- No data

2) Acute and chronic effects by short term or long term exposure

○ Acute toxicity:

- Oral: LD50>5110mg/kg(Rat)
- Eye/Skin: LD50>2000mg/kg(Rabbit)
- Inhalation: LD50>2.08mg/L(Rat)

○ Skin corrosion/ irritation:

- Not irritating to skin. (Rabbit)

○ Serious eye damage/ eye irritation:

- Not irritating to eyes. (Rabbit)

○ Respiratory sensitization:

- No data

○ Skin sensitization:

- There is no evidence of skin sensitization.

○ Carcinogenicity:

- IARC Group 3

○ Germ cell mutagenicity:

- There is no evidence that SAS induce mutations/genotoxic either in vitro or in vivo in standard methods.

○ Reproductive toxicity:

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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 6/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

- The study on rats and mice gave no evidence of adverse effects on reproduction and development.
- Specific target organ toxicity (single exposure):
 - No clinical symptoms (Rat, inhalation)
- Specific target organ toxicity (repeated exposure):
 - The inhalation of respirable particles of SAS produces a time and dose related inflammation response of the lung tissue in animal studies. All these effects were reversible following discontinuation of exposure.
- Aspiration hazard:
 - No data

12. ECOLOGICAL INFORMATION

- Aquatic/terrestrial toxicity:
 - EC50: >10,000mg/L (Daphnia magna, 48hr)
- Persistence and biodegradation:
 - ogKow: 0.53(Estimated)
- Bioaccumulation:
 - BCF: 3.162(Estimated)
- Mobility in soil:
 - Koc: 2.881(Estimated)
- Other hazardous information:
 - No data

13. DISPOSAL CONSIDERATIONS

- 1) Disposal:
 - Dispose of contents/container to Wastes Control Act in Korea.
- 2) Precaution:
 - Waste generators must consult state and local hazardous waste regulations to ensure.

14. TRANSPORT INFORMATION

- 1) UN No: Not applicable
- 2) Proper shipping name: Not applicable
- 3) Class or division: Not applicable
- 4) Packing group: Not applicable
- 5) Marine pollutant : Not listed

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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 7/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

6) Special safety response for transportation or transportation measure: Not applicable

15. REGULATORY INFORMATION

- 1) Korea occupational safety and health regulation in Korea: Not listed
- 2) Hazardous chemical management regulation in Korea: Not listed
- 3) Hazardous chemical safety management regulation in Korea: Not listed
- 4) Waste management regulation in Korea : Not listed
- 5) Other in KOREA and except KOREA regulation:
 - KOREA regulation:
 - Persistent organic. pollutants management regulation: Not listed
 - Abroad regulation:
 - U.S.A.
 - U.S.A. management information(OSHA regulation): Not listed
 - U.S.A. management information(CERCLA regulation): Not listed
 - U.S.A. management information(EPCRA 302 regulation): Not listed
 - U.S.A. management information(EPCRA 304 regulation): Not listed
 - U.S.A. management information(EPCRA 313 regulation): Not listed
 - U.S.A. management information(Rotterdam Convention on Substances): Not listed
 - U.S.A. management information(Stockholm Convention on Substances): Not listed
 - U.S.A. management information(Mont- real Protocol on Substances): Not listed
 - EU
 - EU CLASSIFICATION (CLASSIFICATION): Not listed (EU CLP)
 - EU CLASSIFICATION (RISK PHRASES): Not listed (EU CLP)
 - EU CLASSIFICATION (SAFETY PHRASE): Not listed (EU CLP)

16. OTHER INFORMATION

- 1) REFERENCES:
 - References
 - KOSHANET MSDS
 - IUCLID
 - OECD SIDS
 - ECOTOX
 - NITE
 - Recommendations on the transport of dangerous goods
 - NCIS
 - Emergency response guide book

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|-------------|------------------------|---------|-----------|------|---|-----|
| MSDS | Silicon Dioxide | CAS No. | 7631-86-9 | 개정번호 | 5 | 8/8 |
|-------------|------------------------|---------|-----------|------|---|-----|

- ECOSAR
 - QSAR
 - EU RAR
 - The chemical database
 - TCCA DB
 - HSDB
 - IARC
 - ICSC
 - NIOSH Pocket guide
 - RTECS
 - NITE 일본 GHS 분류결과
 - CCRIS
 - GENETOX
 - The Chemical Database
- 2) Prepare date: 2005. 10. 01
- 3) Revised date: 2011. 01. 04

