SAFETY DATA SHEET

No.CRX-001-900-E

1. The Chemical Substance and Company Information

Names of chemical substance

Product name: CHROMATOREX
Grade: 12,923AR,MB,SMB,FL,SPS,PSQ,BW,GS,B series

Company’s name: Fuji Silysia Chemical Ltd.
Address: 2-1846 Kozoji-cho, Kasugai, Aichi, 487-0013 Japan
Telephone No.: +81-568-51-2511
Contact Department: Quality Assurance Department
Urgent Telephone No.: +81-568-51-2511 (08:30 ~ 17:45 Business day)
Fax No.: +81-568-51-8557
Mail address: QAG@fuji-silysia.co.jp

Recommended use and restriction of use

Recommended use: Packing media for liquid chromatography

Limitation of usage

2. Hazards identification

GHS classification

Physicochemical hazards

Flammable solids: out of classification
Pyrophoric solids: out of classification
Self-heating substances and mixtures: out of classification
Substances and mixtures which, in contact with water, emit flammable gases: out of classification

Health hazards

Acute toxicity - oral: out of classification
Acute toxicity - dermal: out of classification
Skin corrosive / irritation: out of classification
Serious Eye Damage/Eye Irritation: category 2B
Specific target organ systemic toxicity - single exposure: category 3
Hazardous to the aquatic environment: out of classification
(Respiratory tract irritation)
Environmental hazards

The items without description are out of classification or cannot be classified.

Label elements

Pictogram or symbol

![Warning symbol]

Signal Word

Warning

Hazard statement

Eye irritation

May cause respiratory irritation

Precautionary statement

【Precaution】

Wash hands thoroughly after handling.
Avoid breathing dust/fumes/gas/mist/vapours/spray.
Use only outdoors or in a well-ventilated area.

【Correspondence】

If in eyes:
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.

If inhaled:
Remove person to fresh air and keep comfortable for breathing. Gall a doctor if you feel unwell

【Storage】

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

【Disposal】

Dispose of contents/container has to be carried out in accordance with local/regional/national/international regulation.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical substance or mixture</th>
<th>Chemical substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name or generic name</td>
<td>Amorphous silicon dioxide</td>
</tr>
<tr>
<td>Alias</td>
<td>Silica gel, Non-crystalline silica</td>
</tr>
<tr>
<td>Chemical formula</td>
<td>SiO$_2$·nH$_2$O</td>
</tr>
<tr>
<td>CAS registered No.</td>
<td>112926-00-8 Non-crystalline silica(Silica gel)</td>
</tr>
<tr>
<td></td>
<td>7631-86-9 Silica</td>
</tr>
<tr>
<td></td>
<td>(Silicon dioxide including crystalline and amorphous)</td>
</tr>
<tr>
<td>Official gazette No. Chemical</td>
<td>(1)-548</td>
</tr>
<tr>
<td>Labour</td>
<td>Existing</td>
</tr>
<tr>
<td>A purity or a range</td>
<td>100%</td>
</tr>
</tbody>
</table>
4. First Aid Measure

IF INHALED  Not specific first-aid is necessary.  Get medical advice/attention if you feel unwell.

IF ON SKIN   Not specific first-aid is necessary.  If skin irritation or rash occurs, get medical advice/attention.

IF IN EYES   Do not rub eyes.  Rinse cautiously with water for several minutes.  Remove contact lenses, if present and easy to do.  Continue rinsing.  If eye irritation persists, get medical advice/attention.

IF SWALLOWED Vomit up and rinse mouth with clean water well.  Get medical advice/attention if you feel unwell.

5. Fire Fighting Measure

Extinguish  This material is not combustible.  Use extinguish agents appropriate for surrounding fire.

Special hazards
Special fire extinguishing method
Protection of a person to extinguish a fire  Wear respiratory protection or chemical protective clothing for surrounding fire.

6. Accidental Release Measure

Instructions for the human body.
Protective equipment and emergency step
Large spill:  Isolate hazard area and deny entry to unnecessary personnel.  Wear appropriate protection to avoid contact/inhalation to eyes and skin.  (ref. “8. Exposure Control/ Personal Protection “)

Instructions for the environment  Do not discharge it to environment.

Collection, neutralization  Vacuum spillage and into an empty container and dispose them later as an industrial waste.
Preventive measures against second disaster
Residue on the floor may cause slip, clean up diligently.

7. Handling and Storage

Handling
- Technical measures: Do the equipment measures in the “8. Exposure Control/Personal Protection”, and wear the protection.
- Local / general ventilation: Do the local and general ventilation in the “8. Exposure Control/Personal Protection”.
- Safe handling instructions: Take precautionary measures against static discharge. Do not contact, inhale or swallow. Perform ventilation for exhaust to keep the atmospheric concentration lower than exposure limit. Wash thoroughly after handling.
- Contact evasion: Refer to the “10. Stability and reactivity”.

Storage
- Technical Measures: Install lighting and ventilation to store and handle.
- Composite hazard substance: Refer to the “10. Stability and reactivity”.
- Storage condition: Store in a cool/well-ventilated place to protect from sunlight and rainwater.
- Container and packaging materials: Store it in tightly closed container which is not breakable.

8. Exposure Control/ Personal Protection

Standard control concentration: No setting
Permissible concentration: (an exposure limit value/ a biological exposure index)

Japan Society of Occupational Health (2015) The 3rd dust(Lime or other inorganic or organic)
- Total dust: 8 mg/m$^3$
- Inhalation-related dust: 2 mg/m$^3$

ACGIH(2013) Particles (insoluble or poorly soluble)
- TLV-TWA: Respirable particles: 3 mg/m3
- Inhalable particles: 10 mg/m3
(Silica, amorphous withdrawn in 2006)
Equipment measure
Install washing eyes device in a workplace to store this material or handle it.
Install a ventilating device to keep an air pollutant less than permissible concentration when dust occurs by a process.

Protective equipment
Protection for respiratory
Wear appropriate and authorized respiratory protection.
Protection for hands
Wear appropriate protective gloves such as rubber, which do not transmit powder.
Protection for eyes
Use personal eye protection.
Protection for skin and body
Use the appropriate protection suit and mask.

Hygiene measure
Wash hands thoroughly after handling.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state/Shape/Color</td>
<td>Solid, Granular or spherical, White</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH</td>
<td>4 ~ 9 (5% slurry)</td>
</tr>
<tr>
<td>Melting point</td>
<td>&gt;1600 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>2230 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>Non-flammable</td>
</tr>
<tr>
<td>Pyrophoric temperature</td>
<td>Non-flammable</td>
</tr>
<tr>
<td>Explosion range</td>
<td>None</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>10mmHg (1732 °C)</td>
</tr>
<tr>
<td>[Conversion value 1333Pa (1732 °C)]</td>
<td></td>
</tr>
<tr>
<td>Vapor density (Air =1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>True specific gravity 2.2</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble in water</td>
</tr>
<tr>
<td>Octanol / water distributed</td>
<td>Not available</td>
</tr>
<tr>
<td>coefficient</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

Stability
Stable under ordinary conditions of use (ambient temperature)

Hazard reaction possibility
On reacting with hydrogen fluoride, forms toxic silicon fluoride (gas). Dissolved in strong base.

Condition to avoid
Contact with composite hazard substance
Split powder. Handling near flammable substance without anti-spark precaution.
Composite hazard substance Hydrogen fluoride, strong base
Hazard resolution substance No information

11. Toxicological Information
Below information has been summarized from NITE CHRIP Data Base GHS classification by related Govt Orgs for "Amorphous Silica(Silica gels, Precipitated silica)" issued by Ministry of Health, Labour and Welfare/Ministry of Environment of Japan(2015).

Acute Toxicity

Oral

Out of classification
Rat LD50 > 5000mg/kg(Precipitated silica) and > 5110mg/kg (precipitated silica) SIDS(2006), ECETOC JACC(2006)
Mice LD50>5g/kg FAO/WHO Toxicological Evaluation of Food Additives

Dermal

Out of classification
Rabbit LD50>2000mg/kg (Silica gels) and >5000mg/kg(Silica gels) SIDS(2006),ECETOC JACC(2006)

Inhalation

Cannot be classified due to insufficient data
Rat LC50(4hrs) 0.691mg/l(Precipitated silica) ECETOC JACC(2006) and 2.08mg/L(Amorphous silica) SIDS(2006)
The standard for dust, mist applied as the material is solid.

Skin corrosion / irritation

Out of classification
OECD TG 404 · Rabbit not irritating(Precipitated silica) SIDS(2006), ECETOC JACC(2006)
Rabbit not irritating(Precipitated silica, 24hrs) SIDS(2006), ECETOC JACC(2006)
Rabbit not irritating(Silica gels, 24hrs) SIDS(2006).

Serious eye damage / irritation

Classified : Category  2B
OECD TG 404 · Rabbit : Slight red conjunctiva observed, but indicated recovery(Precipitated silica) SIDS(2006),
Rabbit · Plural reports of not irritating, or slight conjunctiva and recovery SIDS(2006)

Respiratory / skin sensitizer

Cannot be classified due to insufficient data.
Germ cell mutagenicity

Cannot be classified due to the change of standard of guidance

In vivo, by oral, inhalation dose on Rat, negative in lethal test, gene mutation test and heterosome test (SIDS 2006).

In vitro, negative by recovery genemutation test on bacteria, gene mutation and heterosome test on cultivating cells of Mammalia.

Vague result by ames test on cultivating cells of Mammalia (SIDS 2006).

Silicon dioxide: Negative in rat lung germinal cells after long-term inhalation exposure (OECD SIDS).

: Negative in vivo micronucleus test using bone marrow of mice (JJFC 2003)

Carcinogenicity

Cannot be classified

The material classified as synthetic amorphous silica (IARC 68 1997). No information caused carcinogenicity on human by exposure, however, IARC described as insufficient evidence on human against entire amorphous silica (additionally include silica fiber derived from diatomatious earth, originated creatures. On animal test, also described as insufficient evidence against synthetic amorphous silica. In the results, entire amorphous silica classified as category 3. Regarding information on carcinogenicity of amorphous silica and human exposure, there was no relationship on occurrence of silicosis and exposure of amorphous silica fiber of creature origin, on the 3 regionals investigation of exposure (IARC 68 1997). Carcinogenicity of oral dosage of Silica gels (synthetic amorphous silica) against Rat and mouse for 2 years by feeding at up to 50,000 ppm mixture, no tumor or non-tumor change observed on major organs (ECETOC JACC 2006, IARC 68 1997).

Not classified in the list of of 1st or 2nd substances by Japan Society of Occupational Health.

Toxic to reproduction toxicity

Cannot be classified

No information on human. For animal test, female rat, mouse, hamster and rabbit at the dosage of 1,340~1,600mg/kg/day forced oral exposure, no toxic on the female, embryos, neither deformation (ECETOC JACC 2006).
Specific target organ systemic toxicity (single exposure)

Classified: Category 3 (Respiratory tract irritation)

Tract irritation reported (Silica gels) SIDS (2006), ECETOC JACC (2006)

Specific target organ systemic toxicity (repeated exposure)

On human, workers exposed for 8 and half years (average) by the material, no toxic influence observed lung function and inspection on chest by X-ray (ACGIH 7th, 2001, ECETOC JACC 2006, SIDS 2006, DFGOT vol.2 1991).

Exposure test by animals at concentration of 126mg/m³, rat for 1 year and guinea pig, rabbit for 2 years, no pulmonary fibrosis observed, limited to accumulation of macrophage and slight increase of reticulum (ACGIH 7th 2001).

No toxicity observed by oral fed of mixture, mouse for 24 months and rat for 21 months (ECETOC JACC 2006).

Lung monocyte and reticular fiber increased at inhalation exposure of 15mg/m³ for 12~18 months by monkey, rat and guinea pig (DFGOT vol.2 1991) No influence against human. The slight influence at inhalation route and no influence by oral dosage for animals. Thus, categorized as cannot be classified.

Silicon dioxide: No influence to lung tissue after recoverable inflammation observed in toxic test of repeated exposure for inhalation particles. In long term oral dosage, no pathological and histological observations reported (OECD SIDS).

Toxicity of respiratory by inhalation

Cannot be classified due to insufficient data

12. Environmental influence information

Hazardous to the aquatic environment: acute hazard

Out of classification

Daphnia magna: 24 hrs. EC > 10,000mg/l, zebrafish 96hrs LC50 = 10000mg/l
Hazardous to the aquatic environment - chronic hazard No data

Persistence/ Decomposition Silicon dioxide exists universally in the soil as inorganic ingredient. The silicon dioxide discharged into environment to be merged into the earth, soil and cannot be distinguished its behavior.

Bioaccumulation Silicon dioxide universally exists in water as silicic acid, and accumulated as useful ingredient for certain creatures such as Diatomaceae, Radiolana and Porifera for their skeletons, Poaceae for improving its durability.

Migration in the soil The silicon dioxide discharged into environment to be merged into the earth, soil and cannot be distinguished its behavior.

Hazardous to the Ozone Layer Not contains any substances listed by Montreal Protocol

13. Disposal Considerations
Leftover waste The disposal of the leftover waste has to be carried out in accordance with the legal requirements.

A pollution container and packing
Clean a container and recycle it, or appropriate disposal must be made according to official regulations. When an empty container is disposed, completely remove contents.

14. Transportation Information
International regulation
UN number: Not applicable
UN name for transportation: Not applicable
UN Classification: Not applicable

Marine regulatory information Non-hazardous chemical
Air regulatory information Non-hazardous chemical
Land regulatory information Non-hazardous chemical

Special safety measures On the occasion of the transportation, load it to avoid direct rays of the sun, the damage of a container, corrosion and leaking, and be surely prevention of collapse of cargo. Do not pile the heavy goods up on the top.
15. Regulatory Information

   Labour Law for Safety & Health of Japan  Not applicable
   Pollutant Release and Transfer Register Law  Not applicable
   Poisonous and Deleterious Substances Control Law  Not applicable

16. Other Information

   Export Control Act of Japan  Appendix 1 Item 16 Part 6 Group 28 Inorganic Chemical Products
   Applicable for "Catch-All" restriction

References

   Chemical Handbook Basic
   IUCLID Dataset (2000)
   FAO/WHO Toxicological Evaluation of Certain Food Additives With a Review of General Principles and Specifications
   OECD SIDS Profile for Initial Assessment Report
   JJFC Vol.10(3) 2003
   IARC "Agents Classified by the IARC Monographs" (October 2013)
   2013 TLVs and BELs (ACGIH)
   NITE CHRIP Data Base
   GHS Classification Guidance of Enterprises
   by Ministry of Economy, Trade and Industry of Japan (Rev.ver.1.1,2013)

A disaster example

   No information available

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