1. Identification

1.1 GHS Product identifier

Product name: CFS-104, Tetraethyl orthosilicate

1.2 Other means of identification

Product number: CFS-104
Other names: ethyl orthosilicate; Silicic acid (H4SiO4), tetraethyl ester; TEOS

1.3 Recommended use of the chemical and restrictions on use

Identified uses: Only for Industrial Use
Uses advised against: no data available

1.4 Supplier's details

Company: Hubei Co-Formula Material Tech Co.,Ltd.
Address: C1420-1421, Longyang Avenue, Wuhan 430056, Hubei, China
Telephone: +86-27-84459282
Fax: +86-27-84459282

1.5 Emergency phone number

Emergency phone number: +86-27-84459282
Service hours: Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

2. Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 3
Eye irritation, Category 2
Acute toxicity - Inhalation, Category 4
Specific target organ toxicity – single exposure, Category 3

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word: Warning
Hazard statement(s): H226 Flammable liquid and vapour
H319 Causes serious eye irritation
H332 Harmful if inhaled
H335 May cause respiratory irritation

Precautionary statement(s)

Prevention: P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
2.3 Other hazards which do not result in classification

no data available

3. Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common names and synonyms</th>
<th>CAS number</th>
<th>EC number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethyl orthosilicate</td>
<td>Tetraethyl orthosilicate</td>
<td>78-10-4</td>
<td>201-083-8</td>
<td>&gt; 99%</td>
</tr>
</tbody>
</table>

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice
Medical attention is required. Consult a doctor. Show this safety data sheet (SDS) to the doctor in attendance.

If inhaled
Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact
Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact
Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion
Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed
4.3 Indication of immediate medical attention and special treatment needed, if necessary

no data available

5. Fire-fighting measures
5.1 Extinguishing media

Suitable extinguishing media
Use dry chemical, carbon dioxide or alcohol-resistant foam.

5.2 Specific hazards arising from the chemical

no data available

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures
6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

7. Handling and storage
7.1 Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

8. Exposure controls/personal protection
8.1 Control parameters

Occupational Exposure limit values

<table>
<thead>
<tr>
<th>Component</th>
<th>Tetraethyl orthosilicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS No.</td>
<td>78-10-4</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Limit value - Eight hours</td>
<td>Limit value - Short term</td>
</tr>
<tr>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
</tr>
<tr>
<td>Austria</td>
<td>20</td>
</tr>
<tr>
<td>Belgium</td>
<td>10</td>
</tr>
<tr>
<td>Component</td>
<td>Tetraethyl orthosilicate</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>CAS No.</td>
<td>78-10-4</td>
</tr>
<tr>
<td>Canada - Ontario</td>
<td>10</td>
</tr>
<tr>
<td>Canada - Québec</td>
<td>10 85</td>
</tr>
<tr>
<td>Denmark</td>
<td>10 85 20 170</td>
</tr>
<tr>
<td>European Union</td>
<td>5 44</td>
</tr>
<tr>
<td>Finland</td>
<td>10 86 20 (1) 170 (1)</td>
</tr>
<tr>
<td>France</td>
<td>10 85</td>
</tr>
<tr>
<td>Germany (AGS)</td>
<td>1,4 12 1,4 (1) 12 (1)</td>
</tr>
<tr>
<td>Germany (DFG)</td>
<td>10 86 10 86</td>
</tr>
<tr>
<td>Ireland</td>
<td>10 85 30 (1) 255 (1)</td>
</tr>
<tr>
<td>Japan - JSOH</td>
<td>10 85</td>
</tr>
<tr>
<td>New Zealand</td>
<td>10 85</td>
</tr>
<tr>
<td>Poland</td>
<td>10 80</td>
</tr>
<tr>
<td>Singapore</td>
<td>10 85</td>
</tr>
<tr>
<td>South Korea</td>
<td>10 85</td>
</tr>
<tr>
<td>Spain</td>
<td>10 87</td>
</tr>
<tr>
<td>Switzerland</td>
<td>10 85 10 85</td>
</tr>
<tr>
<td>USA - NIOSH</td>
<td>10 85</td>
</tr>
<tr>
<td>USA - OSHA</td>
<td>100 850</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>[10] [87] [30] [260]</td>
</tr>
</tbody>
</table>

**Remarks**
- Finland (1) 15 minutes average value
- Germany (AGS) (1) 15 minutes average value
- Germany (DFG) STV 15 minutes average value
- Ireland (1) 15 minutes reference period
- United Kingdom The UK Advisory Committee on Toxic Substances has expressed concern that, for the OELs shown in parentheses, health may not be adequately protected because of doubts that the limit was not soundly-based. These OELs were included in the published UK 2002 list and its 2003 supplement, but are omitted from the published 2005 list.

### 8.2 Appropriate engineering controls
Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### 8.3 Individual protection measures, such as personal protective equipment (PPE)
**Eye/face protection**
9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odour</td>
<td>no data available</td>
</tr>
<tr>
<td>Melting point/ freezing point</td>
<td>138°C(lit.)</td>
</tr>
<tr>
<td>Boiling point or initial boiling point and boiling range</td>
<td>168°C(lit.)</td>
</tr>
<tr>
<td>Flammability</td>
<td>no data available</td>
</tr>
<tr>
<td>Lower and upper explosion limit / flammability limit</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>45°C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Decomposition temperature pH</td>
<td>no data available</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>no data available</td>
</tr>
<tr>
<td>Solubility</td>
<td>In water: Hydrolysis</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt;1 mm Hg (20 °C)</td>
</tr>
<tr>
<td>Density and/or relative density</td>
<td>0.933g/mL at 20°C(lit.)</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>7.2 (vs air)</td>
</tr>
<tr>
<td>Particle characteristics</td>
<td>no data available</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

no data available

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

no data available
11. **Toxicological information**

   **Acute toxicity**
   - Oral: no data available
   - Inhalation: no data available
   - Dermal: no data available

   **Skin corrosion/irritation**
   no data available

   **Serious eye damage/irritation**
   no data available

   **Respiratory or skin sensitization**
   no data available

   **Germ cell mutagenicity**
   no data available

   **Carcinogenicity**
   no data available

   **Reproductive toxicity**
   no data available

   **STOT-single exposure**
   no data available

   **STOT-repeated exposure**
   no data available

   **Aspiration hazard**
   no data available

12. **Ecological information**

12.1 **Toxicity**
   - Toxicity to fish: no data available
   - Toxicity to daphnia and other aquatic invertebrates: no data available
   - Toxicity to algae: no data available
   - Toxicity to microorganisms: no data available

12.2 **Persistence and degradability**
   no data available

12.3 **Bioaccumulative potential**
   no data available

12.4 **Mobility in soil**
   no data available

12.5 **Other adverse effects**
   no data available

13. **Disposal considerations**

13.1 **Disposal methods**

   **Product**
The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

**Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

### 14. Transport information

#### 14.1 UN Number

| ADR/RID: UN1292 | IMDG: UN1292 | IATA: UN1292 |

#### 14.2 UN Proper Shipping Name

| ADR/RID: TETRAETHYL SILICATE | IMDG: TETRAETHYL SILICATE | IATA: TETRAETHYL SILICATE |

#### 14.3 Transport hazard class(es)

| ADR/RID: 3 | IMDG: 3 | IATA: 3 |

#### 14.4 Packing group, if applicable

| ADR/RID: III | IMDG: III | IATA: III |

#### 14.5 Environmental hazards

| ADR/RID: No | IMDG: No | IATA: No |

#### 14.6 Special precautions for user

no data available

#### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

### 15. Regulatory information

#### 15.1 Safety, health and environmental regulations specific for the product in question

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common names and synonyms</th>
<th>CAS number</th>
<th>EC number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethyl orthosilicate</td>
<td>Tetraethyl orthosilicate</td>
<td>78-10-4</td>
<td>201-083-8</td>
</tr>
</tbody>
</table>

**European Inventory of Existing Commercial Chemical Substances (EINECS)**

Not Listed.

**EC Inventory**

Not Listed.

**United States Toxic Substances Control Act (TSCA) Inventory**

Not Listed.

**China Catalog of Hazardous chemicals 2015**

Not Listed.

**New Zealand Inventory of Chemicals (NZIoC)**

Not Listed.

**Philippines Inventory of Chemicals and Chemical Substances (PICCS)**

Not Listed.

**Vietnam National Chemical Inventory**

Not Listed.

**Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)**

Not Listed.

### 16. Other information

**Information on revision**
Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.