Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Code  SAC008
Product Name  Titanium and Titanium Alloys
Synonyms  All Titanium Base Alloys (Product #833)

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use  Alloy product manufacture
Uses advised against

1.3. Details of the supplier of the safety data sheet

Manufacturer Address  ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA

1.4. Emergency telephone number

Emergency Telephone  Chemtrec: +1-703-741-5970

Section 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
Regulation (EC) No 1272/2008

2.2. Label elements

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Physical state</th>
<th>Odour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various massive product forms</td>
<td>Solid</td>
<td>Odourless</td>
</tr>
</tbody>
</table>

2.3 Hazards not otherwise classified (HNOC)

Not applicable

Other Information
When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated:
- Titanium dioxide, an IARC Group 2B carcinogen.
- Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer.
- Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system.
- Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.
Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms

All Titanium Base Alloys, (Product #833).

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EC No</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>231-142-3</td>
<td>7440-32-6</td>
<td>50-&gt;99</td>
</tr>
<tr>
<td>Vanadium</td>
<td>231-171-1</td>
<td>7440-62-2</td>
<td>0-45</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>231-107-2</td>
<td>7439-98-7</td>
<td>0-37</td>
</tr>
<tr>
<td>Zirconium</td>
<td>231-176-9</td>
<td>7440-67-7</td>
<td>0-35</td>
</tr>
<tr>
<td>Chromium</td>
<td>231-157-5</td>
<td>7440-47-3</td>
<td>0-18</td>
</tr>
<tr>
<td>Niobium</td>
<td>231-113-5</td>
<td>7440-03-1</td>
<td>0-15</td>
</tr>
<tr>
<td>Tin</td>
<td>231-141-8</td>
<td>7440-31-5</td>
<td>0-8</td>
</tr>
<tr>
<td>Aluminium</td>
<td>231-072-3</td>
<td>7429-90-5</td>
<td>0-8</td>
</tr>
<tr>
<td>Silicon</td>
<td>231-130-8</td>
<td>7440-21-3</td>
<td>0-3</td>
</tr>
</tbody>
</table>

Section 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation
If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove to fresh air and consult a qualified health professional.

Skin Contact
None under normal use conditions.

Eye contact
In the case of particles coming in contact with eyes during processing, treat as with any foreign object.

Ingestion
Not an expected route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms
None anticipated.

4.3. Indication of any immediate medical attention and special treatment needed

Note to doctors
Treat symptomatically.

Section 5: FIRE FIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media
None in massive form, flammable as finely divided particles. Smother with salt (NaCl) or class D dry powder fire extinguisher.

Unsuitable extinguishing media
Do not spray water on burning metal as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material.

5.2. Special hazards arising from the substance or mixture

Intense heat. Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. WARNING: Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard.

Hazardous combustion products
Titanium dioxide, an IARC Group 2B carcinogen. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V2O5) affects eyes, skin,
respiratory system. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions
Use personal protective equipment as required.

For emergency responders
Use personal protective equipment as required.

6.2. Environmental precautions

Not applicable to massive product.

6.3. Methods and material for containment and cleaning up

Methods for containment
Not applicable to massive product.

Methods for cleaning up
Not applicable to massive product.

6.4. Reference to other sections

See Section 12: ECOLOGICAL INFORMATION.

Section 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Advice on safe handling
Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. WARNING: Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard.

General Hygiene Considerations
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Conditions
Keep chips, turnings, dust, and other small particles away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

Incompatible materials
Dissolves in hydrofluoric acid, Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

7.3. Specific end use(s)

Risk Management Methods (RMM)
Not required.
8.1. Control parameters

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>European Union</th>
<th>United Kingdom</th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Skin</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>7439-98-7</td>
<td>-</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 3 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Zirconium</td>
<td>7440-67-7</td>
<td>TWA: 5 mg/m³</td>
<td>-</td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 1 mg/m³</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>TWA: 2 mg/m³</td>
<td>STEL: 1.5 mg/m³</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 2 mg/m³</td>
</tr>
<tr>
<td>Niobium</td>
<td>7440-03-1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tin</td>
<td>7440-31-5</td>
<td>TWA 2 mg/m³ as Sn</td>
<td>TWA: 2 mg/m³</td>
<td>-</td>
<td>TWA: 2 mg/m³</td>
</tr>
<tr>
<td>Aluminium</td>
<td>7429-90-5</td>
<td>-</td>
<td>STEL: 30 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>-</td>
<td>STEL: 30 ppm</td>
<td>TWA: 10 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Italy</td>
<td>Portugal</td>
<td>Netherlands</td>
<td>Finland</td>
<td>Denmark</td>
</tr>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>7439-98-7</td>
<td>-</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 3 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Zirconium</td>
<td>7440-67-7</td>
<td>STEL: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 1 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
</tr>
<tr>
<td>Niobium</td>
<td>7440-03-1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Tin</td>
<td>7440-31-5</td>
<td>-</td>
<td>TWA: 2 mg/m³</td>
<td>-</td>
<td>TWA: 2 mg/m³</td>
</tr>
<tr>
<td>Aluminium</td>
<td>7429-90-5</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 0.05 mg/m³</td>
<td>TWA: 1.5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>TWA: 10 mg/m³</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Austria</td>
<td>Switzerland</td>
<td>Poland</td>
<td>Norway</td>
<td>Ireland</td>
</tr>
<tr>
<td>Titanium</td>
<td>7440-32-6</td>
<td>-</td>
<td>STEL: 1 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.2 mg/m³</td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>STEL 1 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>Ceiling: 0.05 mg/m³</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>7439-98-7</td>
<td>STEL 20 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 4 mg/m³</td>
<td>-</td>
</tr>
<tr>
<td>Zirconium</td>
<td>7440-67-7</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Chromium</td>
<td>7440-47-3</td>
<td>TWA: 2 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 0.5 mg/m³</td>
<td>TWA: 1.5 mg/m³</td>
</tr>
<tr>
<td>Niobium</td>
<td>7440-03-1</td>
<td>STEL 10 mg/m³</td>
<td>STEL 1 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>STEL: 0.6 mg/m³</td>
</tr>
<tr>
<td>Tin</td>
<td>7440-31-5</td>
<td>STEL 4 mg/m³</td>
<td>Skin</td>
<td>STEL: 4 mg/m³</td>
<td>TWA: 2 mg/m³</td>
</tr>
<tr>
<td>Aluminium</td>
<td>7429-90-5</td>
<td>STEL 20 mg/m³</td>
<td>TWA: 3 mg/m³</td>
<td>TWA: 2.5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
</tr>
<tr>
<td>Silicon</td>
<td>7440-21-3</td>
<td>TWA: 3 mg/m³</td>
<td>-</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
</tr>
</tbody>
</table>
Derived No Effect Level (DNEL) No DNELs are available for this product as a whole.

Predicted No Effect Concentration (PNEC) No PNECs are available for this product as a whole.

8.2. Exposure controls

Engineering Controls Avoid generation of uncontrolled particles.

Personal protective equipment

Eye/face protection When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.

Skin and body protection Wear fire/flame resistant/retardant clothing. Cut-resistant gloves and/or protective clothing may be appropriate when sharp surfaces are present.

Respiratory protection When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminate concentrations. Respiratory protection must be provided in accordance with current local regulations.

Environmental exposure controls Section 6: ACCIDENTAL RELEASE MEASURES.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Solid</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Various massive product forms</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>grey Silver</td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>Odourless</td>
<td></td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>1850 °C / 3370 °F</td>
<td></td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>-</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>-</td>
<td>None in massive form, flammable as finely divided particles</td>
</tr>
</tbody>
</table>

Flammability Limit in Air

Upper flammability limit: -
Lower flammability limit: -

Vapour pressure - Not applicable
Vapour density - Not applicable
Specific Gravity 6.49
Water solubility Insoluble
Solubility(ies) Not applicable
Partition coefficient - Not applicable
Autoignition temperature - Not applicable
Decomposition temperature - Not applicable
Kinematic viscosity - Not applicable
Dynamic viscosity - Not applicable
Explosive properties Not applicable
Oxidising properties Not applicable

9.2. Other information

Softening point -
Molecular weight -
VOC Content (%) Not applicable
Density -
Bulk density -
Section 10: STABILITY AND REACTIVITY

10.1. Reactivity
Not applicable.

10.2. Chemical stability
Stable under normal conditions.

- Explosion data
  Sensitivity to Mechanical Impact: None.
  Sensitivity to Static Discharge: None.

10.3. Possibility of hazardous reactions

Hazardous polymerisation
Hazardous polymerisation does not occur.

Possibility of Hazardous Reactions
None under normal processing.

10.4. Conditions to avoid
Dust formation and dust accumulation.

10.5. Incompatible materials
Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following: Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

10.6. Hazardous decomposition products
When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated: Titanium dioxide, an IARC Group 2B carcinogen. Hexavalent Chromium (Chromium VI) may cause lung, nasal, and/or sinus cancer. Vanadium pentoxide (V2O5) affects eyes, skin, respiratory system. Soluble molybdenum compounds such as molybdenum trioxide may cause lung irritation.

Section 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

- Inhalation
  Not an expected route of exposure for product in massive form.

- Eye contact
  Not an expected route of exposure for product in massive form.

- Skin Contact
  Product not classified.

- Ingestion
  Product not classified. Not an expected route of exposure for product in massive form.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>&gt; 5000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Vanadium</td>
<td>&gt; 2000 mg/kg bw</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>&gt; 2000 mg/kg bw</td>
<td>&gt; 2000 mg/kg bw</td>
<td>&gt; 5.10 mg/L</td>
</tr>
<tr>
<td>Zirconium</td>
<td>5000 mg/kg bw</td>
<td>-</td>
<td>&gt; 4.3 mg/L</td>
</tr>
<tr>
<td>Chromium</td>
<td>&gt; 3400 mg/kg bw</td>
<td>-</td>
<td>&gt; 5.41 mg/L</td>
</tr>
<tr>
<td>Niobium</td>
<td>&gt; 10,000 mg/kg bw</td>
<td>&gt; 2000 mg/kg bw</td>
<td>-</td>
</tr>
<tr>
<td>Tin</td>
<td>&gt; 2000 mg/kg bw</td>
<td>&gt; 2000 mg/kg bw</td>
<td>&gt; 4.75 mg/L</td>
</tr>
<tr>
<td>Aluminium</td>
<td>15,900 mg/kg bw</td>
<td>-</td>
<td>&gt; 1 mg/L</td>
</tr>
<tr>
<td>Silicon</td>
<td>&gt; 5000 mg/kg bw</td>
<td>&gt; 5000 mg/kg bw</td>
<td>&gt; 2.08 mg/L</td>
</tr>
</tbody>
</table>

Information on toxicological effects
Symptoms
None known.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Acute toxicity
Product not classified.

Skin corrosion/irritation
Product not classified.

Serious eye damage/eye irritation
Product not classified.

Sensitisation
Product not classified.

Germ cell mutagenicity
Product not classified.

Carcinogenicity
Product not classified.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium 7440-47-3</td>
<td></td>
<td>Group 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproductive toxicity
Product not classified.

STOT - single exposure
Product not classified.

STOT - repeated exposure
Product not classified.

Aspiration hazard
Product not classified.

Section 12: ECOLOGICAL INFORMATION

12.1. Toxicity
This product as shipped is not classified for aquatic toxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to Micro-organisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>The 72 h EC50 of titanium dioxide to Pseudokirchneriella subcapitata was 61 mg of TiO2/L.</td>
<td>The 96 h LC50 of titanium dioxide to Cyprinodon variegatus was greater than 10,000 mg of TiO2/L. The 96 h LC50 of titanium dioxide to Pimephales promelas was greater than 1,000 mg of TiO2/L.</td>
<td>The 3 h EC50 of titanium dioxide for activated sludge were greater than 1000 mg/L.</td>
<td>The 48 h EC50 of titanium dioxide to Daphnia Magna was greater than 1000 mg of TiO2/L.</td>
</tr>
<tr>
<td>Vanadium</td>
<td>The 72 h EC50 of vanadium pentoxide to Desmodesmus subspicatus was 2,907 ug of V/L.</td>
<td>The 96 h LC50 of vanadium pentoxide to Pimephales promelas was 1,850 ug of V/L.</td>
<td>The 3 h EC50 of sodium metavanadate for activated sludge was greater than 100 mg/L.</td>
<td>The 48 h EC50 of sodium vanadate to Daphnia magna was 2,661 ug of V/L.</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>The 72 h EC50 of sodium molybdate dihydrate to Pseudokirchneriella subcapitata was 362.9 mg of Mo/L.</td>
<td>The 96 h LC50 of sodium molybdate dihydrate to Pimephales promelas was 644.2 mg/L.</td>
<td>The 3 h EC50 of molybdenum trioxide for activated sludge was greater than 820 mg/L.</td>
<td>The 48 h LC50 of sodium molybdate dihydrate to Ceriodaphnia dubia was 1,015 mg/L. The 48 h LC50 of sodium molybdate dihydrate to Daphnia magna was greater than 1,727.8 mg/L.</td>
</tr>
<tr>
<td>Zirconium</td>
<td>The 14 d NOEC of zirconium dichloride oxide to Chlorella vulgaris was greater than 102.5 mg of Zr/L.</td>
<td>The 96 h LL50 of zirconium to Danio rerio was greater than 74.03 mg/L.</td>
<td>-</td>
<td>The 48 h EC50 of zirconium dioxide to Daphnia magna was greater than 74.03 mg of Zr/L.</td>
</tr>
<tr>
<td>Chromium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Niobium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Tin
The 72 h EC50 of tin chloride pentahydrate to Pseudokirchnerella subcapitata was 9,846 ug of Sn/L.

The 7 d LOEC of tin chloride pentahydrate to Pimephales promelas was 827.9 ug of Sn/L.

The 7 d LC50 of tin chloride pentahydrate to Ceriodaphnia dubia was greater than 3,200 ug of Sn/L.

Aluminium
The 96-h EC50 values for reduction of biomass of Pseudokirchneriella subcapitata in AAP-Medium at pH 6, 7, and 8 were estimated as 20.1, 5.4, and 150.6 µg/L, respectively, for dissolved Al.

The 96 h LC50 of aluminum to Oncorhynchus mykiss was 7.4 mg of Al/L at pH 6.5 and 14.6 mg of Al/L at pH 7.5.

The 48-hr LC50 for Ceriodaphnia dubia exposed to Aluminium chloride increased from 0.72 to greater than 99.6 mg/L with water hardness increasing from 25 to 200 mg/L.

Silicon
The 72 h EC50 of sodium metasilicate pentahydrate to Pseudokirchneriella subcapitata was greater than 250 mg/L.

12.2. Persistence and degradability

12.3. Bioaccumulative potential

12.4. Mobility in soil

12.5. Results of PBT and vPvB assessment

The PBT and vPvB criteria do not apply to inorganic substances.

12.6. Other adverse effects

---

Section 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from residues/unused products
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging
None anticipated.

Section 14: TRANSPORT INFORMATION

IMDG
14.1 UN/ID no
Not regulated
14.2 Proper shipping name
Not regulated
14.3 Hazard Class
Not regulated
14.4 Packing Group
Not regulated
14.5 Marine pollutant
Not applicable
14.6 Special Provisions
None
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

RID
14.1 UN/ID no
Not regulated
14.2 Proper shipping name
Not regulated
14.3 Hazard Class Not regulated
14.4 Packing Group Not regulated
14.5 Environmental hazard Not applicable
14.6 Special Provisions None

ADR
14.1 UN/ID no Not regulated
14.2 Proper shipping name Not regulated
14.3 Hazard Class Not regulated
14.4 Packing Group Not regulated
14.5 Environmental hazard Not applicable
14.6 Special Provisions None

ICAO (air)
14.1 UN/ID no Not regulated
14.2 Proper shipping name Not regulated
14.3 Hazard Class Not regulated
14.4 Packing Group Not regulated
14.5 Environmental hazard Not applicable
14.6 Special Provisions None

IATA
14.1 UN/ID no Not regulated
14.2 Proper shipping name Not regulated
14.3 Hazard Class Not regulated
14.4 Packing Group Not regulated
14.5 Environmental hazard Not applicable
14.6 Special Provisions None

Section 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>French RG number</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7440-32-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanadium</td>
<td>RG 66</td>
<td>-</td>
</tr>
<tr>
<td>7440-62-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Molybdenum</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7439-98-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zirconium</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7440-67-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>RG 10</td>
<td>-</td>
</tr>
<tr>
<td>7440-47-3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niobium</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7440-03-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7440-31-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminium</td>
<td>RG 32</td>
<td>-</td>
</tr>
<tr>
<td>7429-90-5</td>
<td>RG 16,RG 16bis</td>
<td></td>
</tr>
<tr>
<td>Silicon</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7440-21-3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

European Union

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

Authorisations and/or restrictions on use:
This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV). This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).
15.2. Chemical safety assessment

No chemical safety assessment has been performed for this product.

Section 16: OTHER INFORMATION

<table>
<thead>
<tr>
<th>Issue Date</th>
<th>28-May-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision Date</td>
<td>21-Nov-2016</td>
</tr>
<tr>
<td>Revision Note</td>
<td>SDS sections updated: 6, 7.</td>
</tr>
</tbody>
</table>

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Note:
The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Additional information available from: Safety data sheets and labels available at ATImetals.com

End of Safety Data Sheet