SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product name
Silicon tetrachloride
EC No (from EINECS): 233-054-0
CAS No: 10026-04-7
Index-Nr. 014-002-00-4
Chemical formula SiCl4
REACH Registration number: Not available.

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses
Industrial and professional. Perform risk assessment prior to use.
Uses advised against
Consumer use.

1.3. Details of the supplier of the safety data sheet
Company identification
BOC, PO Box 1201, Bluebell, Dublin
E-Mail Address ReachSDS@boc.com

1.4. Emergency telephone number
Emergency phone numbers (24h): 1850 333 435

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
Classification acc. to Regulation (EC) No 1272/2008/EC (CLP/GHS)
Acute Tox. 3 - Toxic if swallowed.
Acute Tox. 3 - Toxic if inhaled.
Skin Corr. 1A - Causes severe skin burns and eye damage.
Eye Dam. 1 - Causes serious eye damage.

Proposed by the industry
Xn; R20/22 | R35 | Xi; R37
Harmful by inhalation and if swallowed
Reacts violently with water
Causes severe burns.
Irritating to respiratory system

2.2. Label elements
- Labelling Pictograms

- Signal word Danger

- Hazard Statements
  H301 Toxic if swallowed.
  H331 Toxic if inhaled.
  H314 Causes severe skin burns and eye damage.
  EUH014 Reacts violently with water.
  EUH071 Corrosive to the respiratory tract.

- Precautionary Statements
  Precautionary Statement Prevention
  P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  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.

  Precautionary Statement Response
  P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
  P304+P340+P315 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical advice/attention.
  P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P305+P351+P338+P315 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

  Precautionary Statement Storage
  P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

  Precautionary Statement Disposal None

SECTION 3: Composition/information on ingredients

Substance / Mixture
Substance.

3.1. Substances
Silicon tetrachloride
CAS No: 10026-04-7
Index-Nr.: 014-002-00-4
EC No (from EINECS): 233-054-0
REACH Registration number: Not available.

Contains no other components or impurities which will influence the classification of the product.

3.2. Mixtures
Not applicable.

SECTION 4: First aid measures

4.1. Description of first aid measures
First Aid General Information:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Inhalation:
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First Aid Skin / Eye:
Safety data sheet
Silicon tetrachloride

For liquid spillage - flush with water for at least 15 minutes. Immediately flush eyes thoroughly with water for at least 15 minutes. Obtain medical assistance.

First Aid Ingestion:
Do not give victim anything to drink if they are unconscious. Do not induce vomiting. Rinse mouth with water, call a doctor.

4.2. Most important symptoms and effects, both acute and delayed
Causes serious irritation to cornea (with temporary disturbance to vision). Irritating to eyes, respiratory system, mucous membranes and skin. Symptoms include: shortness of breath, headache and nausea.

4.3. Indication of any immediate medical attention and special treatment needed
Obtain medical assistance. Treat with a corticosteroid spray as soon as possible after inhalation.

SECTION 5: Fire fighting measures

5.1. Extinguishing media
Alcohol-resistant foam. Dry Powder. Carbon dioxide. Water fog. Use water spray or fog to control fire fumes

Unsuitable extinguishing media
Do not use a solid water stream.

5.2. Special hazards arising from the substance or mixture
Exposure to fire may cause containers to rupture/explode. Hazardous combustion products
If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Hydrogen chloride gas, Silicon oxides.

5.3. Advice for fire-fighters
If possible, stop flow of product. Move container away or cool with water from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

Special protective equipment for fire fighters
Gas tight chemically protective clothing (Type 1) in combination with self contained breathing apparatus.
EN 943-2:2002: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Use self-contained breathing apparatus and chemically protective clothing. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.2. Environmental precautions
Try to stop release.

6.3. Methods and material for containment and cleaning up
Ventilate area. Absorb excess liquid spillage on inorganic adsorbent material such as fine sand, brick dust etc. Place spent adsorbent in sealed packages and contact specialist waste disposal contractor. Dispose of waste according to national legislation.

6.4. Reference to other sections
See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Only experienced and properly instructed persons should handle the product. The substance must be handled in accordance with good industrial hygiene and safety procedures. Avoid contact with skin. Avoid exposure, obtain special instructions before use. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your supplier if in doubt. Do not smoke while handling product. Ensure the complete system has been (or is regularly) checked for leaks before use. Refer to supplier's handling instructions. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.

Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contamination.


7.2. Conditions for safe storage, including any incompatibilities
Observe all regulations and local requirements regarding storage of containers. Segregate from other oxidants in store. Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent falling over. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. Containers should not be stored in conditions likely to encourage corrosion.

7.3. Specific end use(s)
None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
No occupational exposure limit.

PNEC not available.
**Safety data sheet**

**Silicon tetrachloride**

**9.1. Information on basic physical and chemical properties**

- **Appearance/Colour:** Colourless/light yellow liquid.
- **Odour:** Pungent. Extremely disagreeable.
- **Odour threshold:** Odour threshold is subjective and inadequate to warn for over exposure.
- **Melting point:** -70°C
- **Boiling point:** 57.6°C
- **Flash point:** Not applicable
- **Vapour Pressure 20 °C:** 0.26 bar(a)
- **Relative density, gas (air=1):** 5.9
- **Solubility in water:** Hydrolyses.
- **Partition coefficient: n-octanol/water:** No data available.
- **Molecular weight:** 169.9 g/mol
- **Relative density, liquid (water=1):** 1.5

**9.2. Other information**

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

**SECTION 10: Stability and reactivity**

**10.1. Reactivity**

Unreactive under normal conditions.

**10.2. Chemical stability**

Stable under normal conditions.

**10.3. Possibility of hazardous reactions**

Reacts with water.

**10.4. Conditions to avoid**

Avoid moisture in installation systems.

**10.5. Incompatible materials**


For material compatibility see latest version of ISO-11114.

**10.6. Hazardous decomposition products**

If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition:
Hydrogen chloride gas, Silicon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute inhalation toxicity
Value type: LC50
Value: 1312 ppm
Exposure time: 1 h

Skin irritation
Species: Rabbit
Exposure time: 24h
Result: Severe skin irritation

Eye irritation
Species: Rabbit
Exposure time: 24h
Result: Moderate eye irritation

Sensitization
No data available.

Germ cell mutagenicity
Result: Negative.
Guideline: OECD Guideline 471 (Bacterial Reverse Mutation Assay)

Carcinogenicity
No evidence of carcinogenic effects.

Reproductive toxicity
Value type: NOAEL
Value: 10 mg/kg bw/day
Sex: Male

Value type: NOAEL
Value: 50 mg/kg bw/day
Sex: Female

Remarks: No known effects from this product.

STOT-single exposure
May cause respiratory irritation.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

SECTION 12: Ecological information

12.1. Toxicity

Acute and prolonged toxicity fish
Species: Zebra fish (Danio rerio)
Exposure time: 96 h
Value type: NOEC
Value in standard unit: ≥ 245 mg/L

Acute toxicity aquatic invertebrates
Species: Water flea (Daphnia magna)
Exposure time: 48 h
Value type: NOEC
Value in standard unit: ≥ 844 mg/L

Toxicity aquatic plants
Species: Algae
Exposure time: 72 h
Guideline: OECD Guideline 201 (Alga, Growth Inhibition Test)

Value type: NOEC
Value in standard unit: ≥ 100 mg/L

12.2. Persistence and degradability
The substance hydrolyses rapidly to HCl and silicon tetrahydroxide. HCl and silicon tetrahydroxide are inorganic, therefore in accordance with Column 2 of REACH Annex VII, there is no need to conduct the ready biodegradation study.

12.3. Bioaccumulative potential
The substance hydrolyses rapidly to HCl and silicon tetrahydroxide. Silicon tetrahydroxide has a low log Kow value and thus has low potential for bioaccumulation.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

12.6. Other adverse effects
No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Must not be discharged to atmosphere. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods. Contact supplier if guidance is required. Dispose of container via gas supplier only.

SECTION 14: Transport information

ADR/RID

14.1. UN number
1818

14.2. UN proper shipping name
Silicon tetrachloride

14.3. Transport hazard class(es)
Class: 8
Classification Code: C1
Labels: 8
Hazard number: X80

14.4. Packing group (Packing Instruction)
II

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

IMDG

14.1. UN number
1818

14.2. UN proper shipping name
Silicon tetrachloride

14.3. Transport hazard class(es)
Class: 8
14.4. Packing group (Packing Instruction) II

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

IATA

14.1. UN number
1818

14.2. UN proper shipping name
Silicon tetrachloride

14.3. Transport hazard class(es)
Class: 8
Classification Code: C1
Labels: 8
Hazard number: X80

14.4. Packing group (Packing Instruction) II

14.5. Environmental hazards
None.

14.6. Special precautions for user
None.

Other transport information

Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Ensure that the valve outlet cap nut or plug (where provided) is correctly fitted. Ensure that the valve protection device (where provided) is correctly fitted. Ensure adequate ventilation. Ensure compliance with applicable regulations.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Seveso Directive 96/82/EC: Covered

15.2. Chemical safety assessment
Other regulations


This Safety Data Sheet has been produced to comply with Regulation (EU) 453/2010.

15.2. Chemical safety assessment
CSA has not been carried out.

SECTION 16: Other information

Ensure all national/local regulations are observed. Ensure operators understand the toxicity hazard. Users of breathing apparatus must be trained. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Advice

Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. Details given in this document are believed to be correct at the time of going to press.

Further information

Note:
When using this document care should be taken, as the decimal sign and its position complies with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

References

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/)
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets.
European Industrial Gases Association (EIGA) Doc. 169/11 Classification and Labelling guide.
ISO 10156:2010 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.
International Programme on Chemical Safety (http://www.inchem.org/)
National Institute for Standards and Technology (NIST) Standard Reference Database Number 69
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (http://ecb.jrc.ec.europa.eu/esis/).
The European Chemical Industry Council (CEFIC) ERICards.
Substance specific information from suppliers.

End of document