

## 1 Identification

### Product identifier

**Product name:** Tetrachlorobis(tetrahydrofuran)zirconium (IV)

**Stock number:** 39550

**CAS Number:**

21959-01-3

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

**Identified use:** SU24 Scientific research and development

### Details of the supplier of the safety data sheet

#### Manufacturer/Supplier:

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

**Information Department:** Health, Safety and Environmental Department

#### Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

### Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)



GHS02 Flame

Flam. Sol. 1 H228 Flammable solid.



GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

**Hazards not otherwise classified** No information known.

### Label elements

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

#### Hazard pictograms



GHS02 GHS05

### Signal word

Danger

### Hazard statements

H228 Flammable solid.

H314 Causes severe skin burns and eye damage.

### Precautionary statements

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### WHMIS classification

B4 - Flammable solid

D2B - Toxic material causing other toxic effects

E - Corrosive material



### Classification system

#### HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH 3 Health (acute effects) = 3

FIRE 2 Flammability = 2

REACTIVITY 2 Physical Hazard = 2

### Other hazards

#### Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

## 3 Composition/information on ingredients

### Chemical characterization: Substances

#### CAS# Description:

21959-01-3 Tetrachlorobis(tetrahydrofuran)zirconium (IV)

## 4 First-aid measures

### Description of first aid measures

**General information** Immediately remove any clothing soiled by the product.

#### After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

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**After skin contact**  
Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.  
**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.  
**After swallowing** Seek medical treatment.  
**Information for doctor**  
**Most important symptoms and effects, both acute and delayed**  
Causes severe skin burns.  
Causes serious eye damage.  
**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

**5 Fire-fighting measures**

**Extinguishing media**  
**Suitable extinguishing agents** In case of fire, use sand, carbon dioxide or powdered extinguishing agent. Never use water.  
**For safety reasons unsuitable extinguishing agents** Water  
**Special hazards arising from the substance or mixture**  
Reacts with water forming hydrochloric acid (HCl)  
If this product is involved in a fire, the following can be released:  
Carbon monoxide and carbon dioxide  
Hydrogen chloride (HCl)  
Metal oxide fume  
**Advice for firefighters**  
**Protective equipment:**  
Wear self-contained respirator.  
Wear fully protective impervious suit.

**6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation  
Keep away from ignition sources  
**Environmental precautions:** Do not allow material to be released to the environment without proper governmental permits.  
**Methods and material for containment and cleaning up:**  
Keep away from ignition sources.  
Use neutralizing agent.  
Dispose of contaminated material as waste according to section 13.  
Ensure adequate ventilation.  
**Prevention of secondary hazards:** Keep away from ignition sources.  
**Reference to other sections**  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

**7 Handling and storage**

**Handling**  
**Precautions for safe handling**  
Handle under dry protective gas.  
Keep container tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation at the workplace.  
**Information about protection against explosions and fires:** Protect against electrostatic charges.  
**Conditions for safe storage, including any incompatibilities**  
**Storage**  
**Requirements to be met by storerooms and receptacles:** Store in a cool location.  
**Information about storage in one common storage facility:**  
Store away from water/moisture.  
Store away from strong bases.  
Store away from oxidizing agents.  
**Further information about storage conditions:**  
Store under dry inert gas.  
This product is moisture sensitive.  
Keep container tightly sealed.  
Store in cool, dry conditions in well sealed containers.  
Protect from humidity and water.  
**Specific end use(s)** No further relevant information available.

**8 Exposure controls/personal protection**

**Additional information about design of technical systems:**  
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.  
**Control parameters**  
**Components with limit values that require monitoring at the workplace:**  
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.  
**Additional information:** No data  
**Exposure controls**  
**Personal protective equipment**  
**General protective and hygienic measures**  
The usual precautionary measures for handling chemicals should be followed.  
Keep away from foodstuffs, beverages and feed.  
Remove all soiled and contaminated clothing immediately.  
Wash hands before breaks and at the end of work.  
Avoid contact with the eyes and skin.  
Maintain an ergonomically appropriate working environment.  
**Breathing equipment:** Use suitable respirator when high concentrations are present.  
**Protection of hands:**  
Impervious gloves  
Check protective gloves prior to each use for their proper condition.  
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.  
**Penetration time of glove material (in minutes)** Not determined  
**Eye protection:**  
Tightly sealed goggles

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**Product name:** **Tetrachlorobis(tetrahydrofuran)zirconium (IV)**

Full face protection  
**Body protection:** Protective work clothing.

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**9 Physical and chemical properties**

<b>Information on basic physical and chemical properties</b>	
<b>General Information</b>	
<b>Appearance:</b>	
Form:	Crystalline
Color:	White to off-white
Odor:	Not determined
Odor threshold:	Not determined.
<b>pH-value:</b>	
Not applicable.	
<b>Change in condition</b>	
Melting point/Melting range:	175-177 °C (347-351 °F)
Boiling point/Boiling range:	Not determined
Sublimation temperature / start:	Not determined
<b>Flash point:</b>	
Not applicable	
<b>Flammability (solid, gaseous)</b>	
Highly flammable.	
<b>Ignition temperature:</b>	
Not determined	
<b>Decomposition temperature:</b>	
Not determined	
<b>Auto igniting:</b>	
Not determined.	
<b>Danger of explosion:</b>	
Product does not present an explosion hazard.	
<b>Explosion limits:</b>	
Lower:	Not determined
Upper:	Not determined
<b>Vapor pressure:</b>	
Not applicable.	
<b>Density:</b>	
Not determined	
<b>Relative density</b>	
Not determined.	
<b>Vapor density</b>	
Not applicable.	
<b>Evaporation rate</b>	
Not applicable.	
<b>Solubility in / Miscibility with</b>	
Water:	Reacts
<b>Partition coefficient (n-octanol/water):</b>	
Not determined.	
<b>Viscosity:</b>	
dynamic:	Not applicable.
kinematic:	Not applicable.
<b>Other information</b>	
No further relevant information available.	

**10 Stability and reactivity**

<b>Reactivity</b> No information known.	
<b>Chemical stability</b> Stable under recommended storage conditions.	
<b>Thermal decomposition / conditions to be avoided:</b> Decomposition will not occur if used and stored according to specifications.	
<b>Possibility of hazardous reactions</b>	
Reacts with water forming hydrochloric acid (HCl)	
Reacts with strong oxidizing agents	
<b>Conditions to avoid</b> No further relevant information available.	
<b>Incompatible materials:</b>	
Oxidizing agents	
Water/moisture	
Bases	
<b>Hazardous decomposition products:</b>	
Hydrogen chloride (HCl)	
Carbon monoxide and carbon dioxide	
Corrosive gases/vapors	
Metal oxide fume	

**11 Toxicological information**

<b>Information on toxicological effects</b>	
<b>Acute toxicity:</b> Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.	
<b>LD/LC50 values that are relevant for classification:</b> No data	
<b>Skin irritation or corrosion:</b> Causes severe skin burns.	
<b>Eye irritation or corrosion:</b> Causes serious eye damage.	
<b>Sensitization:</b> No sensitizing effects known.	
<b>Germ cell mutagenicity:</b> No effects known.	
<b>Carcinogenicity:</b>	
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.	
<b>Reproductive toxicity:</b> No effects known.	
<b>Specific target organ system toxicity - repeated exposure:</b> No effects known.	
<b>Specific target organ system toxicity - single exposure:</b> No effects known.	
<b>Aspiration hazard:</b> No effects known.	
<b>Subacute to chronic toxicity:</b> No effects known.	
<b>Additional toxicological information:</b> To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.	

**12 Ecological information**

<b>Toxicity</b>	
<b>Aquatic toxicity:</b> No further relevant information available.	
<b>Persistence and degradability</b> No further relevant information available.	
<b>Bioaccumulative potential</b> No further relevant information available.	
<b>Mobility in soil</b> No further relevant information available.	
<b>Additional ecological information:</b>	
<b>General notes:</b>	
Do not allow material to be released to the environment without proper governmental permits.	
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.	
Avoid transfer into the environment.	
<b>Results of PBT and vPvB assessment</b>	
<b>PBT:</b> Not applicable.	
<b>vPvB:</b> Not applicable.	

**Product name: Tetrachlorobis(tetrahydrofuran)zirconium (IV)**

**Other adverse effects** No further relevant information available.

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### 13 Disposal considerations

**Waste treatment methods**

**Recommendation** Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packagings:**

**Recommendation:** Disposal must be made according to official regulations.

### 14 Transport information

**UN-Number**

**DOT, IMDG, IATA**

UN2925

**UN proper shipping name**

**DOT**

Flammable solids, corrosive, organic, n.o.s. (Tetrachlorobis(tetrahydrofuran)zirconium (IV))

**IMDG, IATA**

FLAMMABLE SOLID, CORROSIVE, ORGANIC, N.O.S. (Tetrachlorobis(tetrahydrofuran)zirconium (IV))

**Transport hazard class(es)**

**DOT**



**Class**

**Label**

**Class**

4.1 Flammable solids, self-reactive substances and solid desensitised explosives.

4.1+8

4.1 (FC1) Flammable solids, self-reactive substances and solid desensitised explosives

4.1+8

**Label**

**IMDG, IATA**



**Class**

**Label**

4.1 Flammable solids, self-reactive substances and solid desensitised explosives.

4.1+8

**Packing group**

**DOT, IMDG, IATA**

II

**Environmental hazards:**

Not applicable.

**Special precautions for user**

Warning: Flammable solids, self-reactive substances and solid desensitised explosives

**EMS Number:**

F-A,S-G

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

**Transport/Additional information:**

**DOT**

**Marine Pollutant (DOT):**

No

**UN "Model Regulation":**

UN2925, Flammable solids, corrosive, organic, n.o.s. (Tetrachlorobis(tetrahydrofuran)zirconium (IV)), 4.1 (8), II

### 15 Regulatory information

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

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

**Hazard pictograms**



GHS02 GHS05

**Signal word** Danger

**Hazard statements**

H228 Flammable solid.

H314 Causes severe skin burns and eye damage.

**Precautionary statements**

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**National regulations**

This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

**SARA Section 313 (specific toxic chemical listings)** Substance is not listed.

**California Proposition 65**

**Prop 65 - Chemicals known to cause cancer** Substance is not listed.

**Prop 65 - Developmental toxicity** Substance is not listed.

**Prop 65 - Developmental toxicity, female** Substance is not listed.

**Prop 65 - Developmental toxicity, male** Substance is not listed.

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.** Substance is not listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.

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USA

Product name: <b>Tetrachlorobis(tetrahydrofuran)zirconium (IV)</b>	
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.	
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<b>16 Other information</b> <i>Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.</i> <b>Department issuing SDS:</b> Global Marketing Department <b>Date of preparation / last revision</b> 11/24/2015 / - <b>Abbreviations and acronyms:</b> ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road) IMDG: International Maritime Code for Dangerous Goods DOT: US Department of Transportation IATA: International Air Transport Association CAS: Chemical Abstracts Service (division of the American Chemical Society) HMIS: Hazardous Materials Identification System (USA) WHMIS: Workplace Hazardous Materials Information System (Canada) LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent vPvB: very Persistent and very Bioaccumulative ACGIH: American Conference of Governmental Industrial Hygienists (USA) OSHA: Occupational Safety and Health Administration (USA) NTP: National Toxicology Program (USA) IARC: International Agency for Research on Cancer EPA: Environmental Protection Agency (USA)	
USA	