

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Zirconium(IV) chloride

Product Number : 221880

Brand : Aldrich

Product Use : For laboratory research purposes.

Supplier : Sigma-Aldrich Canada Co.  
2149 Winston Park Drive  
OAKVILLE ON L6H 6J8  
CANADA

Manufacturer : Sigma-Aldrich Corporation  
3050 Spruce St.  
St. Louis, Missouri 63103  
USA

Telephone : +1 9058299500

Fax : +1 9058299292

Emergency Phone # (For both supplier and manufacturer) : 1-800-424-9300

Preparation Information : Sigma-Aldrich Corporation  
Product Safety - Americas Region  
1-800-521-8956

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

#### WHMIS Classification

D2B Toxic Material Causing Other Toxic Effects Moderate eye irritant  
E Corrosive Material Corrosive

#### GHS Classification

Acute toxicity, Oral (Category 4)  
Skin corrosion (Category 1B)  
Serious eye damage (Category 1)  
Acute aquatic toxicity (Category 2)

#### GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)

H302 Harmful if swallowed.  
H314 Causes severe skin burns and eye damage.  
H401 Toxic to aquatic life.

Precautionary statement(s)

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310 Immediately call a POISON CENTER or doctor/ physician.

#### HMIS Classification

Health hazard: 3  
Flammability: 0  
Physical hazards: 0

## Potential Health Effects

<b>Inhalation</b>	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
<b>Skin</b>	Harmful if absorbed through skin. Causes skin burns.
<b>Eyes</b>	Causes eye burns.
<b>Ingestion</b>	Harmful if swallowed.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : Zirconium tetrachloride

Formula :  $\text{Cl}_4\text{Zr}$

Molecular Weight : 233.04 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Zirconium tetrachloride</b>			
10026-11-6	233-058-2	-	-

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## 4. FIRST AID MEASURES

### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

### If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

### In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

### In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

### If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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## 5. FIREFIGHTING MEASURES

### Conditions of flammability

Not flammable or combustible.

### Suitable extinguishing media

Dry powder

### Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

### Hazardous combustion products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Zirconium oxides

### Explosion data - sensitivity to mechanical impact

no data available

### Explosion data - sensitivity to static discharge

no data available

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## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

### Environmental precautions

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

### Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Do not flush with water. Keep in suitable, closed containers for disposal.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

### Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

Never allow product to get in contact with water during storage.

Handle and store under inert gas. Moisture sensitive. Keep in a dry place.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Basis
Zirconium tetrachloride	10026-11-6	STEV	10 mg/m <sup>3</sup>	Canada. Ontario OELs
		TWA	5 mg/m <sup>3</sup>	Canada. British Columbia OEL
		TWA	5 mg/m <sup>3</sup>	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		STEL	10 mg/m <sup>3</sup>	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		TWA	5 mg/m <sup>3</sup>	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		STEL	10 mg/m <sup>3</sup>	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWAE V	5 mg/m <sup>3</sup>	Canada. Ontario OELs
		STEL	10 mg/m <sup>3</sup>	Canada. British Columbia OEL
		TWA	5 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
		Remarks	Not classifiable as a human carcinogen	
		STEL	10 mg/m <sup>3</sup>	USA. ACGIH Threshold Limit Values (TLV)
	Not classifiable as a human carcinogen			
		TWA	5 mg/m <sup>3</sup>	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		STEL	10 mg/m <sup>3</sup>	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
		TWAE V	5 mg/m <sup>3</sup>	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		STEV	10 mg/m <sup>3</sup>	Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for airborne contaminants
		TWA	5 mg/m <sup>3</sup>	Canada. British Columbia OEL

STEL

10 mg/m<sup>3</sup>

Canada. British Columbia OEL

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

## Full contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

## Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Eye protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Specific engineering controls**

Use mechanical exhaust or laboratory fumehood to avoid exposure.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form powder

Colour white

**Safety data**

pH no data available

Melting point/freezing point Melting point/range: 331 °C (628 °F)

Boiling point no data available

Flash point not applicable

Ignition temperature no data available

Auto-ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	1 hPa (1 mmHg) at 190 °C (374 °F)
Density	2.8 g/cm <sup>3</sup> at 25 °C (77 °F)
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

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## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

Reacts violently with water.

### Conditions to avoid

Exposure to moisture.

### Materials to avoid

acids, Alcohols, Amines, Reacts violently with water.

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Zirconium oxides  
 Reacts with water to form: - hydrochloric acid

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## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

LD50 Oral - rat - 1,688 mg/kg

#### Inhalation LC50

no data available

#### Dermal LD50

no data available

#### Other information on acute toxicity

no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/eye irritation

no data available

### Respiratory or skin sensitisation

no data available

### Germ cell mutagenicity

no data available

### **Carcinogenicity**

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

### **Reproductive toxicity**

no data available

### **Teratogenicity**

no data available

### **Specific target organ toxicity - single exposure (Globally Harmonized System)**

no data available

### **Specific target organ toxicity - repeated exposure (Globally Harmonized System)**

no data available

### **Aspiration hazard**

no data available

### **Potential health effects**

<b>Inhalation</b>	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
<b>Ingestion</b>	Harmful if swallowed.
<b>Skin</b>	Harmful if absorbed through skin. Causes skin burns.
<b>Eyes</b>	Causes eye burns.

### **Signs and Symptoms of Exposure**

Granulomatous lesions have been observed in susceptible individuals following use of preparations containing zirconium. The lesions are probably of allergic epitheloid origin., Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache

### **Synergistic effects**

no data available

### **Additional Information**

RTECS: ZH7175000

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## **12. ECOLOGICAL INFORMATION**

### **Toxicity**

Toxicity to algae Growth inhibition EC50 - Pseudokirchneriella subcapitata - 2.6 mg/l - 96 h

### **Persistence and degradability**

no data available

### **Bioaccumulative potential**

no data available

### **Mobility in soil**

no data available

### **PBT and vPvB assessment**

no data available

**Other adverse effects**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Toxic to aquatic life.

no data available

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**13. DISPOSAL CONSIDERATIONS**

**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

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**14. TRANSPORT INFORMATION**

**DOT (US)**

UN number: 2503 Class: 8 Packing group: III  
Proper shipping name: Zirconium tetrachloride  
Reportable Quantity (RQ): 5000 lbs  
Marine pollutant: No  
Poison Inhalation Hazard: No

**IMDG**

UN number: 2503 Class: 8 Packing group: III EMS-No: F-A, S-B  
Proper shipping name: ZIRCONIUM TETRACHLORIDE  
Marine pollutant: No

**IATA**

UN number: 2503 Class: 8 Packing group: III  
Proper shipping name: Zirconium tetrachloride

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**15. REGULATORY INFORMATION**

**WHMIS Classification**

D2B	Toxic Material Causing Other Toxic Effects	Moderate eye irritant
E	Corrosive Material	Corrosive

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

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**16. OTHER INFORMATION**

**Further information**

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