

## Material Safety Data Sheet

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Version 2.0

According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

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1 - Product and Company Information

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Product Name	ZINC CHLORIDE, MOLECULAR BIOLOGY REAGENT
Product Number	Z0173
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
Technical Phone #	+61 2 9841 0555 (1800 800 097)
Fax	+61 2 9841 0500 (1800 800 096)
Emergency Phone #	+44 8701906777 (1800 448 465)

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2 - Composition/Information on Ingredients

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Product Name	CAS #	EC no	Annex I Index Number
ZINC CHLORIDE	7646-85-7	231-592-0	030-003-00-2

  

Formula	ZnCl <sub>2</sub>
Molecular Weight	136.28 AMU
Synonyms	Butter of zinc * Chlorure de zinc (French) * Zinc butter * Zinc chloride fume (ACGIH:OSHA) * Zinc (chlorure de) (French) * Zinc dichloride * Zinco (cloruro di) (Italian) * Zinkchlorid (German) * Zinkchloride (Dutch)

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3 - Hazards Identification

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SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT  
Harmful if swallowed. Causes burns. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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4 - First Aid Measures

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## AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

## AFTER SKIN CONTACT

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

## AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

#### AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

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### 5 - Fire Fighting Measures

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#### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

#### SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

#### SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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### 6 - Accidental Release Measures

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PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL  
Evacuate area.

#### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

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### 7 - Handling and Storage

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#### HANDLING

Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### STORAGE

Conditions of Storage: Keep tightly closed. Store in a cool dry place. Handle and store under nitrogen.

SPECIAL REQUIREMENTS: Very hygroscopic.

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### 8 - Exposure Controls / Personal Protection

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#### ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

#### GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

#### EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	1 MG/M3
Poland		NDSCh	2 MG/M3
Poland		NDSP	-

#### EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.5 mg/m3

## EXPOSURE LIMITS - NORWAY

Source	Type	Value
OEL	OEL	1 mg/m3

## EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	1 mg/m3

Remarks: A

## EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	1 mg/m3
OEL	STEL	2 mg/m3

## PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

## 9 - Physical and Chemical Properties

Appearance	Physical State: Solid Color: White Form: Crystalline Powder	
Property	Value	At Temperature or Pressure
pH	5	20 °C Concentration: 100 g/l
BP/BP Range	732 °C	760 mmHg
MP/MP Range	293 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	1 mmHg	428 °C
SG/Density	2.907 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	1.4 - 1.8 kg/l	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:soluble	

## 10 - Stability and Reactivity

## STABILITY

Stable: Stable.

Conditions to Avoid: Moisture.

Materials to Avoid: Strong oxidizing agents.

## HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Zinc oxide fumes may also form,

Zinc/zinc oxides, Hydrogen chloride gas.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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11 - Toxicological Information

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RTECS NUMBER: ZH1400000

ACUTE TOXICITY

LD50  
Oral  
Rat  
350 mg/kg

LD50  
Intraperitoneal  
Rat  
58 MG/KG  
Remarks: Vascular:BP elevation not characterized in autonomic section. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Miosis (pupillary constriction). Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

LD50  
Intravenous  
Rat  
3690 UG/KG

LD50  
Oral  
Mouse  
329 mg/kg

LD50  
Intraperitoneal  
Mouse  
24 MG/KG

LD50  
Subcutaneous  
Mouse  
330 MG/KG

LD50  
Intravenous  
Mouse  
9090 UG/KG

LD50  
Oral  
Guinea pig  
200 mg/kg

SIGNS AND SYMPTOMS OF EXPOSURE

Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. To

the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

#### ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes burns.

Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

#### TARGET ORGAN INFORMATION

Liver. Kidneys.

#### CHRONIC EXPOSURE - CARCINOGEN

Hamster

Route of Application: Parenteral

Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Gastrointestinal:Colon tumors.

Chicken

Route of Application: Parenteral

Result: Tumorigenic Effects: Testicular tumors.

Tumorigenic:Equivocal tumorigenic agent by RTECS criteria.

#### CHRONIC EXPOSURE - MUTAGEN

Human

2 MMOL/L

Cell Type: fibroblast

DNA damage

Human

180 UMOL/L

Cell Type: lymphocyte

Unscheduled DNA synthesis

Human

360 UMOL/L

Cell Type: lymphocyte

DNA inhibition

Human

2 MG

Cell Type: lymphocyte

Other mutation test systems

Human

300 UMOL/L

Cell Type: lymphocyte

Cytogenetic analysis

Rat

700 MG/KG

Cell Type: Ascites tumor

Cytogenetic analysis

Mouse

16 MG/KG

Parenteral

## DNA inhibition

Mouse

18 GM/KG

Oral

30D

Cytogenetic analysis

Mouse

6 MG/KG

Cell Type: S. typhimurium

Host-mediated assay

Hamster

180 UMOL/L

Cell Type: Embryo

Morphological transformation.

## CHRONIC EXPOSURE - TERATOGEN

Species: Mouse

Dose: 12500 UG/KG

Route of Application: Intraperitoneal

Exposure Time: (11D PREG)

Result: Specific Developmental Abnormalities: Musculoskeletal system.

## CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat

Dose: 155 MG/KG

Route of Application: Oral

Exposure Time: (33D MALE)

Result: Endocrine: Change in gonadotropins. Endocrine: Change in LH. Paternal Effects: Other effects on male.

Species: Rat

Dose: 6 GM/KG

Route of Application: Oral

Exposure Time: (77D MALE/77D PRE-21D POST)

Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Behavioral.

Species: Rat

Dose: 30 GM/KG

Route of Application: Intraperitoneal

Exposure Time: (7-8D PREG)

Result: Effects on Embryo or Fetus: Fetal death. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat

Dose: 37500 UG/KG

Route of Application: Parenteral

Exposure Time: (10D PREG)

Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive).

Species: Mouse

Dose: 20500 UG/KG

Route of Application: Intraperitoneal

Exposure Time: (8D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rabbit  
Dose: 29184 UG/KG  
Route of Application: Intravaginal  
Exposure Time: (1D PRE)  
Result: Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated ).

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## 12 - Ecological Information

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### ECOTOXICOLOGICAL EFFECTS

Test Type: NOEC  
Species: *Selenastrum capricornutum* resp.  
Time: 96 h  
Value: 0.05 mg/l

Test Type: EC50 *Daphnia*  
Species: *Daphnia magna*  
Time: 48 h  
Value: 0.2 mg/l

Test Type: LC50 Fish  
Species: *Cyprinus carpio*  
Time: 96 h  
Value: 0.4 - 2.2 mg/l

Test Type: LC50 Fish  
Species: *Lepomis macrochirus* (Bluegill)  
Time: 96 h  
Value: 5.4 mg/l

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## 13 - Disposal Considerations

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### SUBSTANCE DISPOSAL

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. Observe all federal, state, and local environmental regulations.

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## 14 - Transport Information

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### RID/ADR

UN#: 2331  
Class: 8  
PG: III  
Proper Shipping Name: Zinc chloride, anhydrous

### IMDG

UN#: 2331  
Class: 8  
PG: III  
Proper Shipping Name: Zinc chloride, anhydrous  
Marine Pollutant: No  
Severe Marine Pollutant: No

IATA

UN#: 2331

Class: 8

PG: III

Proper Shipping Name: Zinc chloride, anhydrous

Inhalation Packing Group I: No

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15 - Regulatory Information

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CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 030-003-00-2

INDICATION OF DANGER: C-N

Corrosive. Dangerous for the environment.

R-PHRASES: 22-34-50/53

Harmful if swallowed. Causes burns. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 26-36/37/39-45-60-61

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 3

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16 - Other Information

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WARRANTY

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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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