

# SAFETY DATA SHEETS

According to the UN GHS revision 10

## 1: Identification

### 1.1 GHS Product identifier

**Product name** Tetrakis(diethylamino)zirconium

### 1.2 Other means of identification

**Product number** 13801-49-5

**Other names** Tetrakis(diethylamino)zirconium

### 1.3 Recommended use of the chemical and restrictions on use

**Identified uses** Industrial and scientific research use.

**Uses advised against** no data available

### 1.4 Supplier's details

**Company** Zhongshan Greenrock Technology Co., Ltd.

**Address** No. 138, Jinsan Avenue, Sanjiao Town, Zhongshan City, Guangdong Province, China

**Telephone** +86-2087066781

### 1.5 Emergency phone number

**Emergency phone number** +86-2087066781

**Service hours** Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

## 2: Hazard identification

### 2.1 Emergency Overview

It is highly corrosive and can cause irreversible damage to the skin and eyes. If in contact, rinse immediately with plenty of water and seek medical help as soon as possible.

### 2.2 GHS Classification

Flammable liquids : Category 2

Flammable liquids : Category 3

Substances and mixtures which in contact with water, emit flammable gases : Category 2

Substances and mixtures which in contact with water, emit flammable gases : Category 3

Skin corrosion/irritation : Category 1, 1A, 1B, 1C

Skin corrosion/irritation : Category 2

Serious eye damage/eye irritation : Category 2A

Specific target organ toxicity, single exposure; Respiratory tract irritation : Category 3

## 2.3 GHS label elements, including precautionary statements

### Pictogram(s)



### Signal word

Danger

### Hazard statement(s)

H225 Highly Flammable liquid and vapor

H226 Flammable liquid and vapor

H261 In contact with water releases flammable gas

H314 Causes severe skin burns and eye damage

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

### Precautionary statement(s)

#### Prevention

P210 Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking.

P223 Do not allow contact with water.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

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

P261 Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 Wash hands [and ...] thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P231+P232 Handle and store contents under inert gas/... Protect from moisture.

P264+P265 Wash hands [and ...] thoroughly after handling. Do not touch eyes.

<b>Response</b>	<p>P316 Get emergency medical help immediately.</p> <p>P319 Get medical help if you feel unwell.</p> <p>P321 Specific treatment (see ... on this label).</p> <p>P363 Wash contaminated clothing before reuse.</p> <p>P301+P330+P331 IF SWALLOWED,Rinse mouth. Do NOT induce vomiting.</p> <p>P302+P335+P334 Brush off loose particles from skin. Immerse in cool water [or wrap in wet bandages].</p> <p>P302+P352 IF ON SKIN,wash with plenty of water/...</p> <p>P302+P361+P354 IF ON SKIN,Take off Immediately all contaminated clothing. Immediately rinse with water for several minutes.</p> <p>P303+P361+P353 IF ON SKIN (or hair),Take off Immediately all contaminated clothing. Rinse SKIN with water [or shower].</p> <p>P304+P340 IF INHALED,Remove person to fresh air and keep comfortable for breathing.</p> <p>P305+P351+P338 IF IN EYES,Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.</p> <p>P305+P354+P338 IF IN EYES,Immediately rinse with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.</p> <p>P332+P317 If skin irritation occurs,Get medical help.</p> <p>P337+P317 If eye irritation persists,Get medical help.</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p> <p>P370+P378 In case of fire,Use ... to extinguish.</p>
<b>Storage</b>	<p>P405 Store locked up.</p> <p>P402+P404 Store in a dry place. Store in a closed container.</p> <p>P403+P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P403+P235 Store in a well-ventilated place. Keep cool.</p>
<b>Disposal</b>	<p>P501 Dispose of contents/container to ...</p>

## 2.4 Physical and chemical

Acidic or alkaline substances that react with metals to produce flammable hydrogen. May cause violent exothermic reactions when in contact with other substances. At high concentrations, they have strong oxidizing or reducing properties.

## 2.5 Health hazards

Skin contact: May cause severe burns, tissue necrosis, and scarring. Eye contact: May cause corneal damage, vision loss, or even blindness. Inhalation of vapor or mist may cause respiratory burns and pulmonary edema.

## 2.6 Environmental hazards

Leakage into the environment can change the pH value of soil and water, causing serious ecological damage. It is highly toxic to aquatic organisms and can cause the death of aquatic organisms and the collapse of the ecosystem.

## 2.7 Other hazards which do not result in classification

no data available

## 3: Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Tetrakis(diethylamino)zirconium	Tetrakis(diethylamino)zirconium	13801-49-5	625-460-5	99%

## 4: First-aid measures

### 4.1 General advice

Stop contact immediately and remove contaminated clothing; rinse the exposed area with plenty of running water and seek medical attention immediately with the material's SDS. If the corrosive substance is acidic (such as sulfuric acid), neutralize it with a weak alkaline solution (such as 5% sodium bicarbonate) after rinsing. For alkaline corrosive substances (such as sodium hydroxide), neutralize them with a weak acidic solution (such as 1% acetic acid).

### 4.2 If inhaled

Move to fresh air and keep the airway open. If corrosive vapors (such as hydrochloric acid mist) are inhaled, immediately administer nebulized inhalation (normal saline + dexamethasone). If laryngeal edema or breathing difficulties occur, immediately perform a tracheotomy (requires professional operation) and seek medical attention.

### 4.3 In case of skin contact

Rinse with plenty of running water for 20-30 minutes (make sure to rinse thoroughly, especially between the fingers, in the armpits, and other folds). If blisters are present, do not prick them; instead, apply a sterile gauze compress (to avoid adhesion). Do not apply oily ointments to avoid affecting subsequent treatment.

### 4.4 In case of eye contact

Immediately flush with an eyewash or plenty of normal saline for 15-20 minutes (use a gentle flow to avoid direct exposure to the cornea); apply antibiotic eye ointment (such as erythromycin ointment) to the eyelids, wear a sterile eye patch, and seek immediate medical attention from an ophthalmologist.

### 4.5 If swallowed

Do not induce vomiting (to avoid secondary damage to the esophageal mucosa). If the substance is acidic, take milk or egg white orally (to protect the gastric mucosa). If the substance is alkaline, take diluted vinegar (1:10 ratio) orally. If you carry SDS, seek medical attention immediately for a gastroscopy.

### 4.6 Most important symptoms and effects, both acute and delayed

Acute symptoms: skin redness, swelling, blisters, ulcers, severe eye pain, photophobia, blurred vision, oral/esophageal burns, and difficulty swallowing; long-term effects: skin scarring, corneal scarring (possibly causing blindness), and esophageal stenosis.

### 4.7 Protection of first-aiders

Rescuers must wear corrosion-resistant chemical protective clothing, chemical protective gloves (made of fluororubber), chemical goggles and masks; stand upwind when flushing to avoid inhaling volatile corrosive gases; after contact, equipment must be cleaned with a neutralizer and then rinsed with clean water.

## **4.8 Notes to physician**

Inform the doctor of the type of corrosive agent (acid/base), concentration, and duration of contact. Skin burns should be treated according to their depth (superficial II degree and above require skin grafting). Eye injuries should be checked for corneal epithelial integrity and, if necessary, corneal repair drugs (such as recombinant human epidermal growth factor) should be used.

# **5: Fire-fighting measures**

## **5.1 Unsuitable extinguishing media**

Spontaneous combustion substances: Do not use water or foam (which may intensify spontaneous combustion or cause explosion); Substances that release flammable gases when in contact with water: Do not use any water-containing fire extinguishing agents (such as spray water or foam), which may produce flammable gases such as hydrogen and acetylene.

## **5.2 Specific hazards during fire fighting**

Pyrophoric substances will spontaneously ignite when they come into contact with air, burn quickly, and can easily cause chain fires; substances that release gas when exposed to water react with water/humid air to release flammable gases, which can easily explode when the explosion limit is reached; some products are also toxic.

## **5.3 Hazardous combustion products**

Carbon monoxide, carbon oxides; substances that release gas when in contact with water may release additional hydrogen (explosive), phosphine (highly toxic), hydrogen sulfide (highly toxic), etc.

## **5.4 Specific extinguishing methods**

Cover small areas with dry powder/dry sand (to isolate the air), evacuate large areas, and allow the fire to burn (to avoid exacerbating the risk of improper fire extinguishing). For substances that release gas when exposed to water: cover the leak point with dry sand and soil, strictly prohibit contact with rain/humid environment, use dry powder to extinguish the fire (if it has already burned), and monitor the concentration of flammable gas at the same time.

## **5.5 Special protective equipment for fire-fighters**

Wear fireproof and chemical protective clothing, anti-static gloves, and positive pressure air respirator; carry a flammable gas detector (to measure explosion limits); wear waterproof boots when working with materials that release gas when exposed to water to avoid skin contact with leaks.

# **6: Accidental release measures**

## 6.1 Protective measures for workers

Wear fireproof protective clothing, chemical protective gloves (flame-resistant type), and a gas mask (with a flammable gas filter cartridge); if the substance releases gas when in contact with water, additional waterproof clothing and waterproof boots are required, and carry a dry powder fire extinguisher.

## 6.2 Environmental protection measure

Spontaneous combustion substances: prevent contact with air (to avoid spontaneous combustion), use dry powder to extinguish fire when burning (water is strictly prohibited); substances that release gas when exposed to water: set up waterproof cofferdams, strictly prohibit contact with rainwater/groundwater, and monitor gas concentration (to prevent explosion).

## 6.3 Containment methods for leaked chemicals

Spontaneous combustion substances: small amounts should be placed in sealed metal containers with nitrogen protection; large amounts should be covered with dry sand and transferred to inert gas storage facilities; substances that release gas when exposed to water: collect them in dry, corrosion-resistant containers and add desiccant (anhydrous calcium chloride).

## 6.4 Cleanup methods for chemical spills

Spontaneous combustion materials: Use spark-free tools to transfer in a dry environment to avoid oxygen enrichment; Materials that release gas when exposed to water: After being absorbed by dry sand and soil, transfer in a water-free environment. Handling in rainy days is strictly prohibited.

## 6.5 Measures to prevent the spread of leaks

Designate a 20-meter isolation zone and prohibit entry of water or wet items; set up waterproof trenches for materials that release gas when exposed to water; strengthen ventilation (explosion-proof fans) to prevent flammable gases from reaching explosion limits.

## 6.6 Container leakage treatment

Minor leaks: seal with dry sealant; serious leaks: evacuate immediately, prevent pyrophoric substances from self-igniting, keep substances that release gas when in contact with water away from water sources, and notify a professional team to handle the situation.

## 6.7 Special considerations

Spontaneous combustion substances must continuously monitor the temperature (to prevent self-heating); substances that release gas when in contact with water must not be rinsed with water; in case of skin contact, wipe with a dry cloth and then clean with a neutral detergent; containers must be dried and tested before being discarded.

# 7: Handling and storage

## 7.1 Safe storage conditions

Store in a corrosion-resistant warehouse (the floor is epoxy resin coated, and the walls are acid/alkali-resistant tiles); the container is made of corrosion-resistant material (glass fiber reinforced plastic for acid corrosion, high-density polyethylene for alkaline corrosion), with a capacity of ?200L to prevent dumping; the warehouse is equipped with an emergency neutralization tank (volume ?5m<sup>3</sup>) and equipped with acid/alkali neutralizers (such as sodium carbonate, dilute acetic acid).

## 7.2 Storage precautions

Store them separately from materials that may come into contact with the skin (such as clothing and gloves) to avoid cross contamination. Use a corrosion-resistant forklift to transport containers and avoid impact. Check the humidity in the warehouse daily (>65%) to prevent moisture from exacerbating corrosion. In case of leakage, immediately absorb it with inert materials (such as sand) and then treat it with a neutralizer.

## 7.3 VCI Storage Grade

Level 2 (medium-high): Metal pipes and valves are coated with VCI anti-rust paint (acid/alkali resistant type) and maintained once every six months; VCI anti-rust blocks (such as urethane) are placed in the warehouse and replenished once every quarter to prevent corrosion of metal parts.

## 7.4 Recommended storage temperature

5-35°, avoid sudden temperature changes (such as moving directly from a low temperature environment to a high temperature environment); concentrated acids/bases must be kept at a temperature >30° to prevent temperature increases from causing increased container pressure; in winter, they must be protected from freezing (temperature >5°) to prevent the solution from freezing and cracking the container (if the label has a recommended storage temperature, follow the label).

## 7.5 Handling

For precautions see Safety Data Sheet section 2

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

# 8: Exposure controls/personal protection

## 8.1 Respiratory protection

When exposed to corrosive vapors (such as hydrochloric acid mist and sulfuric acid mist), wear a powered air-purifying respirator (APF>50); in high-concentration environments, a positive pressure air respirator is required to avoid inhalation burns to the respiratory tract.

## 8.2 Recommended Filter type

For acidic corrosive substances, choose Type E filter cartridge (protects against acidic gases such as SO<sub>2</sub> and HCl); for alkaline corrosive substances, choose Type K filter cartridge (protects against ammonia and amines); if the product contains dust, add Type P2 filter cotton.

## 8.3 Eye/face protection

Wear chemical protective goggles + full-face mask. The mask must cover the chin. The lens should be made of polycarbonate (corrosion-resistant and impact-resistant). Check the sealing regularly.

## 8.4 Skin and body protection

Wear corrosion-resistant chemical protective clothing made of fluororubber or polytetrafluoroethylene (PTFE) to avoid direct skin contact; wear an apron (of the same material) with protection covering the chest to the knees.

## 8.5 Hand protection

Wear corrosion-resistant gloves. For acid corrosion, choose neoprene material; for alkaline corrosion, choose nitrile rubber material. The thickness of the gloves should be  $\geq 0.5$ mm. Perform a water leakage test before use.

## 8.6 Hygiene measures

Immediately after the operation, rinse the skin with running water for 10 minutes. If there is stinging at the contact site, apply a neutralizer (5% sodium bicarbonate for acid and 1% acetic acid for alkali) for 5 minutes. Do not use irritating skin care products to avoid aggravating skin damage.

## 9: Physical and chemical properties and safety characteristics

<b>Physical state</b>	no data available
<b>Colour</b>	no data available
<b>Odour</b>	no data available
<b>Melting point/freezing point</b>	-20°C
<b>Boiling point or initial boiling point and boiling range</b>	128°C
<b>Flammability</b>	no data available
<b>Lower and upper explosion limit/flammability limit</b>	no data available
<b>Flash point</b>	12°C
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	no data available
<b>Partition coefficient n-octanol/water</b>	no data available
<b>Vapour pressure</b>	no data available
<b>Density and/or relative density</b>	1.026
<b>Relative vapour density</b>	no data available
<b>Particle characteristics</b>	no data available

## **10: Stability and reactivity**

### **10.1 Reactivity**

no data available.

### **10.2 Chemical stability**

no data available.

### **10.3 Possibility of hazardous reactions**

no data available.

### **10.4 Conditions to avoid**

no data available.

### **10.5 Incompatible materials**

no data available.

### **10.6 Hazardous decomposition products**

no data available.

## **11: Toxicological information**

### **11.1 Acute toxicity**

no data available

### **11.2 Skin corrosion/irritation**

no data available

### **11.3 Serious eye damage/irritation**

no data available

### **11.4 Respiratory or skin sensitization**

no data available

### **11.5 Germ cell mutagenicity**

no data available

### **11.6 Carcinogenicity**

no data available

### **11.7 Reproductive toxicity**

no data available

## **11.8 STOT-single exposure**

no data available

## **11.9 STOT-repeated exposure**

no data available

## **11.10 Aspiration hazard**

no data available

# **12: Ecological information**

## **12.1 Toxicity**

no data available

## **12.2 Persistence and degradability**

no data available

## **12.3 Bioaccumulative potential**

no data available

## **12.4 Mobility in soil**

no data available

## **12.5 Other adverse effects**

no data available

# **13: Disposal considerations**

## **13.1 Disposal methods for waste chemicals**

Acidic corrosives can be treated with alkaline neutralizers (such as sodium carbonate) until neutralized and then disposed of as ordinary waste. Alkaline corrosives can be treated with acidic neutralizers (such as dilute hydrochloric acid) until neutralized and then disposed of. Those that cannot be neutralized must be incinerated at high temperature or chemically decomposed by a professional unit. The container must be thoroughly cleaned before being disposed of.

## **13.2 Precautions**

Neutralization reactions must be conducted in well-ventilated, dedicated facilities, with the reaction rate controlled to prevent splashing. Disposal personnel must wear corrosion-resistant protective gear. The pH value of the neutralized waste must be controlled between 6 and 9. Direct disposal of unneutralized corrosive materials is prohibited. Emergency pools must be established at the disposal site to prevent leakage and contamination.

## 14: Transport information

### 14.1 UN Number

ADR/RID: 3398

IMDG: 3398

IATA: 3398

### 14.2 UN Proper Shipping Name

ADR/RID: no data available

IMDG: no data available

IATA: no data available

### 14.3 Transport hazard class(es)

ADR/RID: 4.3

IMDG: 4.3

IATA: 4.3

### 14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

### 14.5 Environmental hazards

ADR/RID: no data available

IMDG: no data available

IATA: no data available

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to IMO instruments

no data available

## 15: Regulatory information

### 15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Tetrakis(diethylamino)zirconium	Tetrakis(diethylamino)zirconium	13801-49-5	625-460-5
Australian Inventory of Industrial Chemicals (AIIC)			Not Listed.
Catalogue of Strictly Restricted Toxic Chemicals in China			Not Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
European INventory of Existing Commercial chemical Substances			Not Listed.
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans			Not Listed.
TSCA Inventory of Chemical Substances			Not Listed.

## 16: Other information

## Information on revision

SDS Creation Date July 1, 2025

SDS Revision Date July 1, 2025

## Abbreviations and acronyms in SDS

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

## SDS References

- IPCS - The International Chemical Safety Cards (ICSC), website:  
<http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:  
[http://www.echemportal.org/echemportal/index?pageID=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en)
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:  
<http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

**Any questions regarding this Safety Data Sheet, Please send your inquiry to [sales@MolBest.com](mailto:sales@MolBest.com)**

---

*Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.*