



<a href="#">Bis(cyclopentadienyl)zirconium(IV) bis(trifluoromethanesulfonate)tetrahydrofuran complex</a>		<a href="#">Pricing &gt;</a>
<a href="#">Zirconium Trifluoromethanesulfonate</a>		<a href="#">Pricing &gt;</a>
Linear Formula	C <sub>10</sub> H <sub>10</sub> F <sub>6</sub> O <sub>4</sub> S <sub>2</sub> Zr · C <sub>4</sub> H <sub>8</sub> O	
Pubchem CID	16212672	
MDL Number	MFCD00192583	
EC No.	N/A	
IUPAC Name	cyclopentane; oxolane; trifluoromethanesulfonate; zirconium(2+)	
Beilstein/Reaxys No.	N/A	
SMILES	C1CCOC1.[CH]1[CH][CH][CH]1.[CH]1[CH][CH][CH]1.C(F)(F)S(=O)(=O)[O-].C(F)(F)S(=O)(=O)[O-].[Zr+2]	
Inchi Identifier	InChI=1S/2C5H5.C4H8O.2CHF3O3S.Zr/c3*1-2-4-5-3-1;2*2-1(3,4)8(5,6)7/h2*1-5H;1-4H2;2*(H,5,6,7)/q;::;+2/p-2	
Inchi Key	OFTAVORSNHLQHT-UHFFFAOYSA-L	
Signal Word	Warning	
Hazard Statements	H315-H319-H335	
Hazard Codes	Xi	
Risk Codes	36/37/38	
Safety Statements	16-26-36	
RTECS Number	N/A	
Transport Information	N/A	
WGK Germany	3	
GHS Pictograms	<a href="#">GHS07 Exclamation Point</a>  <a href="#">GHS02 Flame</a> 	

[Create Printable PDF](#)

## SAFETY DATA SHEET

Date Accessed: 05/14/2024

Date Revised: 01/15/2022

### SECTION 1. IDENTIFICATION

**Product Identifiers:** All applicable American Elements product codes for CAS #89672-77-5

**Relevant identified uses of the substance:**

Scientific research and development

Supplier details:

American Elements

10884 Weyburn Ave.

Los Angeles, CA 90024

Tel: +1 310-208-0551

Fax: +1 310-208-0351

Emergency telephone number:

Domestic, North America +1 800-424-9300

International +1 703-527-3887

---

## SECTION 2. HAZARDS IDENTIFICATION

OSHA Haz Com: CFR 1910.1200: Skin

Corrosion/Irritation [Category 2]

Eye Damage/Irritation [Category 2A]

Flammable Solids [Category 2]

Signal word: Warning!

Hazard Statement(s): Causes serious eye irritation

Causes skin irritation

Flammable solid



Pictogram(s) or Symbol(s):

Precautionary Statement(s):

[Prevention] Wash hands and face thoroughly after handling. Wear protective gloves. Wear eye and face protection.

Keep away from heat, sparks, open flames or other hot surfaces. - No smoking. Ground or bond container and receiving equipment. Use explosion-proof electrical, ventilating, lighting, and equipment. Wear protective gloves, eye protection and face protection. [Response] If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Take off

contaminated clothing and wash it before reuse. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice or attention. In case of fire: Use dry chemical, CO<sub>2</sub>, sand, earth, water spray or regular foam to extinguish.

[Storage] None

[Disposal] None

---

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture: Substance  
Components: Zirconocene  
Bis(trifluoromethanesulfonate) Tetrahydrofuran  
Adduct  
Percent: >97.0%(T)  
CAS Number: 89672-77-5  
Molecular Weight: 591.65  
Chemical Formula: C<sub>16</sub>H<sub>18</sub>F<sub>6</sub>O<sub>7</sub>S<sub>2</sub>Zr  
Synonyms: Bis(cyclopentadienyl)zirconium  
Bis(trifluoromethanesulfonate) Tetrahydrofuran  
Adduct , Zirconocene  
Bis(triflate) Tetrahydrofuran Adduct

---

### SECTION 4. FIRST AID MEASURES

Inhalation: Call emergency medical service. Move victim to fresh air. Give artificial respiration if victim is not breathing.

Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Skin contact: Call a poison center or doctor if you feel unwell. Remove and wash contaminated clothing before re-use. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Eye contact: IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open.

Contact with material may irritate or burn eyes. Call emergency medical service. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of

exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Ingestion: Do not induce vomiting without medical advice. If swallowed, seek medical advice immediately and show the container or label. Do not use mouth-to-mouth method if victim ingested the substance; give artificial

respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Symptoms/effects:

Acute: Redness.

Delayed: No data available

Immediate medical attention: If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

---

## **SECTION 5. FIREFIGHTING MEASURES**

Suitable extinguishing media: Dry chemical, CO<sub>2</sub>, sand, earth, water spray or regular foam Consult with local fire authorities before

attempting large scale fire fighting operations.

Specific hazards arising from the chemical

Hazardous combustion products: These products include: Carbon oxides Halogenated compounds Silicates Metallic oxides

Other specific hazards: WARNING: Highly toxic HF gas is produced during combustion.

Special precautions for fire-fighters:

Use water spray or fog; do not use straight streams.

Dike fire-control water for later disposal; do not scatter the material. May re-ignite after fire is extinguished. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Move containers from fire area if you can do it without risk.

Special protective equipment for fire-fighters:

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

---

## **SECTION 6. ACCIDENTAL RELEASE**

## MEASURES

Personal precautions: Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Use sparkproof tools and explosion-proof equipment. Remove all sources of ignition. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation.

Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Personal protective equipment: Wear eye protection (splash goggles) and face protection (full length face shield). Lab coat. Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).

Emergency procedures: Prevent dust cloud.

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in the immediate area). Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

Methods and materials for containment and cleaning up:

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). All equipment used when handling the product must be grounded. Stop leak if without risk. Ventilate the area. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material.

Environmental precautions:

Prevent further leakage or spillage if safe to do so.

Water runoff can cause environmental damage.

Prevent entry into sewers, basements or confined areas; dike if needed.

---

## SECTION 7. HANDLING AND STORAGE

Precautions for safe handling: Avoid inhalation of vapor or mist. Avoid contact with skin and eyes. Avoid mechanical shock and friction.

Avoid formation of dust and aerosols. Keep away from heat and sources of ignition. Use explosion-proof equipment. Use only non-sparking hand tool when handling this product. Ground all equipment

containing material. Take measures to prevent build up of electrostatic charge. Good general ventilation should be sufficient to control airborne levels. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition. Conditions for safe storage: Keep containers tightly closed in a cool, well-ventilated place. Keep away from sources of ignition. Store and use away from heat, sparks, open flame, or any other ignition source. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods. Store under inert gas (e.g. Argon). Hygroscopic material, store in a tightly sealed container. Storage incompatibilities: Store away from oxidizing agents

---

## **SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Exposure limits: No data available  
Appropriate engineering controls:  
Good general ventilation should be sufficient to control airborne levels. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.  
Personal protective equipment  
Respiratory protection: Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.  
Hand protection: Wear protective gloves.  
Eye protection: Safety glasses.  
Skin and body protection: Lab coat.

---

## **SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

Physical state (20°C): Solid  
Form: Crystal - Powder  
Color: Pale yellow - Grayish yellow red  
Odor: No data available  
Odor threshold: No data available

Melting point/freezing point: No data available  
Boiling point/range: No data available  
Decomposition temperature: No data available  
Relative density: No data available  
Kinematic Viscosity: No data available  
Partition coefficient: No data available  
n-octanol/water (log Pow)  
Flash point: 79°C (174°F)  
Flammability (solid, gas): No data available

pH: No data available  
Vapor pressure: No data available  
Vapor density: No data available  
Dynamic Viscosity: No data available  
Evaporation rate: No data available  
(Butyl Acetate = 1)  
Autoignition temperature: No data available  
Flammability or explosive limits: No data available  
Lower: No data available  
Upper: No data available

Solubility(ies):

---

## **SECTION 10. STABILITY AND REACTIVITY**

Reactivity: Not Available.  
Chemical Stability: Stable under recommended storage conditions. (See Section 7)  
Possibility of Hazardous Reactions: No hazardous reactivity has been reported.  
Conditions to avoid: Avoid excessive heat and light.  
Incompatible materials: Acids, Alkali, Bases, Oxidizing agents  
Hazardous Decomposition Products: No data available

---

## **SECTION 11. TOXICOLOGICAL INFORMATION**

Acute Toxicity:  
No data available  
Skin corrosion/irritation:  
No data available  
Serious eye damage/irritation:  
No data available  
Respiratory or skin sensitization:  
No data available  
Germ cell mutagenicity:  
No data available  
Carcinogenicity:  
No data available  
IARC: No data available

NTP: No data available  
OSHA: No data available  
Reproductive toxicity:  
No data available  
Routes of Exposure: Inhalation, Eye contact,  
Ingestion, Skin contact.  
Symptoms related to exposure:  
Skin contact may result in inflammation; characterized  
by itching, scaling, reddening, or occasionally  
blistering. Skin contact may result in redness, pain  
or dry skin. Eye contact may result in redness or pain.  
Potential Health Effects:  
Skin and eye contact may result in irritation.  
Target organ(s): No data available

---

## **SECTION 12. ECOLOGICAL INFORMATION**

Ecotoxicity  
Fish: No data available  
Crustacea: No data available  
Algae: No data available  
Persistence and degradability: No data available  
Bioaccumulative potential (BCF): No data available  
Mobility in soil: No data available  
Partition coefficient:  
n-octanol/water (log Pow)  
No data available  
Soil adsorption (Koc): No data available  
Henry's Law:  
constant (PaM<sup>3</sup>/mol)  
No data available

---

## **SECTION 13. DISPOSAL CONSIDERATIONS**

Disposal of product: Recycle to process if possible. It  
is the generator's responsibility to comply with  
Federal, State and Local  
rules and regulations. You may be able to dissolve or  
mix material with a combustible solvent and burn in a  
chemical incinerator equipped with an afterburner and  
scrubber system. This section is intended to provide  
assistance but does not replace these laws, nor does  
compliance in accordance with this section ensure  
regulatory compliance according to the law. US EPA  
guidelines for Identification and Listing of Hazardous  
Waste are listed in 40 CFR Parts 261. The product  
should not be allowed to enter the environment,  
drains,  
water ways, or the soil.  
Disposal of container: Dispose of as unused product.

Do not re-use empty containers.  
Other considerations: Observe all federal, state and local regulations when disposing of the substance.

---

## **SECTION 14. TRANSPORT INFORMATION**

DOT (US)  
UN number:  
UN1325  
Proper Shipping Name:  
Flammable solids, organic, n.o.s.  
Class or Division:  
4.1 Flammable solid  
Packing Group:  
III  
IATA  
UN number:  
UN1325  
Proper Shipping Name:  
Flammable solids, organic, n.o.s.  
Class or Division:  
4.1 Flammable solid  
Packing Group:  
III  
IMDG  
UN number:  
UN1325  
Proper Shipping Name:  
Flammable solids, organic, n.o.s.  
Class or Division:  
4.1 Flammable solid  
Packing Group:  
III  
EmS number: F-A, S-G

---

## **SECTION 15. REGULATORY INFORMATION**

Toxic Substance Control Act (TSCA 8b.):  
This product is NOT on the EPA Toxic Substances Control Act (TSCA) inventory. The following notices are required by 40 CFR 720.36 (C) for those products not on the inventory list:  
(i) These products are supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR 720.0 et sec.  
(ii) The health risks of these products have not been fully determined. Any information that is or becomes available will be supplied on a SDS sheet.

US Federal Regulations  
CERCLA Hazardous substance and Reportable  
Quantity:  
SARA 313: Not Listed  
SARA 302: Not Listed  
State Regulations  
State Right-to-Know  
Massachusetts Not Listed  
New Jersey Not Listed  
Pennsylvania Not Listed  
California Proposition 65: Not Listed  
Other Information  
NFPA Rating:  
Health: 3  
Flammability: 2  
Instability: 0  
HMIS Classification:  
Health: 3  
Flammability: 2  
Physical: 0  
International Inventories  
International Inventories  
WHMIS hazard class: B4: Flammable Solid.  
D2B: Materials causing other toxic effects. (Toxic)

---

## 16. OTHER INFORMATION

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH). 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. American Elements 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 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.

---