

## 1: Identification of substance / mixture

### 1. Product Identifier

Mixture

Product Name **4-Cyanobutylzinc bromide, Tetrahydrofuran**  
Product Code 2008  
CAS Number 226570-68-9  
Other Names 4-Cyanobutylzinc bromide 0.5 M in Tetrahydrofuran  
IUPAC  
MFCD Number MFCD01316996  
EC/EINECS  
REACH Number

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

Research and Development.

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

Rieke Metals, LLC  
1001 Kingbird Road,  
Lincoln  
Nebraska  
68521  
US

Telephone: 402 434 2775  
Fax: 402 434 2777  
Email: sales@riekemetals.com



### 4. Emergency telephone number

800-535-5053 / International 1-352-323-3500 -

## 2. Hazards Identification

### 1. Classification of the substance or mixture

H225	Flam Liq. 2
H261	Water-react. 3
H302	Acute Tox. 4
H313	Acute Tox. 5
H316	Skin Irrit. 3
H318	Eye Dam. 1
H335	STOT SE 3a
H336	STOT SE 3b

### 2. Label elements

Signal Word **Danger**



### Hazard Statements

H225	Highly flammable liquid and vapour.
H261	In contact with water releases flammable gases.
H302	Harmful if swallowed.
H313	Maybe harmful in contact with skin
H316	Causes mild skin irritation
H318	Causes serious eye damage.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.

### Precautionary Phrases

P210	Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P231 + P232	Handle under inert gas. Protect from moisture.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.

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.
P501	Dispose of contents/container to licensed professional waste disposal service to dispose of this material.

### 3. Other Hazards

Additional precautionary phrases are located throughout the safety data sheet

## 3. Composition / Information on Ingredients

### 1. Substances

No Resource File

### 2. Mixtures

Concentration	Product Name	CAS Number	EC/EINECS
70-90%	Tetrahydrofuran	109-99-9	203-726-8
10-30%	4-Cyanobutylzinc bromide	226570-68-9	

## 4. First Aid Measures

### 1. Description of first aid measures

<i>Skin Contact</i>	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.
<i>Eye Contact</i>	P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Rinse opened eye for several minutes under running water. Consult a physician.
<i>Ingestion</i>	Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
<i>Inhalation</i>	Move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

### 2. Most important symptoms and effects

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

### 3. Indication of any immediate medical attention

P310: Immediately call a POISON CENTER or doctor/physician.

## 5. Firefighting measures

### 1. Extinguishing Media

<i>Suitable</i>	Dry chemical powder, Carbon dioxide, or Appropriate foam.
<i>Unsuitable</i>	Do not use water.

### 2. Special Hazards arising from the substance or mixture

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides, Hydrogen halides, and Zinc oxides.

### 3. Advice for Fire Fighters

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

## 6. Accidental Release Measures

### 1. Personal Precautions

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

### 2. Environmental Precautions

Prevent further leakage or spillage if safe to do so.  
Do not let product enter drains.

### 3. Methods & Materials

Contain spillage, absorb into dry earth or sand. and then transfer to a closable, labelled salvage container for disposal by an appropriate method. Do not flush with water.

### 4. Preventing the occurrence of secondary hazards.

No data available

## 7. Handling and Storage

### 1. Personal Precautions

<i>Safe Handling</i>	Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge
<i>Protection against explosions and fires</i>	Keep away from sources of ignition - No smoking.

### 2. Conditions for safe storage, including any incompatibilities

<i>Managing Storage Risks</i>	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Never allow product to get in contact with water during storage. Recommended storage temperature: 2 - 8 °C Store under inert atmosphere. Air sensitive.
<i>Storage Controls</i>	No special requirements
<i>Maintaining Integrity</i>	P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P231 + P232: Handle under inert gas. Protect from moisture.
<i>Other advice</i>	No further information available.

### 3. Specific End Uses

The end use(s) have not been fully determined. The substance is supplied for Research and Development purposes by professionals only.

## 8. Exposure Controls/Personal Protection

### 1. Control Parameters

No Data Available

## 2. Exposure Controls

### General protective and hygiene measures

P280: Wear protective gloves/protective clothing/eye protection/face protection.  
The standard precautionary measures should be adhered to when handling  
Avoid contact with skin and eyes

### Engineering measures

Ensure there is exhaust ventilation of the area.  
Use only in a chemical fume hood.

### Eye / Face Protection

Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

### Hand protection

Handle with protective 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.

### Respiratory protection

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.  
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) 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 GEN (EU).

### Skin protection

Protective clothing, antistatic.  
The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Other personal protection advice No data available

## 9. Physical and Chemical Properties

### 1. Physical and Chemical Properties

Appearance	Brown to Black colored solution
Odour	No Data Available
Odour threshold	No Data Available
PH	No Data Available
Melting point / Freezing point	No Data Available
Initial boiling point and boiling range	No Data Available
Flash point	-17.2 °C (1.0 °F)
Evaporation rate	No Data Available
Flammability(solid,gas)	No Data Available
Upper/lower flammability or explosive limits	No Data Available
Vapour pressure	No Data Available
Vapour density	No Data Available
Relative density	0.97 g/mL
Solubility(ies):	No Data Available
Partition coefficient: n-octanol/water	No Data Available
Auto-ignition temperature	No Data Available
Decomposition temperature	No Data Available
Viscosity	No Data Available
Explosive properties	No Data Available
Oxidising properties	No Data Available

### 2. Other Information

227.40 g/mol  
C5H8BrNZn

## 10. Stability and Reactivity

### 1. Reactivity

Reacts with aqueous media to form Valeronitrile.

### 2. Stability

Stable under recommended storage conditions.  
Store at 2-8°C under Argon or Nitrogen atmosphere.

### 3. Possibility of Hazardous Reactions

No data Available.

### 4. Conditions to Avoid

Heat, flames and sparks. Extremes of temperature and direct sunlight. Exposure to moisture.

### 5. Incompatible Materials

Oxidizing agents, Strong oxidizing agents, Oxygen.

### 6. Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions.

Carbon oxides, nitrogen oxides (NOx), Hydrogen

Halides, Zinc oxides

Other decomposition products - no data available

## 11. Toxicology information

### 1. Information

<i>Acute Toxicity</i>	No data available
<i>Skin corrosion/irritation</i>	No data available
<i>Serious eye Damage/irritation</i>	No data available
<i>Respiratory or skin sensitisation</i>	No data available
<i>Germ Cell mutagenicity</i>	No data available
<i>Carcinogenicity</i>	No data available
<i>Reproductive toxicity</i>	No data available
<i>STOT-single exposure</i>	No data available
<i>STOT-repeated exposure</i>	No data available
<i>Aspiration hazard</i>	No data available

### 2. Additional

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.  
No additional information available.

## 12. Ecological Information

### 1. Toxicity

No data available

### 2. Persistence and degradability

No data available

### 3. Bio-Accumulative Potential

No data available

### 4. Mobility and Soil

No data available

### 5. Results of PBT & vPvB assessment

No data available

### 6. Other adverse effects

No data available

## 13. Disposal Considerations


### 1. Waste Treatment Methods

*Disposal Operations*


*Disposal of Packaging* Disposal must be made according to official regulations.

## 14. Transport Information


## Air (ICAO)

1. **UN Number:** 1993
2. **Shipping Name:** Flammable liquid, n.o.s. (4-Cyanobutylzinc bromide, Tetrahydrofuran)
3. **Transport hazard class(es):** : 3 Sub Class :
- 
4. **Packing group:** II
5. **Environmental hazards:**
6. **Special Precautions for user:**
7. **Transport in bulk:**

## Road (ADR)

1. **UN Number:** 1993
2. **Shipping Name:** FLAMMABLE LIQUID, N.O.S. (vapour pressure at 50 °C not more than 110 kPa)
3. **Transport hazard class(es):** : 3 Sub Class :
- 
4. **Packing group:** II
5. **Environmental hazards:**
6. **Special Precautions for user:** For the purposes of documentation and package marking, the Proper Shipping Name shall be supplemented with the technical name (see 3.1.2.8.1).
7. **Transport in bulk:**

## Sea (IMDG)

1. **UN Number:** 1993
2. **Shipping Name:** Flammable liquid, n.o.s. (4-Cyanobutylzinc bromide, Tetrahydrofuran)
3. **Transport hazard class(es):** : 3 Sub Class :
- 
4. **Packing group:** II
5. **Environmental hazards:**
6. **Special Precautions for user:** This substance, when containing less alcohol, water or phlegmatizer than specified, shall not be transported, unless specifically authorized by the competent authority.
7. **Transport in bulk:** IBCINS: IBC02  
  
UNTANKINS: T7  
TANKPROV: TP1 TP8 TP28

## 15. Safety, health, environmental and national regulations

### 1. Safety, health, environmental and national regulations:

## OSHA Hazards

Flammable Liquid, Water Reactive ,Target Organ Effect, Harmful by ingestion. Irritant, Carcinogen

## SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

## SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

## SARA 311/312 Hazards

Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

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## 2. Safety Assessment

No Chemical Safety Assessment

## 16. Other Information

### 1. Other Information:

IATA: International Air Transport Association

IMDG: International Maritime Code for Dangerous Goods

ICAO-TI: Technical Instructions by the ICAO

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

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### 3. 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 or fitness for a particular use. Rieke Metals, LLC shall not be held liable for any damage resulting from handling or from contact with the above product.

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