



11555 Medlock Bridge Road, Suite 100, Johns Creek, GA 30097, USA

T: +1.888.658.1221 F: 1.678.619.2020

E: info@ereztech.com W: https://ereztech.com

SAFETY DATA SHEET

Section 1. Identification

Cobalt tricarbonyl nitrosyl **Product Name:**

Liquid **Product Type:**

CAS Number: 14096-82-3 **Product Number:** CO6823

Product Manufacturer: Ereztech LLC

11555 Medlock Bridge Road, Suite 100

Johns Creek, GA 30097

(888) 658-1221 **Product Information:**

In Case of an Emergency: CHEMTREC: 1-800-424-9300 (USA);

> +1 703-527-3887 (International); CCN836180 *** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Appearance/Odor: Dark red liquid, musty/acrid unpleasant odor.

FLAMMABLE LIQUIDS - Category 2, H225 Classification: ACUTE TOXICITY, ORAL - Category 3, H301

SENSITIZATION, SKIN - Category 1, H317

ACUTE TOXICITY, INHALATION - Category 2, H330 CARCINOGENICITY - Category 2, H351

GHS Label Elements

Hazard Pictograms:



DANGER Signal Word:

Hazard Statements: H225: Highly flammable liquid and vapor.

H301: Toxic if swallowed.

H317: May cause an allergic skin reaction.

H330: Fatal if inhaled.

H351: Suspected of causing cancer.

Section 2. Hazards Identification

Precautionary Statements

General:

Prevention:

Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

P201: Obtain special instructions before use.

P202: Do not handle until all safety precautions have been read and understood.

P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P233: Keep container tightly closed.

P240: Ground/Bond container and receiving equipment.

P241: Use explosion-proof electrical/ventilating/lighting/handling equipment.

P242: Use only non-sparking tools.

P243: Take precautionary measures against static discharge.

P260: Do not breathe sprays/mists/vapors/gases.

P264: Wash exposed skin thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P272: Contaminated work clothing should not be allowed out of the workplace.

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

P281: Use personal protective equipment as required.

P284: Wear respiratory protection.

P301 + P310: IF SWALLOWED; immediately call a POISON CENTER or doctor/physician.

P302 + P352: IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P308 + P313: IF exposed or concerned: Get medical advice/attention.

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

P330: Rinse mouth.

P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

P363: Wash contaminated clothing before reuse.

P370 + P378: In case of a fire: Use sand, dry chemical, water spray (fog), alcohol resistant foam or carbon dioxide for extinction.

P403 + P233 + P235: Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Response:

Storage:

Section 2. Hazards Identification

Storage (cont.): P405: Store locked up.

P501: Dispose of contents/ container to an approved wasted Disposal:

disposal plant.

This material is considered hazardous by the OSHA Hazard **OSHA/HCS Status:**

Communication Standard (29 CFR 1910.1200).

Hazards Not Otherwise Classified [HNOC]:

None identified.

Section 3. Composition/Information on Ingredients

: C₃CoNO₄ **Formula Molecular Weight** : 172.97 : 14096-82-3. CAS-No.

Ingredient Name	%	CAS Number
Cobalt tricarbonyl nitrosyl	≥ 98	14096-82-3

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of Necessary First Aid Measures

Move out of dangerous area. Call a POISON CENTER or doctor/physician **General Advice:**

immediately upon exposure. Show this safety data sheet to the doctor in

attendance.

Immediately flush eyes with plenty of water, occasionally lifting the upper and **Eye Contact:**

lower eyelids. Check for and remove any contact lenses. Continue rinsing. Call

a POISON CENTER or doctor/physician immediately.

Skin Contact: Take off contaminated clothing and shoes immediately. Wash off contaminated

> skin with soap and plenty of water. In the event of complaints or symptoms, avoid further exposure. Call a POISON CENTER or doctor/physician immediately.

Remove victim to fresh air and keep at rest in a position comfortable for Inhalation:

breathing. Rescuer should wear a mask or self-contained breathing apparatus if

it is suspected that fumes are still present. If not breathing, if breathing is

irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give

mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing

such as a collar, tie, belt or waistband. Call a POISON CENTER or

doctor/physician immediately.

Section 4. First Aid Measures

Inhalation: In the case of inhalation of decomposition products from a fire, symptoms may

be delayed. The exposed person may need to be kept under medical surveillance (cont.)

for 48 hours.

Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting Ingestion:

> occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a

POISON CENTER or doctor/physician immediately.

Most Important Symptoms/Effects, Acute and Delayed Potential Acute Health Effects

Symptoms may include stinging, tearing, redness, swelling and blurred vision. **Eye Contact:**

Fatal if inhaled. Exposure to decomposition products may cause a health hazard. Inhalation:

Serious effects may be delayed following exposure. Symptoms may include

dizziness, difficulty breathing, nausea, headache, vomiting.

Product may cause an allergic skin reaction. Repeated exposure may cause Skin Contact:

> allergic dermatitis. Symptoms may include an itching or burning sensation, reddening, rash, swelling, trouble breathing, tingling of hands and feet,

dizziness, lightheadedness, chest pain, muscle pain or flushing.

Ingestion: Toxic if swallowed. Ingestion of significant amounts of cobalt containing

compounds has been reported to have potential for causing blood, heart, thyroid

and pancreatic damage. Symptoms may include cramping, localized pain,

headache, nausea, diarrhea and vomiting.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

Notes to Physician: Treat symptomatically. In the case of inhalation of

> decomposition products from a fire, symptoms may be delayed. The exposed person may need to be kept under

medical surveillance for 48 hours.

Specific Treatments: No specific treatment.

Protection of First Responders: No action taken shall be taken involving any personal risk

> without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See Toxicological Information (Section 11)

Section 5. Fire Fighting Measures

Highly flammable liquid and vapors. **General Hazards:**

Section 5. Fire Fighting Measures

THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY Suitable Extinguishing Media:

> CHEMICAL POWDER PRESURIZED WITH NITROGEN. Water spray (fog), alcohol-resistant foam, or carbon dioxide (CO₂)

may also be used as an extinguishing agent.

Unsuitable Extinguishing Media:

Unusual Fire and Explosion Hazards:

Product of Combustion:

Protection of Firefighters:

Do not use high pressure water streams.

Vapor/air mixtures are explosive above flash point. Product

runoff to sewer may create a fire or explosion hazard. Vapors/gases released under fire conditions are heavier than

air and may spread long distances along the ground. Vapors

may accumulate in low or confined areas or travel a considerable distance to an ignition source and flashback.

Containers may explode when heated.

Carbon oxides (CO_x) , nitrogen oxides (NO_x) and cobalt oxides. Irritating fumes and organic acid vapors may be generated during exposure to elevated temperatures or open flame.

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Avoid contact with skin or eyes. Do not breathe sprays,

mists, vapors and gases.

Eliminate all local and distant ignition sources. Move containers from fire area if process can be accomplished without risk to firefighters. To reduce the possibility of explosion, use a water spray or fog to reduce direct vapors and to cool unopened containers. Do not cut, grind, drill or weld on or near product containers (even empty) of this product because an explosion may result.

Fire-fighters must wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

For Non-Emergency Personnel:

No action shall be taken involving any personal risk or without suitable training. Remove all ignition sources. Use special care to avoid static electricity discharges. Use only non-sparking tools and equipment. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid inhalation of sprays, mists, vapors and gases. Provide adequate ventilation.

Section 6. Accidental Release Measures

For Non-Emergency Personnel: Wear respiratory protection. Put on appropriate personal

protective equipment.

For Emergency Responders: If specialized clothing is required to deal with the spillage, take

note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For Non-Emergency

Personnel".

Environmental Precautions: Do not allow dispersal of spilled material and contact with soil,

waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers,

waterways, soil or air).

Methods for Containment

General: Eliminate all local and distant ignition sources. Move containers

from spill area if safe to do so. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may

pose the same hazard as the spilled product.

Small Spill: Contain and collect spillage with a dry, non-combustible

absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in dry, sealed container for

disposal according to local regulations (see Section 13).

Large Spill: Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and

collect spillage with a dry, non-combustible absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place

in dry, sealed container for disposal according to local

regulations (see Section 13).

Note: see Section 1 for emergency contact information and

Section 13 for waste disposal.

Section 7. Handling and Storage

Precautions: Product is air/moisture sensitive; handle under a dry, inert gas.

Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep away from all sources of ignition – NO SMOKING. Keep container tightly sealed. Avoid contact with skin, eyes and clothing. Avoid the formation and inhalation of sprays, mists, vapors and gases. Do not ingest or inhale. Avoid prolonged exposure. Ensure adequate ventilation.

Section 7. Handling and Storage

Protective Measures:

Protect against electrostatic charges. Use explosion-proof electrical/ventilating/lighting/handling equipment. Use only non-sparking tools and equipment. Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid the formation and inhalation of sprays, mists, vapors and gases. Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

General Occupational Hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking or smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions:

Product is air/moisture sensitive; store under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Store refrigerated at 2 – 8 °C. Keep away from all sources of ignition – NO SMOKING. Store in original container protected from direct sunlight in a dry and wellventilated area, away from incompatible materials and food and drink. Keep container tightly closed and sealed until ready for use. Store locked up.

Section 8. Exposure Controls/Personal Protection

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits:

List	Components	CAS-No.	Туре	Value
ACGIH	Cobalt tricarbonyl nitrosyl	14096-82-3	TLV	0.02 mg/m ³ (Co metal)
				TWA – 8 hours

Engineering Controls:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

Section 8. Exposure Controls/Personal Protection

Environmental Exposure Controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual Protection Measures

Hygiene Measures:

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Do not inhale sprays/mists/vapors/gases. Avoid contact with eyes and skin. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or gases. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

Skin Protection

Hand Protection:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant 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. For full contact, wear Neoprene or nitrile rubber gloves.

Section 8. Exposure Controls/Personal Protection

Appropriate footwear and any additional skin protection Other Skin Protection:

measures should be selected based on the task being

performed and the risks involved and should be approved by a

specialist before handling this product.

Respiratory Protection: Where risk assessment shows air-purifying respirators are

> appropriate use a full-face respirator with multipurpose 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 CEN (EU).

Section 9. Physical and Chemical Properties

Liquid. **Physical State:** Dark red. Color:

Musty/acrid, unpleasant. Odor:

Odor Threshold: No data available. No data available. pH: **Melting Point:** -1 °C (30.2 °F).

48.6 °C (119.5 °F). **Boiling Point:** No data available. Flash Point:

Decomposition Temperature: 55 °C (131 °F). 1.47 gm/cm³ **Specific Gravity:** No data available. **Vapor Pressure:**

No data available. Vapor Density:

Insoluble, reacts with water. Water Solubility:

Section 10. Stability and Reactivity

Moisture sensitive. Reactivity:

This product is stable when stored under a dry, inert **Chemical Stability:**

> atmosphere and away from heat. Nitrogen containing less than 5 ppm each moisture and air and a temperature range of 2 – 8 °C is recommended. This product is not

sensitive to impact.

Section 10. Stability and Reactivity

Exposure to water/moisture, sources of ignition (heat, Conditions to Avoid:

flames, sparks, electrostatic discharge), extremes of

temperature and direct sunlight.

Water, compounds containing active hydrogen (alcohols, **Incompatible Materials:**

acids) and strong oxidizing agents.

Hazardous Decomposition Products: Under normal conditions of storage and use, hazardous

> decomposition products should not be produced. Hazardous decomposition products formed under fire conditions: carbon oxides (CO_X) , nitrogen oxides (NO_X) and cobalt oxide fumes. Irritating and potentially toxic fumes and organic acid vapors may be generated during exposure to elevated temperatures or open flame. In the

event of a fire: see section 5.

Under normal conditions of storage and use noted above, **Possibility of Hazardous Reactions:**

hazardous reactions will not occur. Hazardous reactions or instability may occur under certain conditions of

storage or use.

Section 11. **Toxicological Information**

Information on Toxicological Effects

Acute Toxicity : Fatal if inhaled, toxic if ingested.

Irritation/Corrosion : No specific data available.

: May cause an allergic skin reaction. Sensitization

: No effects identified. **Germ Cell Mutagenicity**

Carcinogenity

: Cobalt; CAS 7440-48-4. Group 2B: possibly carcinogenic **IARC**

to humans.

: Cobalt; CAS 7440-48-4. Group A3: confirmed animal **ACGIH**

carcinogen with unknown relevance to humans

: Reasonably anticipated to be a human carcinogen. **NTP**

OSHA : No component of this product present at levels greater

than 0.1% is identified as probable, possible or

confirmed human carcinogen by OSHA.

Reproductive Toxicity : No specific data available.

Teratogenicity : No specific data available.

Specific Target Organ Toxicity

(Single Exposure)

: No specific data available.

Section 11. Toxicological Information

Specific Target Organ Toxicity (Repeated Exposure) **Aspiration Hazard**

: No specific data available.

permanent lung damage.

Information on the Likely **Routes of Exposure**

: Common routes of exposure: inhalation, dermal (failure to use skin protection), eye (failure to use safety eyewear). Less common: ingestion (failure to employ recommended hygiene measures (e.g. smoking or eating after handling product without washing hands or using hand protection).

: Chronic exposure to cobalt compounds may result in

Additional Information

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

Section 12. Ecological Information

Numerical Measures of Toxicity

Toxicity to Fish

Toxicity to Daphnia and Other

Aquatic Invertebrates

Toxicity to Algae

: No specific data available.

: No specific data available.

: No specific data available.

Persistence and Degradability

Biodegradability

Bioaccumulative Potential

Mobility in Soil

Other Adverse Effects

: No specific data available.

: No specific data available.

: No specific data available.

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

Section 13. Disposal Considerations

Waste Treatment Methods

Product Dispose of in accordance with local, state, and federal

regulations. Refer to 40 CFR 260-299 for complete waste

disposal regulations. Consult your local, state, or federal agency

before disposing of any chemicals.

Contaminated Packaging

Empty containers retain product residue (liquid and/or vapor) and can be dangerous. Dispose of as unused product. DO NOT EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY

EXPLODE AND CAUSE INJURY OR DEATH.

Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	UN 1992	UN 1992	UN 1992
UN Proper Shipping Name	Flammable liquid,	FLAMMABLE LIQUID,	Flammable liquid,
	toxic n.o.s. (cobalt	TOXIC, N.O.S.	toxic n.o.s. (cobalt
	tricarbonyl nitrosyl)	(cobalt tricarbonyl	tricarbonyl nitrosyl)
		nitrosyl)	
Transport Hazard Classes	3 (6.1)	3 (6.1)	3 (6.1)
Packing Group	II.	H	II
Environmental Hazards	-	-	-
Additional Information		EMS-No. F-E, S-D	

Special Precautions for User

: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

: Not applicable.

Section 15. Regulatory Information

TSCA (Toxic Substance Control Act):

This product is not listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory). Use of this product is restricted to research and development only. This product must be used under the supervision of a technically qualified individual as defined by the TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

SARA 302 Components

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

SARA 313 Components

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 (Flammable liquid); Acute Health Hazard (Acute toxicity – ingestion, inhalation; Skin Sensitization). Chronic Health Hazard (Carcinogenicity).

Massachusetts Right to Know Components

CAS-No. **Revision Date** 7440-48-4

Cobalt

Pennsylvania Right to Know Components

CAS-No. **Revision Date**

7440-48-4 Cobalt

Section 15. Regulatory Information

New Jersey Right to Know Components

CAS-No. Revision Date Cobalt 7440-48-4 8/2/2010

California Proposition 65 Components

This product contains a chemical known to State of California to cause cancer.

CAS-No. Revision Date 7440-48-4 11/20/2015

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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Copyright © 2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

HMIS Rating

HEALTH	4
FLAMMABILITY	3
PHYSICAL HAZARD	0

History

Date of Issue/Date of Revision : 5/4/2022

Date of Previous Issue : None.

References : None.

Section 16. Other Information

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.

ATE: Acute Toxicity Estimate

CAS: Chemical Abstracts Service (division of the American Chemical Society).

DOT: US Department of Transportation.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

HMIS: Hazardous Materials Identification System.

HNOC: Hazards Not Otherwise Classified.

IARC: International Agency for Research on Cancer.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA).

IDLH: Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).

IMDG: International Maritime Code for Dangerous Goods.

NFPA: National Fire Protection Association.

NIOSH: National Institute of Occupational Safety and Health.

NTP: National Toxicology Program. OEL: Occupational Exposure Limit.

OSHA: Occupational Safety and Health Administration.

PEL: Permissible Exposure Limits. **REL**: Recommended Exposure Limits.

SARA: Superfund Amendments and Reauthorization Act.

STEL: Short Term Exposure Limit (ACGIH)

STOT: Specific Target Organ Toxicity. TLV: Threshold Limit Values (ACGIH).

TWA: Time Weighted Average. VOC: Volatile Organic Compound.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.