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# SAFETY DATA SHEET

## Section 1. Identification

**Product Name:** Bis(cyclopentadienyl)cobalt(II)
**Product Type:** Solid
**CAS Number:** 1277-43-6
**Product Number:** CO7436
**Recommended Use:** Laboratory chemicals, synthesis of substances.
**Product Manufacturer:** Ereztech LLC
11555 Medlock Bridge Road, Suite 100
Johns Creek, GA 30097

**Product Information:** (888) 658-1221
**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 purple to black crystals or power, odor not determined.
**Classification:** FLAMMABLE SOLIDS – Category 2, H228
SENSITIZATION, SKIN - Category 1, H317
SENSITIZATION, RESPIRATORY - Category 1, H334
GERM CELL MUTAGENICITY - Category 2, H341
CARCINOGENICITY – Category 2, H351

**GHS Label Elements**
**Signal Word:** DANGER
**Hazard Statements:** H228: Flammable solid.
H317: May cause an allergic skin reaction.
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341: Suspected of causing genetic defects.
H351: Suspected of causing cancer.

**Hazard Pictograms:**

## Section 2. Hazards Identification

**Precautionary Statements**

**Prevention:**

P203: Obtain, read and follow all safety instructions before use.
P210: Keep away from heat, hot surfaces, sparks, open flames and other sources of ignition. – No smoking.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P261: Avoid breathing dusts/aerosols/vapors/gases.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284: Wear respiratory protection.

**Response:**

P302 + P352: IF ON SKIN: Wash with plenty of water.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P318: If exposed or concerned, get medical advice.
P333 + P317: If skin irritation or rash occurs: Get medical help.
P342 + P316: If experiencing respiratory symptoms: Get emergency medical help immediately.
P362 + P364: Take off contaminated clothing and wash it before reuse.
P370 + P378: In case of fire: Use water spray (fog), alcohol-resistant foam, carbon dioxide, dry chemical or dry sand for extinction.

**Storage:**

P405: Store locked up.

**Disposal:**

P501: Dispose of contents and container in accordance with federal, state and local regulations.

**General:**

None.

**OSHA/HCS Status:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Hazards Not Otherwise Classified [HNOC]:**

None identified.

## Section 3. Composition/Information on Ingredients

**Formula** : $C_{10}H_{10}Co$

**Molecular Weight** : 189.12 g/mol.

**CAS-No.** : 1277-43-6

**Synonyms** : Bis(cyclopentadienyl)cobalt; cobaltocene.

## Section 3. Composition/Information on Ingredients

| Ingredient Name | % | CAS Number |
|---|---|---|
| Bis(cyclopentadienyl)cobalt(II) | ≥ 98.5 | 1277-43-6 |

**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

**General Advice:** Move out of dangerous area. Get medical help immediately if symptoms develop or if you feel unwell. Show this safety data sheet to the doctor in attendance. 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.

**Eye Contact:** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing for at least 20 minutes. Get medical help if irritation develops and persists.

**Skin Contact:** Wash with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear impervious gloves while removing clothing. Continue to rinse for at least 20 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. Dispose of leather shoes which have been contaminated. Get medical help if irritation develops and persists.

**Inhalation:** Remove person to fresh air and keep at rest in a position comfortable for breathing. 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. Get medical help if symptoms develop or if you feel unwell.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. Get medical help if symptoms develop or if you feel unwell.

### Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

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

**Inhalation:** Product may cause allergy or asthma symptoms or breathing difficulties if inhaled. Symptoms may include coughing, sneezing with phlegm production, sore throat, nausea and headache.

**Skin Contact:** Product may cause an allergic skin reaction. Symptoms may include an itching or burning sensation, reddening and swelling.

## Section 4. First Aid Measures

**Ingestion:** The acute effects of ingestion of this product have not been determined.

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

**Notes to Physician:** Treat symptomatically.

**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

**General Hazards:** None identified.

**Suitable Extinguishing Media:** Use water spray (fog), dry chemical, foam or carbon dioxide ($CO_2$).

**Unsuitable Extinguishing Media:** Do not use water jet.

**Unusual Fire and Explosion Hazards:** None identified.

**Product of Combustion:** Decomposition products include carbon oxides, ($CO_X$) and cobalt oxide fumes. Irritating fumes and organic acid vapors may be generated during exposure to elevated temperatures or open flame.

**Protection of Firefighters:** 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.

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.

Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece 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 sources of ignition. Evacuate surrounding areas.

## Section 6. Accidental Release Measures

**For Non-Emergency Personnel: (cont.)**

Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid the formation and inhalation of dusts, aerosols, vapors and gases. Provide adequate ventilation. 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. Approach spill from upwind. Stop leak if without risk. Move containers from spill area if safe to do so. Prevent movement of material into sewers, water ways, basements or confined areas. Use spark-proof tools and explosion-proof equipment. Dispose of in accordance with federal, state and local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

**Small/Large Spill:**

Contain and collect spillage with a dry binding material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in dry, sealed container for disposal.

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 an 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 dusts, aerosols, vapors and gases. Do not ingest. 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). 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 well-ventilated 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. | Type | Value |
|---|---|---|---|---|
| **ACGIH** | Cobaltocene | 1277-43-6 | TLV | 0.02 mg/m$^3$ (as Co) |
| **OSHA** | Cobaltocene | 1277-43-6 | PEL | 0.1 mg/m$^3$ (as Co) |

**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. Contaminated clothing should not be allowed out of the workplace. Do not inhale dusts, aerosols, vapors or 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 dusts and aerosols. 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

**Other Skin Protection:** Appropriate footwear and any additional 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

**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

| | |
|---|---|
| **Physical State:** | Solid (crystals or powder). |
| **Color:** | Dark purple to black. |
| **Odor:** | No data available. |
| **Odor Threshold:** | No data available. |
| **pH:** | No data available. |
| **Melting Point:** | 176 - 180 °C (349 - 356 °F). |
| **Boiling Point:** | No data available. |
| **Flash Point:** | No data available. |
| **Auto-ignition temperature:** | No data available. |
| **Specific Gravity:** | No data available. |
| **Vapor Pressure:** | No data available. |
| **Vapor Density:** | No data available. |
| **Water Solubility:** | No data available. |

## Section 10. Stability and Reactivity

**Reactivity:** No specific data available.

**Chemical Stability:** This product is stable when stored under an inert 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.

## Section 10. Stability and Reactivity

**Conditions to Avoid:** Exposure to air/moisture, sources of ignition (heat, flames, sparks, electrostatic discharge), extremes of temperature and direct sunlight.

**Incompatible Materials:** Strong oxidizing agents, acids, halogens.

**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 ($CO_X$) and toxic cobalt oxide fumes. In the event of a fire: see section 5.

**Possibility of Hazardous Reactions:** Under normal conditions of storage and use, 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** : No specific data available.

**Irritation/Corrosion** : No specific data available.

**Sensitization** : No specific data available.

**Germ Cell Mutagenicity** : No specific data available.

**Carcinogenity**

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

**ACGIH** : Cobalt; CAS 7440-48-4. Group A3: confirmed animal carcinogen with unknown relevance to humans

**NTP** : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by 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.

**Specific Target Organ Toxicity (Repeated Exposure)** : Chronic exposure to cobalt compounds may result in permanent lung damage.

**Aspiration Hazard** : No specific data available.

## Section 11. Toxicological Information

**Information on the Likely Routes of Exposure** : Common routes of exposure: inhalation (failure to prevent dust formation), dermal (failure to use skin protection), eye (failure to use safety eyewear). Less common: ingestion (failure to employ recommended hygiene measures (e.g. smoking after handling product without washing hands or using hand protection).

**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** : No specific data available.

**Toxicity to Daphnia and Other Aquatic Invertebrates** : No specific data available.

**Toxicity to Algae** : No specific data available.

**Persistence and Degradability**

**Biodegradability** : No specific data available.

**Bioaccumulative Potential** : No specific data available.

**Mobility in Soil** : No specific data available.

**Other Adverse Effects** : 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 (liquids, vapors and gases) and can be dangerous. Dispose of as unused product. DO NOT EXPOSE OPENED/EMPTY 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 1325 | UN 1325 | UN 1325 |
| UN Proper Shipping Name | Flammable solid, organic, n.o.s. (Bis(cyclopentadienyl) cobalt(II)) | FLAMMABLE SOLID, ORGANIC, N.O.S. (Bis(cyclopentadienyl) cobalt(II)) | Flammable solid, organic, n.o.s. (Bis(cyclopentadienyl) cobalt(II)) |
| Transport Hazard Classes | 4.1 | 4.1 | 4.1 |
| Packing Group | III | III | III |
| Environmental Hazards | - | - | - |
| Additional Information | - | EMS No: F-A, S-G | - |

**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 listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory).

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

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313.

| | CAS-No. | Revision Date |
|---|---|---|
| Cobaltocene | 1277-43-6 | 7/8/2015 |

**SARA 311/312 Hazards**
Fire Hazard (Flammable solid), Acute Health Hazard (Respiratory/Skin sensitization), Chronic Health Hazard (Carcinogen)

**Massachusetts Right to Know Components**
No components are subject to Massachusetts Right to Know Act.

## Section 15. Regulatory Information

### Pennsylvania Right to Know Components

| | CAS-No. | Revision Date |
|---|---|---|
| Cobaltocene | 1277-43-6 | 7/8/2015 |

### New Jersey Right to Know Components

| | CAS-No. | Revision Date |
|---|---|---|
| Cobaltocene | 1277-43-6 | 7/8/2015 |

### California Proposition 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

## 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 | 1 |
| FLAMMABILITY | 2 |
| PHYSICAL HAZARD | 1 |

### History

**Date of Issue/Date of Revision** : 11/8/2023.

**Date of Previous Issue** : 7/26/2023.

# Section 16. Other Information

**References** : None available

**Abbreviations and Acronyms**

ACGIH: American Conference of Governmental Industrial Hygienists.
ATE: Acute Toxicity Estimate
CAS: Chemical Abstracts Service (division of the American Chemical Society).
CLP: Classification, Labeling and Packaging (European Union (EU)).
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.
OECD: Organization for Economic Co-Operation and Development.
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 (ST): Short Term Exposure Limit (ACGIH/NIOSH)
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.**