# SAFETY DATA SHEET

## 1. PRODUCT

### 1.1 Product identifiers

Name: Cobalt

CAS-No.: 7440-48-4

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

Identified uses : Laboratory chemicals, Synthesis of substances

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

Flammable solids (Category 1), H228

Respiratory sensitisation (Category 1), H334

Skin sensitisation (Category 1), H317

Chronic aquatic toxicity (Category 4), H413

For the full text of the H-Statements mentioned in this Section, see Section 16.

### 2.2 GHS Label elements, including precautionary statements

| | |
|---|---|
| Pictogram |  |
| Signal word | Danger |
| Hazard statement(s) | H228 Flammable solid.<br>H317 May cause an allergic skin reaction.<br>H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.<br>H413 May cause long lasting harmful effects to aquatic life. |
| Precautionary statement(s) | P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.<br>P240 Ground/bond container and receiving equipment.<br>P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.<br>P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.<br>P272 Contaminated work clothing should not be allowed out of the workplace.<br>P273 Avoid release to the environment.<br>P280 Wear protective gloves/ eye protection/ face protection.<br>P285 In case of inadequate ventilation wear respiratory protection.<br>P302 + P352 IF ON SKIN: Wash with plenty of soap and water.<br>P304 + P341 IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.<br>P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.<br>P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.<br>P363 Wash contaminated clothing before reuse.<br>P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.<br>P501 Dispose of contents/ container to an approved waste disposal plant. |

### 2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

No data available

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

| | |
|---|---|
| Formula: | Co |
| Molecular weight: | 58.93 g/mol |
| CAS-No.: | 7440-48-4 |
| EC-No.: | 231-158-0 |

**Hazardous components**

| Component | Classification | Concentration |
|---|---|---|
| **Cobalt** | | |
| | Flam. Sol. 1; Resp. Sens. 1; Skin Sens. 1; Aquatic Chronic 4; H228, H317, H334, H413 | <= 100 % |

For the full text of the H-Statements mentioned in this Section, see Section 16.

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## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

| **General advice** |
|---|
| Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area. |
| **If inhaled** |
| If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician. |
| **In case of skin contact** |
| Wash off with soap and plenty of water. Consult a physician. |
| **In case of eye contact** |
| Flush eyes with water as a precaution. |
| **If swallowed** |
| Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician. |

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

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

### 4.2 Indication of any immediate medical attention and special treatment needed

No data available

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## 5. FIREFIGHTING MEASURES

### 5.1 Extinguishing media

#### Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Special hazards arising from the substance or mixture

No data available

### 5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

### 5.4 Further information

Use water spray to cool unopened containers.

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## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

### 6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### 6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

### 6.4 Reference to other sections

For disposal see section 13.

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## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.

Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

### 7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Air sensitive. Handle and store under inert gas.

Storage class (TRGS 510): Flammable solid hazardous materials

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

**Components with workplace control parameters**

| Component | CAS-No. | Value | Control parameters | Basis |
|---|---|---|---|---|
| Cobalt | 7440-48-4 | TWA | 0.100000 mg/m3 | USA. Occupational Exposure Limits (OSHA) -Table Z-1 Limits for Air Contaminants |
| | | TWA | 0.020000 mg/m3 | USA. ACGIH Threshold Limit Values (TLV) |
| | Remarks | Pulmonary function Asthma Myocardial effects Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans | | |
| | | TWA | 0.050000 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.100000 mg/m3 | USA. Occupational Exposure Limits (OSHA) -Table Z-1 Limits for Air Contaminants |
| | | TWA | 0.050000 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.050000 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.050000 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.020000 mg/m3 | USA. ACGIH Threshold Limit Values (TLV) |
| | | Pulmonary function Asthma Myocardial effects Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans varies | | |

| Component | CAS-No. | Value | Control parameters | Basis |
|---|---|---|---|---|
| | | TWA | 0.05 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.05 mg/m3 | USA. NIOSH Recommended Exposure Limits |
| | | TWA | 0.1 mg/m3 | USA. Occupational Exposure Limits (OSHA) -Table Z-1 Limits for Air Contaminants |
| | | TWA | 0.02 mg/m3 | USA. ACGIH Threshold Limit Values (TLV) |
| | | Pulmonary function Asthma Myocardial effects Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans varies | | |
| | | PEL | 0.02 mg/m3 | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

**Biological occupational exposure limits**

| Component | CAS-No. | Parameters | Value | Biological specimen | Basis |
|---|---|---|---|---|---|
| Cobalt | 7440-48-4 | Cobalt | 15.0000 µg/l | Urine | ACGIH -Biological Exposure Indices (BEI) |
| | Remarks | End of shift at end of workweek | | | |
| | | Cobalt | 1.0000 µg/l | In blood | ACGIH -Biological Exposure Indices (BEI) |
| | | End of shift at end of workweek | | | |
| | | Cobalt | 15 µg/l | Urine | ACGIH -Biological Exposure Indices (BEI) |
| | | End of shift at end of workweek | | | |
| | | Cobalt | | Urine | ACGIH -Biological Exposure Indices (BEI) |
| | | End of shift at end of workweek | | | |

## 8.2 Exposure controls

### Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### Personal protective equipment

| | |
|---|---|
| Eye/face protection | Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). |
| Skin protection | Handle with 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.<br>Full contact<br>Material: Nitrile rubber<br>Minimum layer thickness: 0.11 mm<br>Break through time: 480 min<br>Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)<br>Splash contact<br>Material: Nitrile rubber<br>Minimum layer thickness: 0.11 mm<br>Break through time: 480 min<br>Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)<br>data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374<br>If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario. |
| Body Protection | Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. |
| Respiratory protection | Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) 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). |
| Control of environmental exposure | Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided. |

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| Appearance | Form: granular |
| 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 | 2,900 °C (5,252 °F) - lit. |
| Flash point | No data available |
| Evaporation rate | No data available |
| Flammability (solid, gas) | The substance or mixture is a flammable solid with the category 1. |
| Upper/lower flammability or explosive limits | No data available |
| Vapour pressure | No data available |
| Vapour density | No data available |
| Relative density | 8.9 g/mL at 25 °C (77 °F) |
| Water solubility | No data available |
| Partition coefficient: n-octanol/water | log Pow: 5.0 |
| Auto-ignition temperature | No data available |
| Decomposition temperature | No data available |
| Viscosity | No data available |
| Explosive properties | No data available |
| Oxidizing properties | No data available |

### 9.2 Other safety information

No data available

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## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

No data available

### 10.2 Chemical stability

Stable under recommended storage conditions.

### 10.3 Possibility of hazardous reactions

No data available

### 10.4 Conditions to avoid

Heat, flames and sparks.

### 10.5 Incompatible materials

Oxidizing agents, Mineral acidsAcetylene, Hydrazinium nitrate, Strong oxidizing agents, Material readily reacts with acids generating flammable and/or explosive hydrogen gas.

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Cobalt/cobalt oxides

Other decomposition products - No data available

In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

| |
|---|
| **Acute toxicity** |

| |
|---|
| LD50 Oral - Rat - 6,171 mg/kg<br>Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Ataxia. Diarrhoea<br>Inhalation: No data available<br>Dermal: No data available<br>No data available |
| **Skin corrosion/irritation** |
| No data available |
| **Serious eye damage/eye irritation** |
| No data available |
| **Respiratory or skin sensitisation** |
| **Germ cell mutagenicity** |
| No data available |
| **Carcinogenicity** |
| This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.<br>IARC: 2B - Group 2B: Possibly carcinogenic to humans (Cobalt)<br>2A - Group 2A: Probably carcinogenic to humans (Cobalt)<br>IARC: 2B - Group 2B: Possibly carcinogenic to humans (Cobalt)<br>2A - Group 2A: Probably carcinogenic to humans (Cobalt)<br>NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.<br>OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |
| **Reproductive toxicity** |
| No data available |
| **Specific target organ toxicity -single exposure** |
| No data available |
| **Specific target organ toxicity -repeated exposure** |
| No data available |
| **Aspiration hazard** |
| No data available |
| **Additional Information** |
| RTECS: GF8750000<br>Kidney injury may occur., Damage to the eyes., Lung irritation, Throat., Rash, Vomiting, Diarrhoea |

## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

| | |
|---|---|
| Toxicity to fish | LC50 - Danio rerio (zebra fish) - 100.01 mg/l - 96 h |
| Toxicity to daphnia and other aquatic invertebrates | No data available |
| Toxicity to algae | No data available |
| Toxicity to bacteria | 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 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

### 12.6 Other adverse effects

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

No data available

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

| Product |
|---|
| Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. |
| **Contaminated packaging** |
| Dispose of as unused product. |

## 14. TRANSPORT INFORMATION

### DOT (US)

UN number: 3089 Class: 4.1 Packing group: II

Proper shipping name: Metal powders, flammable, n.o.s.

Reportable Quantity (RQ):

Poison Inhalation Hazard: No

### IMDG

UN number: 3089 Class: 4.1 Packing group: II EMS-No: F-G, S-G

Proper shipping name: METAL POWDER, FLAMMABLE, N.O.S.

### IATA

UN number: 3089 Class: 4.1 Packing group: II

Proper shipping name: Metal powder, flammable, n.o.s.

## 15. REGULATORY INFORMATION

### 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:

| Component | CAS-No. | Revision Date |
|---|---|---|
| Cobalt | 7440-48-4 | 2007-07-01 |

### SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

### Massachusetts Right To Know Components

| Component | CAS-No. | Revision Date |
|---|---|---|
| Cobalt | 7440-48-4 | 2007-07-01 |

### Pennsylvania Right To Know Components

| Component | CAS-No. | Revision Date |
|---|---|---|
| Cobalt | 7440-48-4 | 2007-07-01 |

### New Jersey Right To Know Components

| Component | CAS-No. | Revision Date |
|---|---|---|
| Cobalt | 7440-48-4 | 2007-07-01 |

### California Prop. 65 Components

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

| Component | CAS-No. | Revision Date |
|---|---|---|
| Cobalt | 7440-48-4 | 2007-09-28 |

## 16. OTHER INFORMATION

### Full text of H-Statements referred to under sections 2 and 3.

Aquatic Chronic Chronic aquatic toxicity

Flam. Sol. Flammable solids

H228 Flammable solid.

H317 May cause an allergic skin reaction.

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H413 May cause long lasting harmful effects to aquatic life.

Resp. Sens. Respiratory sensitisation

Skin Sens. Skin sensitisation

### HMIS Rating

Health hazard: 0

Chronic Health Hazard: *

Flammability: 3

Physical Hazard 3

### NFPA Rating

Health hazard: 0

Fire Hazard: 3

Reactivity Hazard: 3