SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier : Cobalt dihydroxide

REACH Registration Number : 01-2119517583-39

CAS-No. : 21041-93-0

EC-No. : 244-166-4

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

Use of the Substance/Mixture : Intermediate, Paint, Fertilizers, Specialty chemical for industrial use, Resins., Production of catalysts and catalyst precursors, Chemical plating of metals, Production of batteries., Manufacture of glass., Colouring agents, pigments, Additive for printing inks., Paint additive

1.3 Details of the supplier of the safety data sheet

Company : 

E-mail address of person responsible for the SDS :

1.4 Emergency telephone number

Poison Center

Telephone :

Hours of operation : 24HRS

Supplier

Emergency telephone number : For transport in Europe, Central- and South America, Israel and Africa (Non-Arabic speaking countries):

For transport in the Middle East (Israel excluded) & Arabic speaking Africa:

For transport in the USA and Canada:

For transport in Asian and the Pacific (China excluded):

For transport in China:

Hours of operation : This telephone number is available 24 hours per day, 7 days per week.
SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

- Acute toxicity, Category 4: H302: Harmful if swallowed.
- Acute toxicity, Category 1: H330: Fatal if inhaled.
- Eye irritation, Category 2: H319: Causes serious eye irritation.
- Respiratory sensitisation, Sub-category 1B: H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- Skin sensitisation, Category 1: H317: May cause an allergic skin reaction.
- Reproductive toxicity, Sub-category 1B: H360Fd: May damage fertility. Suspected of damaging the unborn child.
- Carcinogenicity, Category 1B: H350i: May cause cancer by inhalation.
- Acute aquatic toxicity, Category 1: H400: Very toxic to aquatic life.
- Chronic aquatic toxicity, Category 2: H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

- Hazard pictograms:
  -骷髅和交叉骨头 (Skull and Crossbones)
  - 化学符号 (Chemical Symbol)
  - 阴燃符号 (Fire Symbol)

- Signal word: Danger

- Hazard statements:
  - H302: Harmful if swallowed.
  - H317: May cause an allergic skin reaction.
  - H319: Causes serious eye irritation.
  - H330: Fatal if inhaled.
  - H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  - H360Fd: May damage fertility. Suspected of damaging the unborn child.
  - H350i: May cause cancer by inhalation.
  - H400: Very toxic to aquatic life.

- Precautionary statements:
  - Prevention:
    - P201: Obtain special instructions before use.
    - P260: Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
    - P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
Cobalt Dihydroxide

Response:
P304 + P340 + P310  IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313  IF exposed or concerned: Get medical advice/attention.

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

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

EC-No. : 244-166-4

Hazardous components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No. EC-No. Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobalt dihydroxide</td>
<td>21041-93-0 244-166-4</td>
<td>Acute Tox. 4; H302 Acute Tox. 1; H330 Eye Irrit. 2; H319 Resp. Sens. 1B; H334 Skin Sens. 1; H317 Repr. 1B; H360Fd Carc. 1B; H350i Aquatic Acute 1; H400 Aquatic Chronic 2; H411</td>
<td>&lt;= 100</td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance. Symptoms of poisoning may appear several hours later. Do not leave the victim unattended.

If inhaled : Call a physician or poison control centre immediately. Move to fresh air.
If unconscious, place in recovery position and get medical attention immediately.

In case of skin contact:
- If on skin, rinse well with water.
- If on clothes, remove clothes.
- If symptoms persist, call a physician.
- Wash contaminated clothing before reuse.

In case of eye contact:
- Remove contact lenses.
- In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- Protect unharmed eye.
- Keep eye wide open while rinsing.

If swallowed:
- Keep respiratory tract clear.
- Do not give milk or alcoholic beverages.
- Never give anything by mouth to an unconscious person.
- Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms:
- Skin contact may provoke the following symptoms:
  - Allergic reactions
  - Inhalation may provoke the following symptoms:
  - Shortness of breath
  - Asthma
  - Ingestion may provoke the following symptoms:
  - Stomach/intestinal disorders
  - In case of eye contact
  - Excessive lachrymation

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media:
- High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting:
- Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products:
- Cobalt compounds
5.3 Advice for firefighters

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment.
Avoid dust formation.
Avoid breathing dust.
Ensure adequate ventilation.
Evacuate personnel to safe areas.

6.2 Environmental precautions

Environmental precautions: Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Pick up and arrange disposal without creating dust.
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling: Avoid formation of respirable particles.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Provide sufficient air exchange and/or exhaust in work rooms.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Advice on protection against fire and explosion: Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers: Prevent unauthorized access. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards. To maintain product quality, do not store in heat or direct sunlight.

Further information on storage stability: Keep in a dry place. No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobalt dihydroxide</td>
<td>Workers</td>
<td>Inhalation</td>
<td></td>
<td>0,063 mg/m3</td>
</tr>
</tbody>
</table>

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobalt dihydroxide</td>
<td>Sewage treatment plant</td>
<td>0,37 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water</td>
<td>0,00051 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0,00236 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>9,5 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>7,9 mg/kg dry weight (d.w.)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Engineering measures
Handle only in a place equipped with local exhaust (or other appropriate exhaust).

Personal protective equipment
Eye protection: Safety glasses with side-shields conforming to EN166
Skin and body protection: Dust impervious protective suit
Respiratory protection : In the case of dust or aerosol formation use respirator with an approved filter. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Appearance : powder
- Colour : purple
- Odour : odourless
- Melting point/range : Decomposition
- Flash point : Method: closed cup does not flash
- Flammability (solid, gas) : The product is not flammable.
- Relative density : 3,6
- Density : 3,6 g/cm3
- Solubility(ies)
  - Water solubility : insoluble
- Decomposition temperature : 250 °C

9.2 Other information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Stable at normal ambient temperature and pressure.

10.2 Chemical stability
No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions
Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid
Conditions to avoid : None known.

10.5 Incompatible materials
Materials to avoid : None.
10.6 Hazardous decomposition products
No decomposition if stored normally.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Components:

**cobalt hydroxide:**
Acute oral toxicity: LD50 (Rat, male and female): 1.060 mg/kg
Method: OECD Test Guideline 401

Acute inhalation toxicity: Assessment: The component/mixture is extremely toxic after short term inhalation. LC50 < 0.05mg/l
Method: OECD Test Guideline 436

Acute dermal toxicity: LD50 (Rat, male and female): > 2.000 mg/kg
Method: OECD Test Guideline 402
GLP: yes
Remarks: Based on read across from structural related substance:

Skin corrosion/irritation

**Product:**
Remarks: May cause skin irritation in susceptible persons.

Components:

**cobalt hydroxide:**
Assessment: No skin irritation
GLP: yes

Serious eye damage/eye irritation

**Product:**
Remarks: No data available

Components:

**cobalt hydroxide:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Eye irritation
GLP: no

Respiratory or skin sensitisation

Product:
Remarks: May cause sensitisation of susceptible persons by skin contact.

Components:

cobalt hydroxide:
Remarks: data waiving in REACH dossier

Germ cell mutagenicity

Product:
Genotoxicity in vitro : Remarks: No data available

Components:

cobalt hydroxide:
Genotoxicity in vitro : Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
GLP: yes
Remarks: Based on read across from structural related substance:
Copper sulphate

Carcinogenicity

Product:
Remarks: No data available

Components:

cobalt hydroxide:
Species: Mouse, (male and female)
Application Route: inhalation (vapour)
GLP: yes
Remarks: Based on read across from structural related substance:
Cobalt sulphate

Reproductive toxicity

Product:
Effects on fertility : Remarks: No data available
STOT - single exposure

Product:
Remarks: No data available

STOT - repeated exposure

Product:
Remarks: No data available

Repeated dose toxicity

Components:

cobalt hydroxide:
Species: Rat
NOAEL: 1.000 mg/kg
Application Route: Oral
Method: OECD Test Guideline 422
GLP: yes
Remarks: Based on read across from structural related substance: cobalt sulphide

Further information

Product:
Remarks: No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

cobalt hydroxide:
Toxicity to daphnia and other aquatic invertebrates:
EC10: 2,48 mg/l
Exposure time: 81 d
Test Type: flow-through test
GLP: yes
Remarks: Based on read across from structural related substance:
cobalt dichloride hexahydrate
Fresh water

M-Factor (Acute aquatic toxicity):
10

Toxicity to fish (Chronic toxicity):
EC10:
Exposure time: 81 d
Species: Oncorhynchus mykiss (rainbow trout)
Remarks: Based on read across from structural related substance:
cobalt dichloride hexahydrate
Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):

- EC10: 1.94 mg/l
- Exposure time: 28 d
- GLP: yes
- Remarks: Based on read across from structural related substance:
cobalt dichloride hexahydrate
Marine water

M-Factor (Chronic aquatic toxicity): 1

Ecotoxicology Assessment

Chronic aquatic toxicity: Toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

Components:

cobalt hydroxide:

Bioaccumulation: Bioconcentration factor (BCF): 180 - 4,000

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment: This substance/mixture contains no components considered
to be either persistent, bioaccumulative and toxic (PBT), or
very persistent and very bioaccumulative (vPvB) at levels of
0.1% or higher.

12.6 Other adverse effects

Product:

Additional ecological information:
- Very toxic to aquatic life.
- Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product: The product should not be allowed to enter drains, water courses or the soil. Dispose of in accordance with the European Directives on waste and hazardous waste. In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities. Send to a licensed waste management company.

Contaminated packaging: Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number

<table>
<thead>
<tr>
<th>ADN</th>
<th>ADR</th>
<th>RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN 3288</td>
<td>UN 3288</td>
<td>UN 3288</td>
<td>UN 3288</td>
<td>UN 3288</td>
</tr>
</tbody>
</table>

14.2 UN proper shipping name

<table>
<thead>
<tr>
<th>ADN</th>
<th>ADR</th>
<th>RID</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOXIC SOLID, INORGANIC, N.O.S. (cobalt dihydroxide)</td>
<td>TOXIC SOLID, INORGANIC, N.O.S. (cobalt dihydroxide)</td>
<td>TOXIC SOLID, INORGANIC, N.O.S. (cobalt dihydroxide)</td>
<td>TOXIC SOLID, INORGANIC, N.O.S. (cobalt dihydroxide)</td>
<td>Toxic solid, inorganic, n.o.s. (cobalt dihydroxide)</td>
</tr>
</tbody>
</table>

14.3 Transport hazard class(es)

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<tr>
<th>ADN</th>
<th>ADR</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>6.1</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Cobalt Dihydroxide

Version 0.0
Revision Date: 00.00.0000

14.4 Packing group

**ADN**
Packing group : I
Classification Code : T5
Hazard Identification Number : 66
Labels : 6.1

**ADR**
Packing group : I
Classification Code : T5
Hazard Identification Number : 66
Labels : 6.1
Tunnel restriction code : (C/E)

**RID**
Packing group : I
Classification Code : T5
Hazard Identification Number : 66
Labels : 6.1

**IMDG**
Packing group : I
Labels : 6.1
EmS Code : F-A, S-A
IMDG segregation code :

**IATA**
Packing instruction (cargo aircraft) : 673
Maximum quantity : 50.00 KG
Cobalt Dihydroxide

Packing instruction (passenger aircraft) : 666
Maximum quantity : 5,00 KG
Packing group : I
Labels : Toxic

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

14.8 Remark

Respirable fraction of the material is >10%

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Not applicable

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : Not applicable

REACH - List of substances subject to authorisation (Annex XIV) : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable


<table>
<thead>
<tr>
<th>E1</th>
<th>ENVIRONMENTAL HAZARDS</th>
<th>Quantity 1</th>
<th>Quantity 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>100 t</td>
<td>200 t</td>
</tr>
</tbody>
</table>
Cobalt Dihydroxide

Version 0.0  Revision Date: 00.00.0000

H1 ACUTE TOXIC  5 t  20 t
Volatile organic compounds:
Volatile organic compounds: Directive 2010/75/EU of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
Not applicable

Other regulations:
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

The components of this product are reported in the following inventories:
CH INV: On the inventory, or in compliance with the inventory
DSL: All components of this product are on the Canadian DSL
AICS: On the inventory, or in compliance with the inventory
NZIoC: Not in compliance with the inventory
ENCS: On the inventory, or in compliance with the inventory
ISHL: On the inventory, or in compliance with the inventory
KECI: On the inventory, or in compliance with the inventory
PICCS: Not in compliance with the inventory
IECSC: On the inventory, or in compliance with the inventory
TCSI: On the inventory, or in compliance with the inventory
TSCA: On TSCA Inventory

15.2 Chemical safety assessment
A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of other abbreviations
ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good
Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Other information : This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

The Exposure Scenario is currently not incorporated in the SDS. It can be provided upon request by your regular SDS contact person.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.