

Material Safety Data Sheet

Cobalt (II,III) Oxide Powder

Report No.: VIH240828006-1
Version: 2.1
Preparation Date: 28/08/2024
Revision Date: 28/08/2024

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product Name	Cobalt (II,III) Oxide
Product No.	270800PD
Formula	Co ₃ O ₄
CAS No.	1308-06-1
Synonyms	Cobalt Oxide

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

Identified uses	Laboratory chemicals, Scientific research
Uses advised against	Consulting manufacturers

1.3 Details of the supplier of the safety data sheet

Company Name	VI HALBLEITERMATERIAL GmbH
Street	Bergener Straße 14.,
City	Hannover
State	Niedersachsen
Zip Code	30625
Country	Germany
Tel	0049 1626484175
Email	info@vimaterial.de
Website	https://vimaterial.de/

1.4 Emergency telephone number

Emergency Phone #	0049 1626484175
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2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Physical hazards

Not Classified

Health hazards

Respiratory sensitization	Category 1B (H334)
Skin sensitisation	Category 1B (H317)
Carcinogenicity, Inhalation	Category 1 (H350i)

Environmental hazards

Long-term (chronic) aquatic hazard	Category 3 (H412)
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Full text of Hazard Statements: see section 16

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal Word	Danger
Pictograms	

Hazard Statements

H317	May cause an allergic skin reaction
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H350i	May cause cancer by inhalation.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements

Prevention	
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273	Avoid release to the environment
P280	Wear protective gloves/protective clothing.
P284	In case of inadequate ventilation wear respiratory protection
Response	
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

P308 + P313	IF exposed or concerned: Get medical advice/attention
Storage	
P405	Store locked up
Disposal	
P501	Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Other hazards

This product does not contain any substances classified as PBT or vPvB

This product does not contain any known or suspected endocrine disruptors.

3. Composition/information on ingredients

3.1 Substances

Chemical Family	Ceramic
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Component	CAS No.	EC No.	Concentration
Cobalt (II,III) Oxide (Co ₃ O ₄)	1308-06-1	215-157-2	<=100%

4. First aid measures

4.1 Description of first aid measures

General Treatment	If symptoms persist, call a physician. Show this Safety Data Sheet to the medical personnel.
Inhalation	Remove victim to fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions.
Skin	Take off immediately all contaminated clothing. Rinse skin with water/ shower. Seek medical attention.
Eyes	Rinse with pure water for at least 15 minutes. Remove contact lenses, if present and easy to do. Seek medical attention.
Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth with water. Seek medical attention.

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.

4.3 Indication of any immediate medical attention and special treatment needed

1	Based on the symptoms that appear, provide targeted treatment.
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2	Be aware that symptoms may be delayed.
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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
Unsuitable extinguishing media	N/A

5.2 Special hazards arising from the substance or mixture

1	Cobalt/cobalt oxides
2	Non-flammable.
3	Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

1	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
2	Fight fire from a safe distance and with adequate protection. Do not allow firefighting water to enter drains or water courses.
3	Collect contaminated firefighting water separately.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Remove persons to safety. Use personal protective equipment as required. Avoid dust formation. Remove all sources of ignition.
For emergency responders	Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2 Environmental Precautions

1	Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.
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6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill	Covering of drains, Take up mechanically.
Advice on how to clean up a spill	Take up mechanically. Take care not to raise dust.
Other information relating to spills and releases	Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

7. Handling and Storage

7.1 Precautions for safe handling

Recommendations	Wear personal protective equipment/face protection. Ensure adequate ventilation. Avoid ingestion and inhalation. Avoid dust formation. Do not get in eyes, on skin, or on clothing.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2 Conditions for safe storage, including any incompatibilities

Ventilation requirements	Keep containers tightly closed in a dry, cool and well-ventilated place.
Storage class	Non Combustible Solids.
Incompatible materials	See section 10.5.

7.3 Specific end use(s)

Use in laboratories.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Substance	CAS No.	Source	OEL (TWA)	Remarks
Cobalt(II,III) oxide (Co ₃ O ₄)	1308-06-1	TRGS 900 (DE)	0.01 mg/m ³ (inhalable fraction, as Co)	AGW*, Carc. 1A
Cobalt and inorganic cobalt	1308-06-1	EU SCOEL	0.01 mg/m ³ (respirable, as Co)	Carcinogen Cat. 1B

compounds				
Cobalt and inorganic cobalt compounds	1308-06-1	ACGIH TLV (USA)	0.02 mg/m ³ (inhalable fraction, as Co)	TLV Basis: Asthma, sensitization, cancer
Cobalt and inorganic cobalt compounds	1308-06-1	OSHA PEL (USA)	0.1 mg/m ³ (as Co, TWA)	-

Biological limit values

Jurisdiction / Body	Determinant (as Co)	Matrix	Sampling time	Limit value
ACGIH BEI (USA)	Cobalt (as Co)	Urine	End of shift at end of workweek	15 µg/L (≈ 255 nmol/L)
Germany (DFG)	BLW – Biological Guidance Value	Urine	Typically end of shift	35 µg/L
Germany (DFG)	BAR – Biological Reference Value	Urine	-	1.5 µg/L
Japan (JSOH OEL-B)	Cobalt (as Co)	Urine	End of shift at end of workweek	35 µg/L
Japan (JSOH OEL-B)	Cobalt (as Co)	Blood	End of shift at end of workweek	3 µg/L

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)

Population	Exposure route	Exposure pattern	DNEL	Basis
Workers	Inhalation	Long-term, local/systemic	0.01 mg/m ³ (as Co)	REACH data
General population	Inhalation	Long-term, systemic	0.005 mg/m ³ (as Co)	REACH data
General population	Oral	Long-term, systemic	0.006 mg/kg bw/day	REACH data

Predicted No Effect Concentration (PNEC)

Environmental compartment	PNEC	Basis
Freshwater	7.2 µg/L	REACH data
Marine water	0.6 µg/L	REACH data
Sediment (freshwater)	197 mg/kg dw	REACH data
Sediment (marine water)	18 mg/kg dw	REACH data
Soil (Agriculture)	7.9 mg/kg dw	REACH data
STP (sewage treatment plant)	0.045 mg/L	REACH data

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

Wear safety glasses with side shields (or goggles) (European standard - EN166) and face protection.

Skin protection

-Hand Protection

Protective gloves (The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.)

-Other protection measures

Wear appropriate protective gloves and clothing to prevent skin exposure. Wash hands thoroughly after handling.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly.

Large scale/emergency use	Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced Recommended Filter type: Particulates filter conforming to EN 143
Small scale/Laboratory use	Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. Recommended half mask:- Particle filtering: EN149:2001 When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

9. Physical and Chemical Characteristics

9.1 Information on basic physical and chemical properties

Physical State	Powder
Colour	Black
Odor	No data available
Melting Point/Range	895 °C
Boiling Point/Range	No data available
Flammability (liquid)	Not applicable
Flammability (solid, gas)	No data available
Explosion limits	No data available
Flash Point	No data available
Autoignition Temperature	No data available
Decomposition Temperature	> 900 °C
pH	N/A
Viscosity	Not applicable
Water Solubility	No data available
Solubility in other solvents	No data available
Partition Coefficient (n-octanol/water)	No data available
Vapor Pressure	No data available
Density / Specific Gravity	6,11 g/cm ³
Vapor Density	Not applicable
Particle characteristics	No data available

9.2 Other information

Molecular formula	Co ₃ O ₄
Molecular weight	240,8 g/mol
Evaporation Rate	Not applicable - Solid

10. Stability and reactivity

10.1 Reactivity

None known, based on information available

10.2 Chemical stability

Stable under normal conditions

10.3 Possibility of hazardous reactions

Hazardous Polymerization: No information available

Hazardous Reactions: No information available

10.4 Conditions to avoid

Avoid moisture.

10.5 Incompatible materials

Reducing agents

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

11. Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	Oral:	LD50 - Rat - > 5.000 mg/kg
	Dermal:	LD50 - Rat - > 2.000 mg/kg
	Inhalation:	LC50 - Rat - 4 h - > 5,06 mg/l - dust/mist
Skin corrosion/irritation	No data available.	
Serious eye damage/irritation	No data available.	
Respiratory or skin sensitization	May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.	
Germ cell mutagenicity	No data available.	
Carcinogenicity	May cause cancer by inhalation.	
Reproductive toxicity	No data available.	
STOT - single exposure	No data available.	
STOT - repeated exposure	No data available.	
Aspiration hazard	Not applicable. Solid	

11.2 Information on other hazards

Endocrine Disrupting Properties: Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

12. Ecological Information

12.1 Toxicity

Toxicity to fish	LC50 - Danio rerio (zebra fish) - > 136 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - > 136 mg/l - 48 h
Toxicity to algae	IC50 - Pseudokirchneriella subcapitata (green algae) - 88 mg/l – 72h

12.2 Persistence and degradability

Persistence	No data available.
Degradability	No data available.

12.3 Bioaccumulative potential

Bioaccumulative potential	No data available.
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12.4 Mobility in soil

Mobility in soil	No data available.
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12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	According to the results of its assessment, this substance is not a PBT or a vPvB.
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12.6 Endocrine disrupting properties

Endocrine Disruptor Information	This product does not contain any known or suspected endocrine disruptors.
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12.7 Other adverse effects

Persistent Organic Pollutant	This product does not contain any known or suspected substance
Ozone Depletion Potential	This product does not contain any known or suspected substance

13. Disposal Considerations

13.1 Waste treatment methods

Dispose of in accordance with all applicable local and national regulations. Use recovery/recycling where feasible, otherwise incineration is the recommended method of disposal. Empty containers may contain hazardous residues. Do not cut, puncture or weld on or near to the container. Labels should not be removed from containers until they have been cleaned. Contaminated containers must not be treated as household waste. Containers should be cleaned by appropriate methods and then re-used or disposed of by landfill or incineration as appropriate. Do not incinerate closed containers.

14. Transport information

IMDG

14.1. UN number	UN 3077
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14.2. UN Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
14.3. Transport hazard class(es)	9
14.4. Packaging group	III

ADR/RID/ADN

14.1. UN number	UN 3077
14.2. UN Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
14.3. Transport hazard class(es)	9
14.4. Packaging group	III

ICAO-IATA/DGR

14.1. UN number	UN 3077
14.2. UN Proper shipping name	Environmentally hazardous substance, solid, n.o.s.
14.3. Transport hazard class(es)	9
14.4. Packaging group	III

14.5. Environmental hazards	Hazardous to the aquatic environment
14.6. Special precautions for user	No special precautions required
14.7. Maritime transport in bulk according to IMO instruments	Not applicable, packaged goods

15. Regulatory information

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

This Safety Data Sheet is prepared in accordance with Commission Regulation (EC) 1907/2006, amended by Commission Regulation (EU) 2020/878.

Authorisations/Restrictions

Regulation (EC) 1907/2006, REACH, Annex XIV list of substances subject to authorisation:	Not applicable
Regulation (EC) 1907/2006, REACH, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances:	Not applicable
Regulation (EC) 1005/2009 on substances that deplete the ozone	Not applicable

layer:

Regulation (EC) 850/2004 on persistent organic pollutants, amended by (EU) No 2019/1021: Not applicable

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

16. Other information

Revision information

Preparation date	28/08/2024
Revision date	28/08/2024
Revision reason	Creation.

Abbreviations and acronyms

CAS	Chemical Abstracts Service
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
RID	Regulation concerning the International Carriage of Dangerous Goods by Rail
IATA	International Air Transportation Association
IMDG	International Maritime Dangerous Goods
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
TWA	Time Weighted Average
STOT	Specific target organ toxicity
PBT	Persistent, Bioaccumulative, Toxic
vPvB	Very Persistent, very Bioaccumulative
WEL	Workplace exposure limit

References

- [1] CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- [2] ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>
- [3] eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- [4] Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- [5] HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- [6] IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- [7] IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

[8] ERG - Emergency Response Guidebook by U.S. Department of Transportation, website:
<http://www.phmsa.dot.gov/hazmat/library/erg>

List of relevant phrases (code and full text as stated in chapter 2 and 3)

H317	May cause an allergic skin reaction
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H350i	May cause cancer by inhalation.
H412	Harmful to aquatic life with long lasting effects.

Disclaimer

The information of this safety data sheet is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products. For further information please contact info@vimaterial.de.