

SAFETY DATA SHEET

1. PRODUCT

1.1 Product identifiers

Name: Cobalt(II,III) oxide

CAS-No.: 1308-06-1

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)

Respiratory sensitisation (Category 1), H334

Skin sensitisation (Category 1), H317


Carcinogenicity (Category 1A), H350

Acute aquatic toxicity (Category 3), H402

Chronic aquatic toxicity (Category 3), H412

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)	H317 May cause an allergic skin reaction. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H350 May cause cancer. H412 Harmful to aquatic life with long lasting effects.
Precautionary statement(s)	P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray. P272 Contaminated work clothing should not be allowed out of the workplace. P273 Avoid release to the environment. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P285 In case of inadequate ventilation wear respiratory protection. P302 + P352 IF ON SKIN: Wash with plenty of soap and water. P304 + P341 IF INHALED: If breathing is difficult, 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. P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention. P363 Wash contaminated clothing before reuse. P405 Store locked up. 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_3O_4
Molecular weight: 240.80 g/mol
CAS-No.: 1308-06-1

Hazardous components

Component	Classification	Concentration
Tricobalt tetraoxide		
	Resp. Sens. 1; Aquatic Acute 3; Aquatic Chronic 3; H334, H412	<= 100 %
Nickel monoxide		
	Skin Sens. 1; Carc. 1A; STOT RE 1; Aquatic Chronic 4; H317, H350, H372, H413	>= 0.1 -< 1 %

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

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
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

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

No data available

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. 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

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

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.

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.

hygroscopic Keep in a dry place.

Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tricobalt tetraoxide	1308-06-1	TWA	0.020000 mg/m ³	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 varies		
		TWA 0.02 mg/m ³ 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		
Nickel monoxide	1313-99-1	TWA	1.000000 mg/m ³	USA. Occupational Exposure Limits (OSHA) -Table Z-1 Limits for Air Contaminants
		TWA	0.015000 mg/m ³	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	0.200000 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Lung cancer Confirmed human carcinogen varies		

Component	CAS-No.	Value	Control parameters	Basis
		TWA	1 mg/m ³	USA. Occupational Exposure Limits (OSHA) -Table Z-1 Limits for Air Contaminants
		TWA	0.2 mg/m ³	USA. ACGIH Threshold Limit Values (TLV)
		Lung cancer Confirmed human carcinogen varies		
		TWA	0.015 mg/m ³	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		PEL	0.1 mg/m ³	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Tricobalt tetraoxide	1308-06-1	Cobalt	15 µg/l	Urine	ACGIH -Biological Exposure Indices (BEI)
		Remarks	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. Full contact Material: Nature latex/chloroprene Minimum layer thickness: 0.6 mm Break through time: > 480 min Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M) Splash contact Material: Nature latex/chloroprene Minimum layer thickness: 0.6 mm Break through time: > 480 min Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M) data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374 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, 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Form: powder Colour: black
Odour	No data available
Odour Threshold	No data available
pH	No data available
Melting point/freezing point	Melting point/range: 895 °C (1,643 °F) - lit.

Initial boiling point and boiling range	No data available
Flash point	No data available
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	No data available
Vapour pressure	No data available
Vapour density	No data available
Relative density	6.11 g/mL at 25 °C (77 °F)
Water solubility	0.00156 g/l at 20 °C (68 °F) - OECD Test Guideline 105 - slightly soluble
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No data available
Decomposition temperature	> 900 °C (> 1,652 °F) -
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available

9.2 Other safety information

Bulk density: 0.78 g/l

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

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 toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - > 5,000 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rat - 4 h - > 5.06 mg/l

(OECD Test Guideline 436)

LD50 Dermal - Rat - male and female - > 2,000 mg/kg

(OECD Test Guideline 402)

No data available

Skin corrosion/irritation

Skin - Rat

Result: No skin irritation

Serious eye damage/eye irritation

Eyes - Rabbit Result: No eye irritation (OECD Test Guideline 405)
Respiratory or skin sensitisation
in vivo assay - Mouse Result: Does not cause skin sensitisation. (OECD Test Guideline 429)
Germ cell mutagenicity
No data available in vitro assay mouse lymphoma cells Result: negative OECD Test Guideline 475 Rat - male and female Result: negative
Carcinogenicity
IARC: 1 - Group 1: Carcinogenic to humans (Nickel monoxide) IARC: 1 - Group 1: Carcinogenic to humans (Nickel monoxide) NTP: Known to be human carcinogen (Nickel monoxide) NTP: Known to be human carcinogen (Nickel monoxide) 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. 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 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: Not available Effects due to ingestion may include:, Burning pain in mouth, throat and stomach., Prolonged or repeated exposure may cause:, Fatigue, Cardiac irregularities, Convulsions, Vomiting Stomach - Irregularities - Based on Human Evidence Stomach - Irregularities - Based on Human Evidence Stomach - Irregularities - Based on Human Evidence (Nickel monoxide)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	No data available
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - > 136 mg/l - 48 h
Toxicity to algae	EC50 - Pseudokirchneriella subcapitata (green algae) - 88 mg/l - 72 h
Toxicity to bacteria	No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

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.

Harmful to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

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
Nickel monoxide	1313-99-1	1993-04-24
Tricobalt tetraoxide	1308-06-1	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

Component	CAS-No.	Revision Date
Nickel monoxide	1313-99-1	1993-04-24

Pennsylvania Right To Know Components

Component	CAS-No.	Revision Date
Tricobalt tetraoxide	1308-06-1	2007-07-01
Nickel monoxide	1313-99-1	1993-04-24

New Jersey Right To Know Components

Component	CAS-No.	Revision Date
Tricobalt tetraoxide	1308-06-1	2007-07-01
Nickel monoxide	1313-99-1	1993-04-24

California Prop. 65 Components

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

Component	CAS-No.	Revision Date
Nickel monoxide	1313-99-1	2007-09-28

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

Component	CAS-No.	Revision Date
Nickel monoxide	1313-99-1	2007-09-28

16. OTHER INFORMATION

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

Aquatic Acute Acute aquatic toxicity

Aquatic Chronic Chronic aquatic toxicity

Carc. Carcinogenicity

H317 May cause an allergic skin reaction.

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

H350 May cause cancer.

H372 Causes damage to organs through prolonged or repeated exposure if inhaled.

H402 Harmful to aquatic life.

H412 Harmful to aquatic life with long lasting effects.

H413 May cause long lasting harmful effects to aquatic life.

Resp. Sens. Respiratory sensitisation

Skin Sens. Skin sensitisation

STOT RE Specific target organ toxicity - repeated exposure

HMIS Rating

Health hazard: 2

Chronic Health Hazard: *

Flammability: 0

Physical Hazard 0

NFPA Rating

Health hazard: 2

Fire Hazard: 0

Reactivity Hazard: 0