

Intermediate Product of Cobalt Metallurgy

Section 1. Substance and Company Identification

Intermediate Product of Cobalt Metallurgy

Synonyms: Impure Cobalt Carbonate

Used in manufacturing of cobalt based chemicals

Exposure Scenarios: See Annex 1

Company identification:

Manufactured by:

Vale Nouvelle-Calédonie SAS
52 Avenue du maréchal Foch - BP : 218
98.845 Nouméa Cédex
New Caledonia

REACH Only Representative for Vale New Caledonia

H2 Compliance
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For Fire, Spill, or chemical emergency call CHEMTREC: +1 703 527-3887

Section 2. Hazards Identification

2.1 Classification of the Substance:

2.1.1 Classification according Regulation (EC) No. 1272/2008

Acute Toxicity (oral) – Category 4
Respiratory Sensitization – Category 1B
Skin Sensitization – Category 1
Carcinogenicity – Category 1B
Reproductive toxicity – Category 1B
Germ Cell Mutagenicity – Category 2
Aquatic Acute – Category 1 (M factor of 10)
Aquatic Chronic – Category 1

Hazard Pictograms: GHS07- Exclamation Mark GHS08 - Health Hazard GHS09 - Environment

Signal Word: Danger

Hazard Statements: H302 – Harmful if Swallowed

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
 H350i – May cause cancer by inhalation
 H360Fd – May damage fertility and is suspected of harming the unborn child
 H400 – Very toxic to aquatic life
 H410 – Very toxic to aquatic life with long lasting effects




Precautionary Statements: P201, P202, P261, P264, P270, P272, P273, P280, P284, P321, P330, P362, P363, P301+P312, P302+P352, P304+P340, P308+P313, P332+P313, P333+P313, P342+P311, P391, P405, P501

2.2: Label elements

Labeling according to Regulation (EC) No 1272/2008

Product identifier: Intermediate Product of Cobalt Metallurgy
 Ingredient: Cobalt carbonate 75-85%

Symbols: GHS07 – Exclamation Mark GHS08 - Health Hazard GHS09 – Environment

Signal Word: Danger

Hazard Statements: H302, H317, H334, H341, H350, H360Fd, H410

Precautionary Statements: P202, P261, P273, P280, P302+P352, P501
 (NOTE: P-statements has been reduced as per CLP regulation, the full list can be found in Section 15).

Section 3. Composition

Substance Mixture

Typical Analysis (%)

Components	Typical Composition (%)	C.A.S. Number	EINECS/ EC Label No.
Cobalt carbonate (CoCO ₃)	75-85	513-79-1	208-169-4
Water	10-25	7732-18-5	231-791-2

Sodium Chloride	5-10	7647-14-5	231-598-3
Manganese hydroxide (Mn(OH) ₂)	1.5-2.5	18933-05-6	606-171-3
Iron hydroxide (Fe(OH) ₂)	0-0.06	11113-66-9	234-346-0

REACH Registration #'s:

01-2119513233-54-XXXX – Vale Europe Limited

01-2119513233-54-XXXX – Vale Nouvelle-Calédonie SAS (H2 Compliance acting as Only Representative)

[Section 4. First Aid Measures](#)

- Ingestion: Do not induce vomiting. Seek immediate medical attention.
- Inhalation: Remove to well ventilate area. Seek medical attention.
- Skin Contact: Wash thoroughly with water. For rashes seek medical advice. Show label if possible.
- Eyes: Irrigate eyeball thoroughly with water for at least 10 minutes. If discomfort persists seek medical attention.
- Wounds: Cleanse thoroughly to remove any particles.

[Section 5. Fire Fighting Measures](#)

- Suitable extinguishing media: Any, type to be selected according to materials stored in the immediate neighborhood.
- Special risks: Non-flammable under normal conditions.
- Special protective equipment for fire-fighting: None needed. Wear protective equipment if required for other materials in the area.

[Section 6. Accidental Release Measures](#)

- Health precautionary measures: Wear waterproof gloves and suitable protective clothing. Avoid generation of dusty atmospheres. Do not inhale dusts. Wear appropriate nationally approved respirators if

collection and disposal of spills is likely to cause the concentration limits if airborne cobalt to exceed locally prescribed limits.

Environmental protection

measures: Do not allow spills to enter watercourses. Dispose of spills in accordance with local regulations

Procedures for

cleaning/absorption: For spills and releases follow local procedures. Collect spills by sweeping or vacuuming.

[Section 7. Handling and Storage](#)

Keep in the container supplied and keep container closed when not in use. Wear suitable protective clothing including gloves, and respirator. If ingested seek medical advice immediately. Avoid contact with skin and eyes.

[Section 8. Exposure Controls / Personal Protection](#)

8.1.1 Exposure Limits:

Cobalt Carbonate (as Co)	Exposure Limit (mg/m ³)
ACGIH TLV-TWA, USA ¹	0.02
UK WEL ²	0.1

DNEL's as Co

DNEL	Oral	Inhalation	Dermal
Industry - Long Term – Local effects	-	40 µg/m ³	-
Industry - Long Term - Systemic effects	-	-	-
Industry - Short term - Local effects	-	-	-
Industry - Short term - Systemic effects	-	-	-
Consumer - Long Term - Local effects	-	6.3 µg/m ³	-
Consumer - Long Term - Systemic effects	29.8 µg/kg bw/day	-	-
Consumer - Short term - Local effects	-	-	-
Consumer - Short term - Systemic effects	-	-	-

8.1.2 Environmental Limits:

PNEC's

	PNEC
Aquatic Compartment	0.60µg Co/l (Fresh water).
Marine Compartment	2.36 µg Co/L

Freshwater Compartment – sediment	9.5 mg Co/kg sediment dry wt
Marine Compartment - sediment	9.5 mg Co/kg sediment dry wt
Terrestrial Compartment (soil)	10.9 mg/kg Soil dw.
Sewage Treatment Plant - microorganisms	0.373 µg Co/L
Atmospheric Compartment	-

Maintain airborne cobalt levels as low as possible.

Do not inhale dust. A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. If ventilation alone cannot control exposure, use respirators nationally approved for the purpose.

Avoid skin and eye contact. Wear goggles or face shield. Wear suitable protective clothing and gloves. Wash skin thoroughly after handling and before eating, drinking or smoking. Launder clothing and gloves as needed.

[Section 9. Physical and Chemical Properties](#)

Odorless, pink – red crystalline solid powder.

Physical state at 20°C and 101.3 kPa	solid
Melting / freezing point	Not available
Boiling point	Not available
Decomposition temperature	Not applicable
Relative density	3.3 – 4.1 g/cm ³
Vapour pressure	Not applicable
Vapour density	Not applicable
Surface tension	Not applicable
Water solubility	Insoluble
pH	Not applicable
Evaporation rate	Not applicable
Partition coefficient n-octanol/water (log value)	Not applicable
Flash point	Not applicable
Flammability	Non-flammable
Explosive properties	Non-explosive
Self-ignition temperature	Not applicable
Oxidising properties	Non-oxidising

Granulometry	90% <100 microns
Stability in organic solvents and identity of relevant degradation products	Not applicable
Dissociation constant	Not applicable
Viscosity	Not applicable
Bulk density	1.3 – 1.7 g/cm ³

Section 10. Stability and Reactivity

Stable under ordinary conditions of use and storage. May air-oxidize.

Hazardous Decomposition

Products: Burning may produce carbon monoxide and carbon dioxide.

Hazardous Polymerization: Will not occur.

Incompatibilities: Strong oxidizers.

Conditions to avoid: Air, incompatibles.

Section 11. Toxicological Information³

The toxicological properties of this impure intermediate product are unknown. The toxicology of the hazardous ingredient is summarized below:

Cobalt Carbonate

LD 50 (oral, rat) = 640 mg/kg

Inhalation: Causes irritation to the respiratory tract, symptoms may include coughing, shortness of breath, and nausea. Respiratory hypersensitivity, asthma may appear. Inhalation of cobalt dust and fumes is associated with an increased incidence of lung disease.

Ingestion: Causes abdominal pain, nausea, vomiting, flushing of the face and ears, mild hypotension, rash, and ringing in the ears. May have cumulative toxic action where elimination cannot keep pace with absorption. Large amounts depress erythrocyte production.

Skin Contact: May cause dermatitis. Causes irritation to skin. Symptoms include redness, itching, and pain.

Eye Contact: Causes irritation, redness, and pain.

Chronic Exposure: Prolonged or repeated skin exposure may cause dermatitis. Chronic exposure associated with kidney, heart and lung damage.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory

function may be more susceptible to the effects of the substance. Persons with allergies or sensitivity to cobalt may also be more susceptible to the effects of the substance.

Mutagenicity: Soluble cobalt salts do induce some genotoxic effects in vitro, mainly manifest as DNA strand or chromosome breaks, which are consistent with a reactive oxygen mechanism, as has been proposed by various authors. It has been concluded that effective protective processes exist in vivo to prevent genetic toxicity with relevance for humans from the soluble cobalt salts category (OECD 2014, Kirkland et al. 2015). Based on the above information, the classification criteria for germ cell mutagenicity according to regulation (EC) 1272/2008 are not met, thus no classification should be required. However, in the EU cobalt carbonate has been given a harmonized classification as Muta 2 under the first ATP.

Reproductive toxicity: Based on the existing published data on fertility impairment of bioavailable cobalt substances group all members of the bioavailable cobalt substances group are self-classified as toxic for reproduction category 1B (H360F). Findings in the pre-natal developmental toxicity study in rabbits manifested as increased early resorptions at presence of some maternal toxicity. Consequently, all members of the bioavailable cobalt substances group including cobalt carbonate are self-classified for developmental toxicity Category 2 (H361d).

Carcinogenicity: The International Agency for Research on Cancer (IARC) (Vol 52) found there was inadequate evidence that cobalt compounds are carcinogenic to humans, but since there was limited evidence that it is carcinogenic to animals, IARC concluded that cobalt compounds are possibly carcinogenic to humans (Group 2B). The ACGIH categorized cobalt compounds as: A3 "Confirmed animal carcinogen with unknown relevance to Humans". In the EU cobalt carbonate has been given a harmonized classification as Carcinogenic – Category 1B, H350i under the first ATP.

Section 12. Ecological Information

Cobalt carbonate is classified as very toxic. It requires labeling with the Environment pictogram. Labels must carry the risk phrase Very Toxic to aquatic life with long-lasting effects.

Section 13. Disposal Considerations

Material is normally collected to recover metals. Waste and containers must be disposed of as hazardous waste.

Section 14. Transport Information

International Marine Dangerous Goods Code	UN 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (cobalt carbonate) class 9 pg III MARINE POLLUTANT
International Civil Aviation Organization Technical Instructions for the Dangerous Goods by Air	UN 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (cobalt carbonate) class 9 pg III

U.S. Dept. of Transportation Regulations	Not regulated
Canadian Transportation of Dangerous Goods Act	Not regulated
European Agreement Concerning the International Carriage of Dangerous Goods by Road	UN 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (cobalt carbonate) class 9 pg III (E)

Marpol Annex V

Under the 7 Criteria contained within the MARPOL Annex V, this material is classified as :

X	Harmful to the Marine Environment (HME)
	Not Harmful to the Marine Environment (non-HME)

[Section 15. Regulatory Information](#)

Classification according to Part 3 of Annex VI of EU Regulation No. 1272/2008

- Acute Toxicity (oral) – Category 4
- Respiratory Sensitization – Category 1B
- Skin Sensitization – Category 1
- Carcinogenicity – Category 1B
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Precautionary Statements:

- Prevention:
- P201 - Obtain special instruction before use.
 - P202 - Do not handle until all safety precautions have been read and understood

P330 – Rinse mouth
P261 - Avoid breathing dust or fume
P264 - Wash hands and face thoroughly after handling
P270 - Do not eat, drink, or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace.
P273 - Avoid release to the environment
P280 - Wear protective waterproof gloves and protective clothing
P284 - In case of inadequate ventilation wear approved respiratory protection

Response: P321 - See the First Aid section for specific treatment.
P362 – Take off contaminate clothing and wash before reuse
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P301+P312 - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing
P308+P313 - IF exposed or concerned: Get medical advice/ attention.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

Storage: P405 - Store locked up.

Disposal: P501 - Dispose of contents/container in accordance to local, and regional regulations

In Europe, Cobalt Carbonate is subject to the Control of Major Accident Hazards Directives 82/501EEC, 96/82/EC & 98/433/EC (The Seveso Directive).

Section 16. Other Information

Indications of Change:

- 1.0 – Original document
- 2.0 – Added CLP classifications
- 3.0 – Updated CHEMTREC phone number, added synonyms, modified ingredient name
- 3.1 – Corrected Respiratory Sensitization classification and added M factor
- 3.2 – Typical composition changed to 42-52% from 44-46%
- 3.3 – Updated GES table
- 3.4 – Revised to Cobalt Carbonate
- 3.5 – Revised composition and added MARPOL classification
- 3.6 – Updated to include REACH registration information in Section 3
- 3.7 – Updated to remove EU DSD classifications and include DNELs and PNECs.
- 3.8 – Updated Only Representative for Vale New Caledonia and reproductive toxicity classification

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MSDS available online at <http://www.vale.com/canada/en/business/mining/nickel/pages/default.aspx>

Note:

Vale believes that the information in this Safety Data Sheet is accurate. However, Vale makes no express or implied warranty as to the accuracy of such information and expressly disclaims any liability resulting from reliance on such information.

Footnotes:

1. *Threshold Limit Values of the American Conference of Governmental Industrial Hygienists. 2008.*
2. *Maximum Exposure Limit of the Health and Safety Executive in the U.K. in EH40/00.*
3. *Describes possible health hazards of the product supplied. If user operations change it to other chemical forms, whether as end products, intermediates or fugitive emissions, the possible health hazards of such forms must be determined by the user.*

ANNEX 1 – Exposure Scenarios

Exposure Scenarios can be obtained by clicking on the following link:

<http://www.vale.com/canada/EN/business/mining/product-safety-information/reach-scenarios-cobalt-carbonate/Pages/default.aspx>

If you are unable to retrieve the document or have difficulties, please use the following email address for assistance: msds@vale.com

GES 3 - Use at industrial sites - Manufacture of chemicals in wet-chemical processes (intermediate use)

GES 4 - Use at industrial sites - Industrial use of RM as intermediate for the production of another substance in catalyst or catalyst precursor manufacture

GES 5 - Formulation or re-packing - Formulation of metal surface treatment pre-formulations

GES 6 - Use at industrial sites - Passivation processes in surface treatment

GES 7 - Use at industrial sites - Passivation processes in surface treatment at large industrial sites with continuous processes

GES 8 - Use at industrial sites - Plating processes in surface treatment

GES 9 - Service life (worker at industrial site) - Industrial handling of surface treated articles (passivated/plated)

GES 10 - Service life (professional worker) - Professional handling of surface treated articles (passivated/plated)

GES 11 - Formulation or re-packing - Formulation for water treatment chemicals, oxygen scavengers, corrosion inhibitors

GES 12 - Use at industrial sites - Use of water treatment chemicals, oxygen scavengers, corrosion inhibitors

GES 13 - Use at industrial sites - Manufacture of inorganic pigments, frits, ceramic ware, glass (intermediate use)

GES 14 - Formulation or re-packing - Formulation of fertilizers and/or feed grade materials

GES 15 - Formulation or re-packing - Formulation of mixtures for use in biogas production

GES 16 - Use at industrial sites - Use in biogas production

GES 17 - Widespread use by professional workers - Professional use in biogas production

GES 18 - Use at industrial sites - Use in fermentation processes, in biotech and scientific research and standard analysis

