Intermediate Product of Cobalt Metallurgy

Section 1. Substance and Company Identification

Intermediate Product of Cobalt Metallurgy

Synonyms: Intermediate Cobalt Product

Used in manufacturing of cobalt based chemicals

Company identification:

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

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

Section 2. Hazards Identification

2.1 Classification of the Substance:
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

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, H360, H410

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

For full text of Precautionary statements see section 15.

Section 3. Composition

☒ **Substance** ☐ **Mixture**

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

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 neighbourhood.
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

Peron related 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

Hazardous Ingredient	CAS #	TLV [1] mg/m3*
Cobalt Carbonate	513-79-1	0.02 as Co

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/cm3
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/cm3

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 Information [2]

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

The material is classified as very toxic to the environment. 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

Europe:

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

Acute Toxicity (oral) – Category 4
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Symbols: GHS07 – Exclamation Mark GHS08 - Health Hazard GHS09 - Environment

Signal Word: Danger

Hazard Statements: H302 – Harmful if Swallowed
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H360Fd – May damage fertility and is suspected of harming the unborn child
H400 – Very toxic to aquatic life
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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 regulation

Canada:
WHMIS 2015 Classification:
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

All components are listed on the Canadian Domestic Substances List (DSL)

Section 16. Other Information

Indications of Change:

1.0 – Original document

1.1 – Updated reproductive toxicity classification

Prepared by:

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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. *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.*