SAFETY DATA SHEET
COBALT SULFATE, HEPTAHYDRATE
REVISION 3, DATE 01 OCT 20

1. IDENTIFICATION

Product Name	**Cobalt sulfate, heptahydrate**
Other Names	No Data Available
Uses	Ceramics, pigments, glazes, in plating baths for cobalt, additive to soils, catalyst, paint and ink drier, storage batteries. May not be used in food products.
Chemical Family	No Data Available
Chemical Formula	CoSO4.7H2O
Chemical Name	Sulfuric acid, cobalt(2+) salt (1:1), heptahydrate
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust)	Not Scheduled

Globally Harmonised System

Hazard Classification

Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories

Acute Toxicity (Oral) - Category 4

Sensitisation (Respiratory) - Category 1

Sensitisation (Skin) - Category 1

Carcinogenicity - Category 1B

Toxic To Reproduction - Category 1B

Specific Target Organ Toxicity (Repeated Exposure) - Category 1

Acute Hazard To The Aquatic Environment - Category 1

Long-term Hazard To The Aquatic Environment - Category 1

Pictograms

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.
H350	May cause cancer.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention	**P260**	Do not breathe dusts or mists.
	P285	In case of inadequate ventilation wear respiratory protection.
	P280	Wear protective gloves/protective clothing/eye protection/face protection.
	P201	Obtain special instructions before use.
	P273	Avoid release to the environment.
	P270	Do not eat, drink or smoke when using this product.
	P272	Contaminated work clothing should not be allowed out of the workplace.
Response	**P304 + P341**	IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P342 + P311	If experiencing respiratory symptoms: Call a POISON CENTER/doctor for emergency medical advice.
	P308 + P313	IF exposed or concerned: Get medical attention.
	P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
	P333 + P313	If skin irritation or rash occurs: Get medical attention.
	P391	Collect spillage.
	P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
	P330	Rinse mouth.
	P362 + P364	Take off contaminated clothing and wash it before reuse.
Storage	**P405**	Store locked up.
Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Safe Work Australia
National Guide for Classifying Hazardous Chemicals under the Model WHS Regulations

Hazard Classification	Hazardous according to the criteria of Safe Work Australia under Model WHS Regulations

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Cobalt sulfate, heptahydrate	CoSO4.7H2O	10026-24-1	<=100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth. Do not induce vomiting. Call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. If eye irritation persists, get medical advice/attention.
Skin	IF ON SKIN: Remove contaminated clothing and shoes immediately. Flush skin with with running water for at least 15 minutes. If skin irritation or rash occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician for advice. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.
Advice to Doctor	If exposed or concerned, get medical advice/attention. Treat symptomatically. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
Flammability Conditions	Non-combustible material.
Extinguishing Media	If material is involved in a fire, use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction.
Fire and Explosion Hazard	Decomposes on heating, emitting toxic fumes.
Hazardous Products of Combustion	Fire or heat may produce irritating, toxic and/or corrosive fumes.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.

Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. SCBA and structural firefighter's uniform may provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid generating dust. Do not breathe dust and avoid contact with eyes, skin and clothing.
Clean Up Procedures	Collect spillage (sweep or vacuum up) and seal in properly labelled containers for disposal (see SECTION 13).
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
Decontamination	No information available.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground.
Personal Precautionary Measures	Use personal protective equipment as required (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Obtain special instructions before use - Do not handle until all safety precautions have been read and understood. Avoid generating dust. Do not breathe dusts or mists and avoid contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection; In case of inadequate ventilation, wear respiratory protection (see SECTION 8). Avoid release to the environment - Collect spillage (see SECTION 6).
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep containers tightly closed when not in use - check regularly for spills. Avoid exposure to moisture. Avoid exposure to extremes of temperature. Keep away from foodstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For Cobalt, metal dust and fume (as Co): - Safe Work Australia Exposure Standard: TWA = 0.05 mg/m3; Respiratory and/or skin sensitiser (Sen). - New Zealand Workplace Exposure Standard (2018): TWA = 0.02 mg/m3; Exposure can also be estimated by biological monitoring (bio); Suspected carcinogen (6.7B); Skin absorption (skin); Dermal sensitiser (dsen); Respiratory sensitiser (rsen).
Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. 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.
Personal Protection Equipment	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: Positive pressure

	air supplied full-face respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Chemical goggles, face shield or air mask (not required if wearing air supplied mask). - Hand protection: Wear protective gloves. Recommended: Impervious gloves (long). - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Overalls, safety shoes.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or smoke when using this product. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystalline powder
Odour	Odourless
Colour	Red
pH	4 - 5 (10% soln.)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	No Data Available
Specific Gravity	No Data Available
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	No information available.

Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible material.
Reactions That Release Gases or Vapours	Decomposes on heating, emitting toxic fumes, including Sulfur oxides, Cobalt oxides.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	Contact with water liberates toxic gas. Contact with strong oxidising agents may cause fire.
Chemical Stability	Stable under normal storage and handling conditions.
Conditions to Avoid	Avoid generating dust. Avoid exposure to moisture. Avoid exposure to extremes of temperature.
Materials to Avoid	Incompatible/reactive with strong oxidising agents.
Hazardous Decomposition Products	Decomposes on heating, emitting toxic fumes, including Sulfur oxides, Cobalt oxides.
Hazardous Polymerisation	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

General Information

- Acute toxicity: Harmful if swallowed. Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain.
- Skin corrosion/irritation: May cause skin irritation. Prolonged and/or repeated contact may cause irritation and/or dermatitis.
- Eye damage/irritation: Causes eye irritation.
- Respiratory/skin sensitisation: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
- Germ cell mutagenicity: Suspected of causing genetic defects; However, effective protective processes exist in vivo to prevent genotoxicity in humans [NICNAS]. In an occupational study in 35 workers in a cobalt refinery, there was no indication of increased DNA strand breaks or micronuclei in blood lymphocytes compared with 27 unexposed workers [NICNAS]. Cobalt sulfate, heptahydrate had no genotoxic effect in a mammalian bone marrow chromosome aberration test, in four SD rats administered a single oral gavage dose of 80, 160 or 320 mg/kg bw. [study similar to OECD TG 475]. Genotoxic effects observed in vitro are consistent with a reactive oxygen mechanism [NICNAS].
- Carcinogenicity: May cause cancer by inhalation. Cobalt sulfate and other soluble cobalt(II) salts (CAS No. 10026-24-1) are classified by the IARC Monographs as "Possibly carcinogenic to humans" (Group 2B).
- Reproductive toxicity: May damage fertility or the unborn child.
- STOT (single exposure): Breathing in dust may result in respiratory irritation.
- STOT (repeated exposure): Causes damage to organs through prolonged or repeated exposure. Chronic exposure may result in damage to the kidneys, lungs, heart, thyroid and skin.
- Aspiration toxicity: No information available.

Acute

Ingestion

Acute toxicity (Oral):
- LD50, Rat: 582 mg/kg

Carcinogen Category Cat. 1B

12. ECOLOGICAL INFORMATION

Ecotoxicity	No information available.
Persistence/Degradability	Not readily biodegradable.
Mobility	No information available.
Environmental Fate	Very toxic to aquatic life with long lasting effects - Avoid release to the environment.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	No information available.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Cobalt sulphate, heptahydrate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
EPG	47 Low To Moderate Hazard Substances
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	AU01
Comments	Not regulated as DG when transported by road or rail in packagings that do not incorporate a receptacle exceeding 500 kg(L) or IBCs.

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt sulphate, heptahydrate)
Class	9 Miscellaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
EPG	47 Low To Moderate Hazard Substances
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt sulphate, heptahydrate)
Class	9 Miscellaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
EPG	47 Low To Moderate Hazard Substances
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt sulphate, heptahydrate)
Class	9 Miscellaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
ERG	171 Substances (Low to Moderate Hazard)
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt sulphate, heptahydrate)
Class	9 Miscellaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available
EMS	F-A, S-F
Marine Pollutant	Yes

Air Transport
IATA DGR

Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Cobalt sulphate, heptahydrate)
Class	9 Miscellaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	Not Scheduled

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR002512 - Additives Process Chemicals and Raw Materials (Carcinogenic) Group Standard 2020

National/Regional Inventories

Australia (AIIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	COSULP0500, COSULP1000, COSULP1001, COSULP1002, COSULP1003, COSULP1004, COSULP1005, COSULP1006, COSULP1007, COSULP1008, COSULP1009, COSULP1010, COSULP1011, COSULP1012, COSULP1013, COSULP1014, COSULP1015, COSULP1016, COSULP1017, COSULP1018, COSULP1019, COSULP1020, COSULP1021, COSULP1022, COSULP1023, COSULP1024, COSULP1025, COSULP1026, COSULP1027, COSULP1028, COSULP1029, COSULP1030, COSULP1031, COSULP1032, COSULP1033, COSULP1034, COSULP1035, COSULP1036, COSULP1037, COSULP1038, COSULP1039, COSULP1200, COSULP1250, COSULP1251, COSULP1400, COSULP1500, COSULP1501, COSULP1502, COSULP1600, COSULP1700, COSULP1701, COSULP1800, COSULP1801, COSULP1802, COSULP1803, COSULP1804, COSULP1805, COSULP1806, COSULP1807, COSULP2000, COSULP2001, COSULP2002, COSULP2003, COSULP2004, COSULP2005, COSULP2006, COSULP2007, COSULP2100, COSULP2101, COSULP2102, COSULP2103, COSULP2104,

COSULP2105, COSULP2106, COSULP2107, COSULP2108, COSULP2109, COSULP2110, COSULP2111, COSULP2112, COSULP2113, COSULP2114, COSULP2115, COSULP2116, COSULP2117, COSULP2118, COSULP2119, COSULP2120, COSULP2121, COSULP2122, COSULP2123, COSULP2200, COSULP2201, COSULP2300, COSULP2301, COSULP2302, COSULP2500, COSULP2501, COSULP2502, COSULP2503, COSULP2600, COSULP2601, COSULP2700, COSULP2701, COSULP2702, COSULP2703, COSULP2800, COSULP2801, COSULP2802, COSULP3000, COSULP3001, COSULP3002, COSULP3100, COSULP3200, COSULP3300, COSULP3400, COSULP3401, COSULP3500, COSULP3501, COSULP3600, COSULP3610, COSULP3611, COSULP3700, COSULP3800, COSULP3900, COSULP4000, COSULP4100, COSULP4200, COSULP4201, COSULP4202, COSULP4203, COSULP4300, COSULP4301, COSULP4302, COSULP4400, COSULP4500, COSULP4501, COSULP4800, COSULP5000, COSULP5001, COSULP5002, COSULP5200, COSULP5201, COSULP5400, COSULP5500, COSULP5501, COSULP5502, COSULP6000, COSULP6200, COSULP6300, COSULP6500, COSULP7000, COSULP7100, COSULP7200, COSULP7300, COSULP7500, COSULP7501, COSULP8000, COSULP8001, COSULP8200, COSULP8201, COSULP8500, COSULP8600, COSULP9000, COSULP9100, COSULP9200, COSULP9201, COSULP9300, COSULP9500, COSULP9600, COSULP9700, COSULP9800, COSULP9820, COSULP9900

Revision 3

Revision Date 01 Oct 2020

Reason for Issue Update sds

Key/Legend

< Less Than
> Greater Than
AICS Australian Inventory of Chemical Substances
atm Atmosphere
CAS Chemical Abstracts Service (Registry Number)
cm^2 Square Centimetres
CO2 Carbon Dioxide
COD Chemical Oxygen Demand
deg C (°C) Degrees Celcius
EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm^3 Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m^3 Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m^3 Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m^3 Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million

ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight