



SAFETY DATA SHEET THIOUREA REVISION 5, DATE 09 MAR 22

1. IDENTIFICATION

Product Name	Thiourea
Other Names	2-Thiourea; Beta-Thiopseudourea; Isothiourea; Sulfoarea; Thiocarbamide
Uses	Organic synthesis; vulcanising accelerators; Production of pharmaceuticals, dyes, resins, plastic powder, rubber; Metal mineral flotation.
Chemical Family	No Data Available
Chemical Formula	CH ₄ N ₂ S
Chemical Name	Thiourea
Product Description	Mono-constituent substance (organic).

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)

Schedule 6

Redox Ltd
Corporate Office Sydney
Locked Bag 15 Minto NSW 2566 Australia
2 Swettenham Road Minto NSW 2566 Australia
All Deliveries: 4 Holmes Road Minto NSW 2566 Australia

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Fax +61 2 9733 3111
E-mail sydney@redox.com
Web www.redox.com
ABN 92 000 762 345




Australia
Adelaide
Brisbane
Melbourne
Perth
Sydney

New Zealand
Auckland
Christchurch
Hawke's Bay
UK
London

Malaysia
Kuala Lumpur
USA
Los Angeles
Oakland
Mexico
Saltillo



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 Carcinogenicity - Category 2 Toxic To Reproduction - Category 2 Acute Hazard To The Aquatic Environment - Category 2 Long-term Hazard To The Aquatic Environment - Category 2
Pictograms		  
Signal Word		Warning
Hazard Statements		H302 Harmful if swallowed. H351 Suspected of causing cancer. H361fd Suspected of damaging fertility. Suspected of damaging the unborn child. H411 Toxic to aquatic life with long lasting effects.
Precautionary Statements	Prevention	P281 Use personal protective equipment as required.
		P201 Obtain special instructions before use.
		P273 Avoid release to the environment.
		P264 Wash hands thoroughly after handling.
		P270 Do not eat, drink or smoke when using this product.
	Response	P308 + P313 IF exposed or concerned: Get medical advice.
		P391 Collect spillage.
		P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
		P330 Rinse mouth.
	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)
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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
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3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Thiourea	CH4N2S	62-56-6	<=100 %

4. FIRST AID MEASURES**Description of necessary measures according to routes of exposure**

Swallowed	IF SWALLOWED: Rinse mouth, then drink plenty of water. Do not induce vomiting unless directed to do so by medical personnel. 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: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs, get medical advice/attention.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If respiratory symptoms persist, get medical advice/attention. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult.
Advice to Doctor	If exposed or concerned, get medical advice/attention. Treat symptomatically and supportively. Symptoms may be delayed. 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	Combustible solid; May burn but does not ignite readily.
Extinguishing Media	Use dry chemical, Carbon dioxide (CO2), alcohol-resistant foam or water spray for extinction - Do not use water jet (may scatter or spread fire).
Fire and Explosion Hazard	Avoid generating dust; Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Hazardous Products of Combustion	Fire may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Sulfur oxides, Nitrogen oxides.
Special Fire Fighting Instructions	Prevent entry into drains and waterways. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Personal Protective Equipment	Wear positive pressure 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	>400 °C
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources (if dust clouds can occur). Do not touch or walk through spilled material. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect material (sweep or vacuum up) and place into suitable, properly labelled containers for later disposal (see SECTION 13). Avoid dispersal of dust in the air. Non-sparking tools should be used.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
Decontamination	Ventilate the area.
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). Large spill: Wear SCBA and chemical splash suit.

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 use until all safety precautions have been read and understood. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). WARNING: May form combustible dust concentrations in air! Keep away from heat and sources of ignition - No smoking. Take precautionary measures against static discharge.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Protect from moisture. Protect against physical damage. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuff containers and incompatible materials (see SECTION 10). Store locked up.
Container	Keep in the original container. *Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For dusts from solid substances without specific occupational exposure standards: - Safe Work Australia Exposure Standard (Nuisance dusts): 8 hr TWA = 10 mg/m ³ (measured as inhalable dust). - New Zealand WES (Particulates not otherwise classified): TWA = 10 mg/m ³ ; TWA = 3 mg/m ³ (respirable dust).
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. Use explosion-proof electrical/ventilating/lighting equipment.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation or if an inhalation risk exists. Recommended: Dust mask/particulate filter respirator or full-face respirator with multi-purpose combination or type AXBEK respirator cartridges (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Safety glasses or goggles. - Hand protection: Handle with gloves. Recommended: Impervious protective gloves, e.g. Butyl rubber. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Overalls, safety shoes.
Special Hazards Precautions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Remove contaminated clothing and shoes immediately and wash before reuse. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystalline
Odour	Odourless
Colour	White
pH	No Data Available
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	>35 °C
Melting Point	171 - 178 °C
Freezing Point	No Data Available
Solubility	Soluble in water
Specific Gravity	1.41 (Water = 1)
Flash Point	No Data Available
Auto Ignition Temp	>400 °C
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	>180 °C
Density	1.41 g/cm ³
Specific Heat	No Data Available
Molecular Weight	76.12 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	2.5
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	Avoid generating dust; Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
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	Combustible solid; May burn but does not ignite readily.
Reactions That Release Gases or Vapours	Fire/decomposition may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Sulfur oxides, Nitrogen oxides.
Release of Invisible Flammable Vapours and Gases	When heated, vapours may form explosive mixtures with air.

10. STABILITY AND REACTIVITY

General Information	No information available.
Chemical Stability	Stable under proper operation and storage conditions.
Conditions to Avoid	Avoid generating dust. Keep away from heat and sources of ignition.
Materials to Avoid	Incompatible/reactive with oxidising agents, strong acids, strong alkalis, Hydrogen peroxide, Acrolein, Acrylaldehyde.
Hazardous Decomposition Products	Fire/decomposition may produce irritating, toxic and/or corrosive fumes, including Carbon oxides, Sulfur oxides, Nitrogen oxides.
Hazardous Polymerisation	May occur when in contact with acrylaldehyde.

11. TOXICOLOGICAL INFORMATION

General Information	<ul style="list-style-type: none"> - Acute toxicity: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. - Skin corrosion/irritation: Slightly irritating to skin. May cause skin irritation. - Eye damage/irritation: May cause slight eye irritation. - Respiratory/skin sensitisation: Not found to induce dermal sensitisation (Guinea pigs). In humans: Cases of contact dermatitis have been reported in individuals following exposure to the chemical during formulation processes, or to products containing the chemical. May cause an allergic reaction, which becomes evident upon re-exposure to this material; May cause skin eruptions. - Germ cell mutagenicity: The chemical is considered unlikely to be a genotoxic carcinogen [NICNAS]. - Carcinogenicity: Suspected of causing cancer. Thiourea (CAS No. 62-56-6) is classified in Group 3 of the IARC Monographs: Not classifiable as to its carcinogenicity to humans, based on inadequate evidence for carcinogenicity in humans; However, there is (limited) evidence for carcinogenicity in animal testing. Thiourea is well absorbed and concentrates in the thyroid, where it causes decreased thyroid hormone production and a compensatory increase of proliferation of thyroid tissue. This is the probable basis of the tumourigenic activity of thiourea for the thyroid in experimental animals. - Reproductive toxicity: Suspected of damaging the unborn child. While there are limited data available, the known effect of reduction in thyroxine (T4) is strongly associated with developmental effects [NICNAS]. - STOT (single exposure): Inhalation of dust may cause respiratory tract irritation (mucous membranes). - STOT (repeated exposure): Reported effects include adverse effects relating to the thyroid, specifically enlargement or hyperplasia of the thyroid; reduced body weight, enlargement and increased weight of the pituitary and reduced levels of the thyroid hormone, thyroxine (T4). - Aspiration toxicity: No information available.
Acute	
Ingestion	Acute toxicity (Oral): - LD50, Rat: >2,000 - 2,500 mg/kg bw. [Supplier's SDS].
Other	Acute toxicity (Dermal): - LD50, Rabbits: >2,800 mg/kg bw.
Inhalation	Acute toxicity (Inhalation): - LC50, Rats: >195 mg/m3 (4 h) [maximum attainable concentration].
Carcinogen Category	Cat. 2

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - EC50, Crustacea: 16 mg/L (48 h). - ErC50, Algae/aquatic plants: 5.6 mg/L (96 h). - Chronic NOEC, Crustacea: 1.8 mg/L
Persistence/Degradability	Not readily biodegradable; however, may be regarded as inherently and ultimately biodegradable.
Mobility	Thiourea is expected to be mobile in soil. Thiourea is considered to be non-volatile from water surfaces and is not expected to volatilise from soil.

Environmental Fate	Toxic to aquatic life with long lasting effects - Prevent entry into drains and waterways.
Bioaccumulation Potential	Low potential for bioaccumulation (log octanol water partition coefficient less than 3).
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container through a licensed waste contractor and in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Contaminated packaging: Do not reuse empty containers. Do not burn or use a cutting torch on, or near, the empty drum.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	Thiourea
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. (Thiourea)
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. (Thiourea)
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. (Thiourea)
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. (Thiourea)
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. (Thiourea)
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)
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15. REGULATORY INFORMATION

General Information	THIOUREA
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Poisons Schedule (Aust)

Schedule 6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval CodeAdditives Process Chemicals and Raw Materials Carcinogenic Group Standard 2020 HSR002512
*HSR003323 (Revoked)**National/Regional Inventories**

Australia (AIIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	200-543-5
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**

THIOUR1000, THIOUR1001, THIOUR1002, THIOUR1003, THIOUR1004, THIOUR1005, THIOUR1006, THIOUR1007, THIOUR1008, THIOUR1009, THIOUR1010, THIOUR1011, THIOUR1012, THIOUR1013, THIOUR1014, THIOUR1015, THIOUR1016, THIOUR1017, THIOUR1018, THIOUR1019, THIOUR1020, THIOUR1500, THIOUR1600, THIOUR2000, THIOUR2001, THIOUR2002, THIOUR2003, THIOUR2500, THIOUR2501, THIOUR2502, THIOUR2503, THIOUR2504, THIOUR2505, THIOUR2506, THIOUR2507, THIOUR2508, THIOUR2509, THIOUR2510, THIOUR2511, THIOUR2512, THIOUR2513, THIOUR2514, THIOUR2515, THIOUR2516, THIOUR2517, THIOUR2518, THIOUR2519, THIOUR2520, THIOUR2521, THIOUR2522, THIOUR2523, THIOUR2524, THIOUR2525, THIOUR2526, THIOUR2527, THIOUR2528, THIOUR2600, THIOUR3000, THIOUR3001, THIOUR3002, THIOUR3003, THIOUR3004, THIOUR3010, THIOUR3200, THIOUR3500, THIOUR4000, THIOUR4001, THIOUR4100, THIOUR4200, THIOUR4300, THIOUR4500, THIOUR5000, THIOUR6000, THIOUR6500, THIOUR6501, THIOUR6502, THIOUR6503, THIOUR6600, THIOUR6650, THIOUR7000, THIOUR7001, THIOUR7002, THIOUR7005, THIOUR7006, THIOUR7010, THIOUR7020, THIOUR7100, THIOUR7200, THIOUR7500, THIOUR7501, THIOUR8000

Revision

5

Revision Date

09 Mar 2022

Key/Legend

< Less Than

> Greater Than

AICS Australian Inventory of Chemical Substances**atm** Atmosphere**CAS** Chemical Abstracts Service (Registry Number)**cm²** 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/cm³** 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/m³** 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**m³** Cubic Metre**mbar** Millibar**mg** Milligram**mg/24H** Milligrams per 24 Hours**mg/kg** Milligrams per Kilogram**mg/m³** 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