

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Thiourea

Product Use: For Commercial Use

Synonyms: Thiocarbamide, isothiourea, 2-thiourea

Supplier Information

Chem One Ltd.

14140 Westfair East Drive

Houston, Texas 77041-1104

Phone: (713) 896-9966

Fax: (713) 896-7540

Emergency # (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
62-56-6	Thiourea	> 99

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

*** Section 3 - Hazards Identification ***

Emergency Overview

Thiourea is a white crystalline solid which is odorless and has a bitter taste. Harmful or fatal if swallowed. May cause irritation of the eyes, skin and gastrointestinal tract. May cause allergic skin reactions. Fire may produce irritating and/or toxic vapors. Firefighters should use full protective equipment and clothing.

Hazard Statements

CAUTION! HARMFUL IF SWALLOWED. MAY CAUSE ALLERGIC SKIN REACTIONS. POSSIBLE BIRTH DEFECT HAZARD. MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Can cause irritation of eyes and skin. May cause respiratory tract irritation, and, in extreme cases, ulceration and perforation of the respiratory tract. Avoid contact with eyes and skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Keep from contact with clothing and other combustible materials.

Potential Health Effects: Eyes

Exposure to particulates or solutions of this product may cause redness, pain and tearing.

Potential Health Effects: Skin

This product may cause irritation of the skin with pain, itching and redness. Prolonged or repeated exposure may cause allergic skin reaction.

Potential Health Effects: Ingestion

Harmful if swallowed. May cause gastrointestinal irritation with symptoms such as nausea, vomiting, and diarrhea. Ingestion can result in changes in blood cell count, suppression of the bone marrow, hemorrhage and tumors.

Potential Health Effects: Inhalation

May irritate the nose, throat and respiratory tract. Symptoms can include sore throat, coughing and shortness of breath.

Overexposure from inhalation can result in symptoms such as those described for ingestion.

HMIS Ratings: Health Hazard: 2* Fire Hazard: 0 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water for at least 20 minutes. Seek immediate medical attention.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 4 - First Aid Measures (Continued) ***

First Aid: Ingestion

DO NOT INDUCE VOMITING. If swallowed, wash out mouth with water provided person is conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not flammable

Upper Flammable Limit (UEL): Not applicable

Auto Ignition: 440°C (824°F)

Rate of Burning: Not applicable

General Fire Hazards

Thiourea is not combustible. When involved in a fire, this material may decompose and produce toxic gases including oxides of sulfur, nitrogen and carbon.

Hazardous Combustion Products

Oxides of sulfur, nitrogen and carbon.

Extinguishing Media

Use methods for surrounding fire.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self-contained breathing apparatus. Runoff from fire control or dilution water may be toxic and cause pollution.

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Small releases can be cleaned-up wearing gloves, goggles and suitable body protection. In case of a large spill (in which excessive dusts can be generated), clear the affected area, protect people, and respond with trained personnel. Do not allow the spilled product to enter public drainage system or open water courses. Place all spill residues in an appropriate container and seal. Thoroughly wash the area after a spill or leak clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and laundry before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

*** Section 7 - Handling and Storage ***

Handling Procedures

All employees who handle this material should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. (continued on following page)

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 7 - Handling and Storage (Continued) ***

Storage Procedures (continued)

Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers, which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Follow the applicable exposure limits.

B: Component Exposure Limits

The exposure limits given are for Particulates Not Otherwise Classified.

ACGIH: 10 mg/m³ TWA (Inhalable fraction)

3 mg/m³ TWA (Respirable fraction)

OSHA: 15 mg/m³ TWA (Total dust)

5 mg/m³ TWA (Respirable fraction)

DFG MAKs 4 mg/m³ TWA (Inhalable fraction)

1.5 mg/m³ TWA (Respirable fraction)

Engineering Controls

Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent Standards of Canada. Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields (or goggles) and a face shield, if this material is made into solution. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear impervious gloves, boots and coveralls to avoid skin contact. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998). If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection.

Personal Protective Equipment: General

Have an eyewash fountain and safety shower available in the work area.

*** Section 9 - Physical & Chemical Properties ***

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance: White crystals

Odor: Odorless

Physical State: Solid

pH: Basic

Vapor Pressure: 7.5 x 10⁻⁸ mm Hg at 20°C (68 deg F)

Vapor Density: 2.6 (at 760 mm Hg)

Boiling Point: Decomposes

Freezing/Melting Point: 175-177 deg C (347 deg-350.6 deg F)

Solubility (H2O): 0.9 g/100 mL at 20 deg C

Specific Gravity: 1.41

Point: Not available

Particle Size: Not available

Softening Point: Not available

Bulk Density: Not available

Percent Volatile 0 (at 21 deg C)

Molecular Weight: 76.12

Chemical Formula: NH₂CSNH₂

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under normal temperature and atmospheric conditions. .

Chemical Stability: Conditions to Avoid

Avoid high temperatures, production of dust and incompatible materials. Do not expose this compound to direct sunlight.

Incompatibility

Incompatible with acrolein, acryaldehyde, hydrogen peroxide, nitric acid and strong oxidizing agents. The solid peroxide produced by action of hydrogen peroxide and nitric acid on Thiourea (and possibly a hydrogen peroxidate of Thiourea dioxide) can decompose violently on drying in air, with evolution of sulfur dioxide and free sulfur. Thiourea reacts with various sulfhydryl-oxidizing agents; complexes and adducts with organic compound protein and certain hydrocarbons.

Acrolein polymerizes with release of heat on contact with Thiourea.

Hazardous Decomposition

Sulfur, nitrogen, ammonia and carbon oxides.

Hazardous Polymerization

Polymerization can occur in contact with acryaldehyde.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

Harmful if swallowed or inhaled. Product is an eye and skin irritant and can cause allergic skin reaction. Long term overexposure to Thiourea has been shown to cause cancer in animals and may cause reproductive damage in humans. Chronic exposure can cause anemia, leukopenia, thrombocytopenia, liver tumors, bone marrow depression and hypothyroidism.

B: Component Analysis - LD50/LC50

Thiourea:

Oral-Rat LD₅₀: 125 mg/kg

B: Component Analysis - TDLo/LDLo

Thiourea:

Oral-Rat TDLo: 4800 mg/kg (female 17-22 days post): Teratogenic effects; Oral-Rat TDLo: 1 g/kg (female 12 days post): Reproductive effects; Oral-Rat TDLo: 78 g/kg/56 weeks-continuous: Carcinogenic effects; Multiple-Rat TDLo: 151 g/kg/52 weeks-intermittent: Carcinogenic effects; Oral-Rat TD: 18 g/kg/2 years-continuous: Neoplastic effects; Oral-Rat TD: 40 g/kg/2 years-continuous: Equivocal tumorigenic agent; Oral-Rat TD: 1950 mg/kg/2 years-continuous: Equivocal tumorigenic agent; Multiple-Rat TD: 179 g/kg/1 years-intermittent: Equivocal tumorigenic agent; Oral-Rat TD: 90 g/kg/1 years-intermittent: Equivocal tumorigenic agent; Oral-Woman TDLo: 1660 mg/kg/5 weeks: Blood effects; Unreported-Man LDLo: 147 mg/kg; Eye effects-Rabbit, adult 14%

Mutation in Microorganisms-Salmonella typhimurium 150 mg/plate; DNA Inhibition-Human: lymphocyte 20 mmol/L

Carcinogenicity

A: General Product Information

Studies have found that Thiourea directly interacts with the DNA strands. It has been shown that Thiourea produces cancer in laboratory animals. Conclusions regarding carcinogenicity in humans cannot be made.

B: Component Carcinogenicity

Thiourea

NTP: Class R (Reasonably Anticipated to be a Human Carcinogen)

MAK: Class 3B (Substances for which in vitro tests or animal studies have yielded evidence of carcinogenic effects that is not sufficient for classification of the substance in one of the other categories. Further studies are required before a final classification can be made.)

IARC: Group 3 (Unclassifiable as to Carcinogenicity in Humans)

Epidemiology

Thiourea was observed to cause tumors in the liver, lungs, ears, skin, eyes and thyroid of rats.

Neurotoxicity

Has not been identified.

Mutagenicity

DNA inhibition studies in human's fibroblasts, lymphocytes and Hela cells have shown to produce abnormalities.

Teratogenicity

Morphological transformations have been observed in test animals exposed to Thiourea. Developmental abnormalities of the musculo-skeletal and central nervous system were observed in test animals.

***** Section 11 - Toxicological Information (Continued) *******Other Toxicological Information**

Thiourea has been shown to produce reproductive effects in laboratory animals.

***** Section 12 - Ecological Information *******Ecotoxicity****A: General Product Information**

Harmful to aquatic life in very low concentrations. Thiourea is toxic to fish and marine organisms when applied to streams, rivers, ponds or lakes.

***** Section 12 - Ecological Information (Continued) *******Ecotoxicity (continued)****B: Ecotoxicity****Thiourea:**

No effect (*Selenastrum capricornutum*) = 1–10 mg/L; Inhibitory (*Selenastrum capricornutum*) = 100 mg/L; BCF (*Chlorella fusca* (wet wt.)) = 54; LC₅₀ (*Daphnia magna*) = 1.8 mg/L; LC₅₀ (*Pimephales promelas*) = >100 mg/L

Environmental Fate**Thiourea:**

Log K_{ow} = -1.02, Water solubility: 9 g/L (20°C)

Biodegradation: A 3% degradation was measured using the OECD-Screening Test. A 5-day German GSF Biodegradation Test resulted in 17% CO₂ evolution; a 27-day Zahn Wellens test resulted in no degradation; a 28-day modified OECD-screening test resulted in 3% degradation. Using the Warburg technique, a concentration of 500 mg/L Thiourea was found to be toxic, or very poorly oxidized by various activated sludges. In studies using sterilized versus non-sterilized soils, microorganisms were believed to take an active part in the transformation of thiourea, although high initial concentration of Thiourea suppressed microflora activity for a period of up to 60 days. Thiourea was found to be degradation resistant by the Japanese MITI Test. Very little degradation was observed in a solution medium inoculated with sewage sludge.

Bioconcentration: A 24-hour static test BCF of 54 was measured in alga *Chlorella*. Based on a measured Log K_{ow} of -1.02 (2), the BCF can be estimated to be approximately 0.1. Based on a water solubility of 9 g/L at 20°C, the BCF can be estimated to be approximately 1.0.

***** Section 13 - Disposal Considerations *******US EPA Waste Number & Descriptions****A: General Product Information**

Thiourea, when regarded as a waste, is hazardous waste under 40 CFR 261.

B: Component Waste Numbers

Thiourea (62-56-6) RCRA waste number U219.

Disposal Instructions

All wastes must be handled in accordance with local, state and federal regulations.

***** Section 14 – Transportation Information Ground *****

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under 49 CFR, IATA and IMDG to assure regulatory compliance.

US DOT 49 CFR 100-185 Revised July 24, 2009 Information

UN/NA #: UN 2811

Shipping Name: Toxic solid, organic, n.o.s. (Thiourea)

Hazard Class: 6.1

Packing Group: III

Required Label(s): 6.1 (Toxic or PGIII)

RQ Quantity: For a single package less than the RQ of 10lb (4.54 kg), the RQ designation should be not be used.

Special Provisions 172.102: IB8, IP3

Packaging: 172.213

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

Additional Shipping Information

Limited Quantity Shipments: Shipments, except for air, need not be marked with the Proper Shipping Name of the contents, but shall be marked with the UN Number (2811) of the contents, preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg (66 pounds).

Small Quantities for Highway and Rail: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle. The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement of the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test requirements of 173.4(6) (i). The outside of the package must be marked with the statement **"This package conforms to 49 CFR 173.4 for domestic highway or rail transport only."**

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 1kg (2.2 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet a drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "**" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm (3.9 inches) x 100 mm (3.9 inches), and must be durable and clearly visible.

De minimis Exceptions: The maximum quantity of this material per inner receptacle is limited to 1g (0.04 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 100 g (0.22 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce and may be transported by aircraft. If all of the above requirements are met, then this material is not regulated.

*** Section 14 – Transportation Information Air ***

50th Edition International Air Transport Association (IATA):

For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country.

UN/NA #: UN 2811

Proper Shipping Name: Toxic solid, organic, n.o.s. (Thiourea)

Hazard Class: 6.1

Packaging Group: III

Passenger & Cargo Aircraft Packing Instruction: 619

Passenger & Cargo Aircraft Maximum Net Quantity: 100 kg

Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y616

Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 10 kg

Cargo Aircraft Only Packing Instruction: 619

Cargo Aircraft Only Maximum Net Quantity: 200kg

Excepted Quantities: E1

Special Provisions: None

ERG Code: 6L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name Toxic solid, organic, n.o.s. (Thiourea) and shall be marked with the UN Number (2811) preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg.

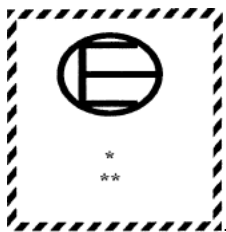
Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1kg. The inner receptacles must be securely packed in an intermediate

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "***" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

*** SECTION 14 – Transportation Information Vessel ***

Amendment 34-08 International Maritime Dangerous Goods (IMDG) Code

For shipments via marine vessel transport, the following classification information applies.

UN/NA #: UN 2811

Proper Shipping Name: TOXIC SOLID, ORGANIC, N.O.S. (Thiourea)

Hazard Class: Class 6.1

Packing Group: III

Special Provisions: 223, 274

Limited Quantities: 5kg

Excepted Quantities: E1

Packing Instructions: P002

Provisions: None

IBC Instructions: IBC08

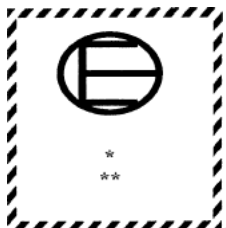
IBC Provisions: IBC08, B3

EmS: F-A, S-A

Stowage and Segregation: Category A

Limited Quantity Shipments: Shipments for vessel need not be marked with the Proper Shipping Name but shall be marked with the UN Number (2811) preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1000g. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 3.5.3.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:



NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "***" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 15 – Regulatory Information ***

US Federal Regulations

A: General Product Information

No information available.

US Federal Regulations (continued)

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4):

Thiourea (62-56-6)

SARA 302 There are no specific Threshold Planning Quantities for Thiourea. The default Federal MSDS submission and (EHS TPQ) inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

SARA 313: Yes

CERCLA: final RQ = 10 lb (4.54 kg)

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Thiourea	62-56-6	No	No	No	Yes	Yes

State Regulations

A: General Product Information

California Proposition 65

Thiourea is on the California Proposition 65 chemical lists. WARNING: This product contains a chemical known to the State of California to cause cancer.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Thiourea	62-56-6	No	Yes	Yes	No	Yes	Yes

Other Regulations

A: General Product Information

No other information available.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Thiourea	62-56-6	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

This product is listed under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Thiourea	62-56-6	0.1%

ANSI LABELING (Z129.1): **WARNING!** HARMFUL IF SWALLOWED. MAY CAUSE ALLERGIC SKIN REACTION. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. POSSIBLE BIRTH DEFECT HAZARD. MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

Material Safety Data Sheet

Material Name: Thiourea (Thiocarbamide)

ID: C1-159

*** Section 16 - Other Information ***

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD

Contact Phone: (713) 896-9966

Revision Log

09/19/00 3:37 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
06/02/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, SARA 311/312 ratings added.
08/20/01 5:12 PM CLJ Changed contact to Sue, non-800 Chemtrec Number.
11/1/02: 17:31 PM HDF Addition of chronic health hazard information. Addition of inhalation hazard information, Section 3. Section 4 – expansion of information on Information for Physicians. Up-graded Section 10 Reactivity Information. Up-Dated entire Section 14 Transportation Information to include IATA, IMO transport information.
09/08/03:5:35PM HDF General review of entire MSDS. Up-graded Section 10 Reactivity Information.
06/22/05 2:21 pm SEP Update IATA Section 14
09/05/06 2:16 PM SEP Update of DOT, IMO Section 14, modified "toxic" label as per Steve.
08/21/08 2:58 pm SEP Update Sect 14 DOT Required labels.
10/15/08 10:39 AM DLY Changed Chem One Physical Address, Section 1
09/18/09 MMK Updated Section 14 limited and excepted quantities and exceptions

This is the end of MSDS # C1-159