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----------ISO 9001: 2015----------

MATERIAL SAFETY DATA SHEET

1.Identification
1.1GHS Product identifier
Ethylene thiourea, 98%
Code E 1550

2.Hazard identification
2.1Classification of the substance or mixture
Acute toxicity - Oral, Category 4
Reproductive toxicity, Category 1B
2.2GHS label elements, including precautionary statements
Pictogram(s)

Signal word	Danger
Hazard statement(s)	H302 Harmful if swallowed
Precautionary statement(s)	
Prevention	P264 Wash ... thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response	P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/\u2026if you feel unwell. P330 Rinse mouth. P308+P313 IF exposed or concerned: Get medical advice/ attention.
Storage	P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3Other hazards which do not result in classification
none

3.Composition/information on ingredients
3.1Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
2-Imidazolidinethione	2-Imidazolidinethione	96-45-7	none	100%

4.First-aid measures
4.1Description of necessary first-aid measures
General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.
If inhaled
Fresh air.
In case of skin contact
Rinse skin with plenty of water or shower.
In case of eye contact
Rinse with plenty of water (remove contact lenses if easily possible).
If swallowed
Rinse mouth. Seek medical attention if you feel unwell.
4.2Most important symptoms/effects, acute and delayed
Exposure Routes: inhalation, ingestion, skin and/or eye contact Symptoms: Irritation eyes Target Organs: Eyes, skin, thyroid, reproductive system (NIOSH, 2016)
4.3Indication of immediate medical attention and special treatment needed, if necessary
/SRP:/ Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if

necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Poisons A and B/

5.Fire-fighting measures
5.1Extinguishing media
Suitable extinguishing media
Use dry chemical, carbon dioxide, water spray, or foam extinguishers ... If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors or shows any signs of deforming), withdraw immediately to a secure position.
5.2Specific hazards arising from the chemical
This chemical is combustible.
5.3Special protective actions for fire-fighters
Wear self-contained breathing apparatus for firefighting if necessary.

6.Accidental release measures
6.1Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.
6.2Environmental precautions
Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered sealable containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.
6.3Methods and materials for containment and cleaning up
SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

7.Handling and storage
7.1Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use.Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.
7.2Conditions for safe storage, including any incompatibilities
Separated from strong oxidants. Store in an area without drain or sewer access.Store in tightly closed containers in a cool, well ventilated area away from strong oxidizers, acids, acid anhydrides, acrolein. Store in a refrigerator or a cool, dry place. A regulated marked area should be established where this chemical is handled, used, or stored ...

8.Exposure controls/personal protection
8.1Control parameters
Occupational Exposure limit values
NIOSH considers ethylene thiourea to be a potential occupational carcinogen.
NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration.
Use encapsulated form.
Biological limit values
no data available
8.2Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
8.3Individual protection measures, such as personal protective equipment (PPE)
Eye/face protection
Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin protection
Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique(without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
Respiratory protection
Wear dust mask when handling large quantities.
Thermal hazards
no data available

9.Physical and chemical properties
Physical state White to pale green crystalline powder

Colour	Needles, prisms from alcohol or amyl alcohol
Odour	Faint, amine odor
Melting point/ freezing point	15\u00b0C(lit.)
Boiling point or initial boiling point and boiling range	275\u00b0C(lit.)
Flammability	Combustible SolidCombustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	61\u00b0C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	In water:19 g/L (20 \u00baC)
Partition coefficient n-octanol/water (log value)	log Kow = -0.66
Vapour pressure	less than 1 mm Hg at 20\u00b0C
Density and/or relative density	1.41~1.45
Relative vapour density	no data available
Particle characteristics	no data available

10.Stability and reactivity
10.1Reactivity
no data available
10.2Chemical stability
Stable under recommended storage conditions.
10.3Possibility of hazardous reactions
Dust explosion possible if in powder or granular form, mixed with air.ETHYLENE THIOUREA may be sensitive to prolonged exposure to light. Incompatible with acids, diazo and azo compounds, halocarbons, isocyanates, aldehydes, alkali metals, nitrides, hydrides, and other strong reducing agents. Reactions with these materials generate heat and in many cases hydrogen gas. May react with acids to liberate hydrogen sulfide.
10.4Conditions to avoid
no data available
10.5Incompatible materials
Strong oxidizers, acids, acid anhydrides, acrolein.
10.6Hazardous decomposition products
When heated to decomposition it emits very toxic fumes of /nitroxides/ and /sulfoxides/.

11.Toxicological information
Acute toxicity
Oral: LD50 Rat oral 545 mg/kg bw
Inhalation: no data available
Dermal: no data available
Skin corrosion/irritation
no data available
Serious eye damage/irritation
no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
no data available
Carcinogenicity
Cancer Classification: Group B2 Probable Human Carcinogen
Reproductive toxicity
In an occupational study, reproductive or developmental effects were not observed in humans. Ethylene thiourea has been shown to be a potent teratogen in rats orally or dermally exposed, causing CNS and skeletal abnormalities.
STOT-single exposure
no data available
STOT-repeated exposure
no data available
Aspiration hazard
no data available

12.Ecological information
12.1Toxicity
Toxicity to fish: EC50; Species: Oncorhynchus mykiss (Rainbow trout, fertilized egg- early fry stage); Conditions: freshwater, renewal, 10\u00b0C, pH 7.7, hardness 50 mg/L CaCO3; Concentration: 1000000 ug/L for 60 days (95% confidence interval: 600000-3200000 ug/L); Effect: morphological abnormalities /> or =99% purity

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water flea); Conditions: freshwater, renewal; Concentration: 26400 ug/L for 48 hr (95% confidence interval: 21600-32200 ug/L) /99% purity
Toxicity to algae: no data available
Toxicity to microorganisms: no data available
12.2Persistence and degradability
AEROBIC: Ethylene thiourea was found to be readily degraded by soil microorganisms(1). Ethylene thiourea degraded rapidly in soil to ethyleneurea and then CO2; however, studies with autoclaved soil indicated that initial conversion was accomplished chemically(2) while further degradation to CO2 was accomplished microbially(3). Ethylene thiourea was shown to be biodegradable in aerobic soil samples from a sandy locality in western Jylland, Denmark at a concentration 125 ug/L incubated in the dark at 23\u00b0C for 120 days(4). Aerobic decay rates were 11.4 to 13.3 ug/kg soil-day(4). Degradation of 0.07 mg/kg 14C-labeled ethylene thiourea was determined in surface (19% in 24 hrs) coarse sandy field soil from Denmark(5). Subsurface rates were affected by soil depth; 16% and 23% at 100 and 60 cm depth, respectively, after 109 days. Following a 5 day incubation of 0.05 mg/L ethylene thiourea in activated sludge, 2.9% of applied amount was degraded(5). Ethylene thiourea, present at 100 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test(6).
12.3Bioaccumulative potential
BCFs of <0.2 to 0.3 and <1.8 were determined in carp (Cyprinus carpio) for ethylene thiourea at concentrations of 1.0 and 0.1 ppm exposed for 6 weeks(1). According to a classification scheme(2), these BCFs suggest bioconcentration in aquatic organisms is low(SRC).
12.4Mobility in soil
Using a structure estimation method based on molecular connectivity indices(1), the Koc of ethylene thiourea can be estimated to be 13(SRC). According to a classification scheme(2), this estimated Koc value suggests that ethylene thiourea is expected to have very high mobility in soil. Average Rf values of 0.96 (Norfolk sandy loam), 1.00 (Lakeland sandy loam), 0.96 (Hagerstown silty clay loam), 0.83 (Barnes clay loam) and 0.61 (Celeryville muck) were measured using soil TLC plates which is indicative of high mobility in all the soils except the muck which has intermediate mobility(3). Ethylene thiourea Kd values were measured in Dutch soils from Fladerne Baek, March 1994; 0.06 (2.1% clay, 1.4% silt, 96.3% sand, 0.1% humus, pH 6.4), 0.13 (2.5% clay, 1.4% silt, 95.7% sand, 0.3% humus, pH 6.3), 0.17 (3.6% clay, 2.8% silt, 90.8% sand, 2.8% humus, pH 6.9)(4).
12.5Other adverse effects
no data available

13.Disposal considerations
13.1Disposal methods
Product
The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.
Contaminated packaging
Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14.Transport information
14.1UN Number
ADR/RID: UN1325 IMDG: UN1325 IATA: UN1325
14.2UN Proper Shipping Name
ADR/RID: FLAMMABLE SOLID, ORGANIC, N.O.S.
IMDG: FLAMMABLE SOLID, ORGANIC, N.O.S.
IATA: FLAMMABLE SOLID, ORGANIC, N.O.S.
14.3Transport hazard class(es)
ADR/RID: 4.1 IMDG: 4.1 IATA: 4.1
14.4Packing group, if applicable
ADR/RID: III IMDG: III IATA: III
14.5Environmental hazards
ADR/RID: no IMDG: no IATA: no
14.6Special precautions for user
no data available
14.7Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
no data available

15.Regulatory information
15.1Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
2-Imidazolidinethione	2-Imidazolidinethione	96-45-7	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.