Chemical Safety Data Sheet MSDS / SDS

Methyl isothiocyanate SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: Methyl isothiocyanate

CAS: 556-61-6

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Acute toxicity - Category 3, Oral
Skin corrosion, Sub-category 1B

Skin sensitization, Category 1
Acute toxicity - Category 3, Inhalation
Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H301 Toxic if swallowed
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H331 Toxic if inhaled
H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response

P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P363 Wash contaminated clothing before reuse.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P333+P317 If skin irritation or rash occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P391 Collect spillage.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Methyl isothiocyanate
Common names and synonyms:	Methyl isothiocyanate
CAS number:	556-61-6
EC number:	209-132-5
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a

doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Very toxic; probable human oral lethal dose is 50-500 mg/kg, or between 1 teaspoonful and 1 oz. for a 70 kg (150 lb.) person. Highly irritating to skin, mucous membrances, and eyes. Human oral minimum lethal dose: approximately 1 g/kg. (EPA, 1998)

Indication of immediate medical attention and special treatment needed, if necessary

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 as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on 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. Isocyanates, aliphatic thiocyanates, and related compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

Evacuation: If fire becomes uncontrollable or container is exposed to direct flame - consider evacuation of one-third (1/3) mile radius.

Specific hazards arising from the chemical

Non-Specific -- Pesticide, Solid, n.o.s.) This material may burn, but does not ignite readily. Fire may produce irritating or poisonous gases. When heated it emits very dangerous cyanides and sulfur compounds. Do not store below -4F or at elevated temperatures. Keep away from sparks. (EPA, 1998)

Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours.Avoid contacting with skin and eye. Use personal protective equipment.Wear chemical impermeable gloves. Ensure adequate ventilation.Remove all sources of ignition. Evacuate personnel to safe areas.Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Decontamination of spilled isocyanates and disposal of isocyanate waste are best conducted by using aqueous ammonia (3-8% concentrated ammonia solution in 90-95% water with 0.2-5% liquid detergent) or aqueous sodium carbonate (5-10% sodium carbonate in 90-95% water and 0.2-5% liquid detergent). An alcoholic solution (50% ethanol, isopropyl alcohol, or butanol; 45% water; and 5% concentrated ammonia) may be preferred because of the low miscibility of isocyanates with water. Isocyanates

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Store only in closed original container to prevent leakage. Store only in cool, well-ventilated, locked areas, away form food and feedstuff, out of reach of children and irresponsible persons. Avoid exposure to heat and/or direct sunlight. Do not drop container onto or slide across sharp objects. MLPC Methylisothiocyanate (MITC)

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. 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

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Methyl isothiocyanate is a colorless liquid with a sharp odor. Lethal by inhalation of even small quantities of vapor. Does not have odor warning characteristics at low concentrations. Do not rely on the sense of smell to warn about the presence of vapors. Denser than water. May cause tearing and irritate the eyes, skin, nose and throat.

Colour:	Colorless crystals
Odour:	Horseradish-like odor
Melting point/freezing point:	110°C(lit.)
Boiling point or initial boiling point and boiling range:	117°C
Flammability:	no data available
Lower and upper explosion limit/flammability limit:	Lower 2.5%; Upper 30%. /MITC-Fume/
Flash point:	35°C
Auto-ignition temperature:	698 deg F. /MITC-Fume/
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	Readily soluble in common organic solvents, such as ethanol, methanol, acetone, cyclohexanone, dichloromethane, chloroform, carbon tetrachloride, benzene, xylene, petroleum ether, and mineral oils.
Partition coefficient n-octanol/water:	log Kow = 0.94
Vapour pressure:	21 mm Hg (20 °C)
Density and/or relative density:	1.069
Relative vapour density:	2.53 (Air = 1)

Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Highly flammable. Methyl isothiocyanate reacts with water to form carbon dioxide and methylamine gases.

Chemical stability

no data available

Possibility of hazardous reactions

FlammableIsocyanates and thioisocyanates, such as METHYL ISOTHIOCYANATE, are incompatible with many classes of compounds, reacting exothermically to release toxic gases. Reactions with amines, aldehydes, alcohols, alkali metals, ketones, mercaptans, strong oxidizers, hydrides, phenols, and peroxides can cause vigorous releases of heat. Acids and bases initiate polymerization reactions in these materials. Some isocyanates react with water to form amines and liberate carbon dioxide. Polyurethanes are formed by the condensation reaction of diisocyanates with, for example, ethyl glycol.

Conditions to avoid

no data available

Incompatible materials

Can react vigorously with oxidizing materials.

Hazardous decomposition products

When heated to decomposition it emits very toxic fumes of /nitrogen oxides & sulfur oxides/.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Mouse oral 97 mg/kg

Inhalation: LC50 Rat inhalation 1,900 mg/cu m/1 hr

Dermal: LD50 Mouse male percutaneous 1870 mg/kg

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

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: Lepomis macrochirus (Bluegill) age 4 months; Conditions: freshwater, flow through; Concentration: 142 ug/L for 96 hr (95% confidence interval: 88-250 ug/L) /94.9% pure formulation

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water Flea) age <24 hr; Conditions: freshwater, flow through; Concentration: 55 ug/L for 48 hr; Effect: intoxication, immobilization /95% pure formulation

Toxicity to algae: EC50; Species: Scenedesmus subspicatus (Green Algae); Conditions: freshwater, static; Concentration: 254 ug/L for 96 hr (95% confidence interval: 218-296 ug/L); Effect: population abundance /95.7% pure formulation

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: In a soil biodegradation study, the biodegradation of methyl isothiocyanate generally followed first order kinetics in soils previously untreated with the compound(1). In soils previously exposed to methyl isothiocyanate, the biodegradation was generally much faster and the biodegradation did not follow first order kinetics(1). Even in soils that were previously untreated with methyl isothiocyanate, an accelerated transformation (which did follow first order kinetics) was observed after an initial period (8-15 days) of first order transformation(1). Using the first order kinetics, the biodegradation half-life was estimated to range from 0.5 to 50 days(2). Generally, the transformation was appreciably faster in soils that have been previously treated with the chemical frequently(2). At or above concentrations of 0.8 mg/L, methyl isothiocyanate inhibited nitrification in the activated sludge process of sewage disposal(2). Methyl isothiocyanate was confirmed to be biodegradable according to a Netherlands study that employed 10 soils under field conditions(3). Soil core samples from Dutch agricultural fields with a 4 year history of methyl isothiocyanate treatment were incubated with the test compound for 1 to 14 days at 20 deg C; 50% degradation times ranged from 0.5 to 9 days(3). In the laboratory, it was observed that methyl isothiocyanate biodegradation is influenced by factors such as nursery history, fumigant application rates, and freshness of tested soils(4). Methyl isothiocyanate, applied at 195-780 kg/hectacre and incubated at 22 deg C, exhibited half-lives of 3.14-11.20 days in Hayward, WI forest soils; half-lives in 3 Byromville, GA nursery soils ranged from 3.38-4.61 days(4).

Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for methyl isothiocyanate(SRC), using a log Kow of 0.94(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

The Koc of methyl isothiocyanate ranges from 3 to 14.5(1-4). According to a classification scheme(5), this Koc range suggests that methyl isothiocyanate is expected to have very high mobility in soil(SRC). Methyl isothiocyanate was shown to leach readily using

repacked soil columns; nearly all the applied solution was recovered in the leachate(6). Using a soil column study that simulated environmental Moroccan conditions (0.84% organic matter, pH 7.6, 12.5% moisture, 4.28% clay, 12.32% loam, 83.41% sand), methyl isothiocyanate was shown to concentrate at the 0-40 cm soil layer within 24 hours(7).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal 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.

SECTION 14: Transport information

UN Number

ADR/RID: UN2477 (For reference only, please check.)
IMDG: UN2477 (For reference only, please check.)
IATA: UN2477 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: METHYL ISOTHIOCYANATE (For reference only, please check.)
IMDG: METHYL ISOTHIOCYANATE (For reference only, please check.)
IATA: METHYL ISOTHIOCYANATE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)
IATA: 6.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: I (For reference only, please check.)
IMDG: I (For reference only, please check.)
IATA: I (For reference only, please check.)

Environmental hazards

ADR/RID: Yes
IMDG: Yes
IATA: Yes

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

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

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/