

## Chemical Safety Data Sheet MSDS / SDS

**Methyl isothiocyanate**

Revision Date:2024-03-16 Revision Number:1

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

Product name : Methyl isothiocyanate  
CBnumber : CB6455336  
CAS : 556-61-6  
EINECS Number : 209-132-5  
Synonyms : MIT, isothiocyanatomethane

**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  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

**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

**Label elements****Pictogram(s)**

☐☐

Signal word : Danger

**Hazard statement(s)**

H301 Toxic if swallowed  
H310 Fatal in contact with skin  
H314 Causes severe skin burns and eye damage

H317 May cause an allergic skin reaction

H331 Toxic if inhaled

H400 Very toxic to aquatic life

H410 Very toxic to aquatic life with long lasting effects

#### **Precautionary statement(s)**

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

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P405 Store locked up.

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

#### **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**

no data available

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## SECTION 3: Composition/information on ingredients

### Substance

Product name	: Methyl isothiocyanate
Synonyms	: MIT, isothiocyanatomethane
CAS	: 556-61-6
EC number	: 209-132-5
MF	: C <sub>2</sub> H <sub>3</sub> NS
MW	: 73.12

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## SECTION 4: First aid measures

### Description of 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 and effects, both 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 membranes, and eyes. Human oral minimum lethal dose: approximately 1 g/kg. (EPA, 1998)

### Indication of any immediate medical attention and special treatment needed

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

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## SECTION 5: Firefighting measures

### Extinguishing media

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

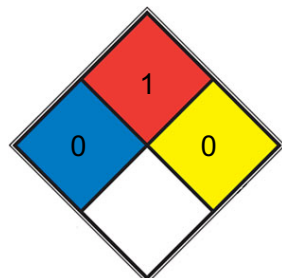
### Specific Hazards Arising from the Chemical

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)

### Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

### NFPA 704



HEALTH 0 Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials

FIRE 1 Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. [mineral oil](#), ammonia)

REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N<sub>2</sub>](#))

SPEC.

HAZ.

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## 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

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## 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 from 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)

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# SECTION 8: Exposure controls/personal protection

## Control parameters

### Occupational Exposure limit values

no data available

### Biological limit values

no data available

## Exposure 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

### 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

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# SECTION 9: Physical and chemical properties

## Information on basic physicochemical properties

Physical state Low Melting Solid

Colour White to pale yellow

Odour Horseradish-like odor

Melting point/freezing point 110°C(lit.)

Boiling point or initial boiling point and boiling range 117°C

boiling range

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	H2O: slightly soluble
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

Flammable isocyanates 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

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## 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/hectare 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

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## 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.

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## 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

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## 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.

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# 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](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/>

### Disclaimer:

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