

# SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0  
Creation Date: Aug 13, 2017  
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## 1. Identification

### 1.1 GHS Product identifier

Product name malononitrile

### 1.2 Other means of identification

Product number -  
Other names Propanedinitrile

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses For industry use only. Intermediates  
Uses advised against no data available

### 1.4 Supplier's details

Company Echemi.com  
Address Echemi.com  
Telephone Echemi.com  
Fax Echemi.com

### 1.5 Emergency phone number

Emergency phone number Echemi.com  
Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

## 2. Hazard identification

### 2.1 Classification of the substance or mixture

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

### 2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H301 Toxic if swallowed  
H311 Toxic in contact with skin  
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.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.  
P271 Use only outdoors or in a well-ventilated area.  
P273 Avoid release to the environment.  
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/...  
P321 Specific treatment (see ... on this label).  
P330 Rinse mouth.  
P302+P352 IF ON SKIN: Wash with plenty of water/...  
P312 Call a POISON CENTER/doctor/... if you feel unwell.  
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P311 Call a POISON CENTER/doctor/...  
P391 Collect spillage.  
P405 Store locked up.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.  
P501 Dispose of contents/container to ...

Response

Storage

Disposal

### 2.3 Other hazards which do not result in classification

none

## 3. Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
malononitrile	malononitrile	109-77-3	none	100%

## 4. First-aid measures

### 4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention. Half-upright position.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

#### **In case of eye contact**

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

#### **If swallowed**

Rinse mouth. Give a slurry of activated charcoal in water to drink. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Give one or two glasses of water to drink. Refer for medical attention .

### **4.2 Most important symptoms/effects, acute and delayed**

Metabolized by body to cyanide and thiocyanate; effects of inhalation of toxic fumes will be related to cyanide. Causes brain and heart damage related to lack of cellular oxygen. It is classified as extremely toxic. Probable oral lethal dose for humans is 5-50 mg/kg, or between 7 drops and 1 teaspoonful, for a 70 kg (150 lb.) person. (EPA, 1998)

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

Rapid support of respiration and circulation is essential to successful treatment of cyanide intoxication. Massive cyanide overdoses have survived with only good supportive care. Immediate attention should be directed toward assisted ventilation, administration of 100% oxygen, insertion of intravenous lines, and institution of cardiac monitoring. Obtain an arterial blood gas immediately and correct any severe metabolic acidosis (pH below 7.15). Oxygen (100%) should be used routinely in moderate or severely symptomatic patients even in the presence of a normal pO<sub>2</sub>, since 100% O<sub>2</sub> increases O<sub>2</sub> delivery, may reactivate cyanide-inhibited mitochondrial enzymes, and potentiates the effect of thiosulfate. Avoid mouth to mouth resuscitation during CPR in order to prevent self poisoning. /Cyanides/

## **5.Fire-fighting measures**

### **5.1 Extinguishing media**

#### **Suitable extinguishing media**

To fight fire, use water, fog, spray, foam.

### **5.2 Specific hazards arising from the chemical**

When heated to decomposition, malononitrile emits highly toxic fumes (cyanide). May polymerize violently on prolonged heating. Avoid heat. Hazardous polymerization may occur, at prolonged heating at 266F or contact with strong bases at lower temperatures. (EPA, 1998)

### **5.3 Special protective actions for fire-fighters**

Wear self-contained breathing apparatus for firefighting if necessary.

## **6.Accidental release measures**

### **6.1 Personal 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.

### **6.2 Environmental precautions**

Remove all ignition sources. Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment. Vacuum spilled material with specialist equipment. If appropriate, moisten first to prevent dusting.

### **6.3 Methods and materials for containment and cleaning up**

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

## **7.Handling and storage**

### **7.1 Precautions 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.

### **7.2 Conditions for safe storage, including any incompatibilities**

Cool. Separated from strong bases and food and feedstuffs. Well closed. Keep in a well-ventilated room.

## **8.Exposure controls/personal protection**

### **8.1 Control parameters**

#### **Occupational Exposure limit values**

Recommended Exposure Limit: 10 Hr Time-Weighted avg: 3 ppm (8 mg/cu m).

#### **Biological limit values**

no data available

### **8.2 Appropriate engineering controls**

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### **8.3 Individual 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**

<b>Physical state</b>	Solidified melt
<b>Colour</b>	Colorless solid
<b>Odour</b>	no data available
<b>Melting point/ freezing point</b>	30-34°C
<b>Boiling point or initial boiling point and boiling range</b>	220°C
<b>Flammability</b>	Combustible SolidCombustible.

<b>Lower and upper explosion limit / flammability limit</b>	no data available
<b>Flash point</b>	112°C
<b>Auto-ignition temperature</b>	no data available
<b>Decomposition temperature</b>	no data available
<b>pH</b>	no data available
<b>Kinematic viscosity</b>	no data available
<b>Solubility</b>	In water: 13.3 g/100 mL (20 °C)
<b>Partition coefficient n-octanol/water (log value)</b>	log Kow = -0.60
<b>Vapour pressure</b>	0.125mmHg at 25°C
<b>Density and/or relative density</b>	1.049
<b>Relative vapour density</b>	(air = 1): 2.3
<b>Particle characteristics</b>	no data available

## 10. Stability and reactivity

### 10.1 Reactivity

no data available

### 10.2 Chemical stability

The stability of the molten nitrile decreases with increasing temperature and decreasing purity, but no violent decomposition at below 100°C has been recorded.

### 10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame. MALONONITRILE is a white, low-melting powder (m. p. 30.5° C), toxic, combustible. Violent polymerization on contact with strong bases (sodium hydroxide, potassium hydroxide) or when heated above 130° C. When stored at 70-80° C for 2 months, spontaneous explosion (decomposition) occurred [Bretherick, 5th ed., 1995, p. 394].

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Strong bases [Note: May polymerize violently on prolonged heating at 265 degrees F, or in contact with strong bases at lower temperatures].

### 10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of NO<sub>x</sub> and CN<sup>-</sup> /nitrogen oxides and cyanides/.

## 11. Toxicological information

### Acute toxicity

- Oral: LD50 Mouse oral 19 mg/kg
- 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

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

## 12. Ecological information

### 12.1 Toxicity

- Toxicity to fish: LC50 Rainbow trout 1.6 mg/l/96 hr /Conditions of bioassay not specified
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

### 12.2 Persistence and degradability

AEROBIC: Nitriles are biodegraded by enzyme-catalyzed hydrolysis to ultimately form carboxylic acids and ammonia(1,2). Thus, malononitrile may biodegrade in the environment(SRC).

### 12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for malononitrile(SRC), using a log Kow of -0.60(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).

### 12.4 Mobility in soil

The Koc of malononitrile is estimated as 11(SRC), using a measured log Kow of -0.60(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that malononitrile is expected to have very high mobility in soil(SRC).

### 12.5 Other adverse effects

no data available

## 13. Disposal considerations

## 13.1 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.

## 14. Transport information

### 14.1 UN Number

ADR/RID: UN2647

IMDG: UN2647

IATA: UN2647

### 14.2 UN Proper Shipping Name

ADR/RID: MALONONITRILE

IMDG: MALONONITRILE

IATA: MALONONITRILE

### 14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

### 14.4 Packing group, if applicable

ADR/RID: II

IMDG: II

IATA: II

### 14.5 Environmental hazards

ADR/RID: yes

IMDG: yes

IATA: yes

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

## 15. Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
malononitrile	malononitrile	109-77-3	none
<b>European Inventory of Existing Commercial Chemical Substances (EINECS)</b>			Listed.
<b>EC Inventory</b>			Listed.
<b>United States Toxic Substances Control Act (TSCA) Inventory</b>			Listed.
<b>China Catalog of Hazardous chemicals 2015</b>			Listed.
<b>New Zealand Inventory of Chemicals (NZIoC)</b>			Listed.
<b>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</b>			Listed.
<b>Vietnam National Chemical Inventory</b>			Not Listed.
<b>Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)</b>			Listed.

## 16. Other information

### Information on revision

Creation Date

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### 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)
- CAMERO 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/>

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