

According to the UN GHS revision 8

Creation Date: August 12, 2024

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1. IDENTIFICATION

1.1 GHS Product identifier

Product name: Metronidazole

Catalog Number: T1079

CAS Number: 443-48-1

1.2 Other means of identification

Other names: -

1.3 Recommended use of the chemical and restrictions on use

Identified uses: no data available

1.4 Supplier's details

Company: Targetmol Chemicals Inc.

Uses advised against: 36 Washington Street, Wellesley Hills, Massachusetts 02481 USA

Tel/Fax: (781) 999-4286

1.5 Emergency phone number

Emergency phone number: 781-999-4286

Service hours: Monday to Friday, 9am-5pm (Standard timezone: UTC/GMT -5hours).

2. HAZARD IDENTIFICATION

2.1 Classification of the substance or mixture

Germ cell mutagenicity, Category 2

Carcinogenicity, Category 1B

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3

2.2 GHS label elements, including precautionary statements

Pictogram(s):



Signal word: Danger

Hazard statement(s):
H341 Suspected of causing genetic defects
H350 May cause cancer
H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s):

Prevention:

P203 Obtain, read and follow all safety instructions before use.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P273 Avoid release to the environment.

Response:

P318 IF exposed or concerned, get medical advice.

Storage:

P405 Store locked up.

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.

2.3 Other hazards which do not result in classification

no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number
Metronidazole	-	443-48-1	207-136-1

4. FIRST-AID MEASURES

4.1 Description of necessary first-aid measures

General advice

no data available

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.

4.2 Most important symptoms/effects, acute and delayed

Maintain an open airway and assist ventilation if necessary. Treat coma, seizures, hypotension, anaphylaxis, and hemolysis if they occur. Replace fluid losses resulting from gastroenteritis with intravenous crystalloids. ... Administer activated charcoal. Gastric emptying is not necessary if activated charcoal can be given promptly. Most antibiotics are excreted unchanged in the urine, so maintenance of adequate urine flow is important. The role of forced diuresis is unclear. Hemodialysis is not usually indicated, except perhaps in patients with renal dysfunction and a high level of toxic agent. Antibacterial Agents

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

SYMPTOMS: Symptoms of exposure to this chemical may include nerve or sheath structural changes, eye changes, tremors, fever, jaundice and other liver changes. It may cause convulsive seizures, numbness, nausea, vomiting, abdominal discomfort, diarrhea, sharp, unpleasant metallic taste, erythematous rash, pruritus, dizziness, syncope, ataxia, thrombophlebitis after intravenous infusion, darkened urine, anorexia, epigastric distress, constipation, glossitis, stomatitis, reversible thrombocytopenia and vertigo. Flattening of the T-wave may be seen in electrocardiographic tracings. It may also cause incoordination, irritability, depression, weakness, insomnia, nasal congestion dysuria, cystitis, polyuria, incontinence, a sense of pelvic pressure, dyspareunia, decrease of libido, proctitis and fleeting joint pains sometimes resembling serum sickness. It may cause skin rash and drowsiness. Other symptoms of exposure include malaise, transient rashes, gastrointestinal disturbances and peripheral neuropathy. It may cause coated tongue, dry mouth, urethral discomfort, temporary leukopenia, increase in chromosome aberrations, candidal vaginitis, lethargy and sore furred tongue. In conjunction with alcohol it may provoke a disulfiram-like reaction. Pregnant women exposed to this compound have given birth to premature, stillborn infants. One infant has died of white asphyxia. It may cause epigastric distress, abdominal cramping, numbness or paresthesia of an extremity, urticaria, flushing, dryness of vagina or vulva, abdominal distress, headache (if ingested with alcohol), confusional and psychotic states, blood dyscrasias, temporary neutropenia which reverses after therapy, and low concentrations of lipids in plasma. **ACUTE/CHRONIC HAZARDS:** This compound is harmful by ingestion, inhalation or skin absorption. It may cause irritation. When heated to decomposition it emits toxic fumes of carbon monoxide, carbon dioxide and nitrogen oxides. (NTP, 1992)

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. (NTP, 1992)

5.2 Specific hazards arising from the chemical

Flash point data for this chemical are not available; however, it is probably combustible. (NTP, 1992)

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

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.

6.2 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.

6.3 Methods and materials for containment and cleaning up

PRECAUTIONS FOR "CARCINOGENS": A high-efficiency particulate arrestor (HEPA) or charcoal filters can be used to minimize amt of carcinogen in exhausted air ventilated safety cabinets, lab hoods, glove boxes or animal rooms ... Filter housing that is designed so that used filters can be transferred into plastic bag without contaminating maintenance staff is avail commercially. Filters should be placed in plastic bags immediately after removal ... The plastic bag should be sealed immediately ... The sealed bag should be labelled properly ... Waste liquids ... should be placed or collected in proper containers for disposal. The lid should be secured & the bottles properly labelled. Once filled, bottles should be placed in plastic bag, so that outer surface ... is not contaminated ... The plastic bag should also be sealed & labelled. ... Broken glassware ... should be decontaminated by solvent extraction, by chemical destruction, or in specially designed incinerators. Chemical Carcinogens

7. HANDLING AND STORAGE

7.1 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.

7.2 Conditions for safe storage, including any incompatibilities

PRECAUTIONS FOR "CARCINOGENS": Storage site should be as close as practical to lab in which carcinogens are to be used, so that only small quantities required for ... expt need to be carried. Carcinogens should be kept in only one section of cupboard, an explosion-proof refrigerator or freezer (depending on chemico-physical properties ...) that bears appropriate label. An inventory ... should be kept, showing quantity of carcinogen & date it was acquired ... Facilities for dispensing ... should be contiguous to storage area. Chemical Carcinogens

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 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.

8.3 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

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	PHYSICAL DESCRIPTION: White to pale-yellow crystalline powder with a slight odor. Bitter and saline taste. pH (saturated aqueous solution) about 6.5. (NTP, 1992)
Color	Cream-colored crystals
Odour	ODORLESS
Melting point/ freezing point	206°C(lit.)
Boilingpoint or initial boiling point and boiling range	254°C(lit.)
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	9°C
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	pH of saturated aq soln is 5.8
Kinematic viscosity	no data available
Solubility	Ethanol: < 1 mg/mL (insoluble or slightly soluble), DMSO: 60 mg/mL (350.55 mM),
N-octanol-water partition coefficient	no data available
Vapour pressure	2.67E-07mmHg at 25°C
Density and/ or relative density	1.45 g/cm ³
Relative vapour density	no data available
Particle characteristics	no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

no data available

10.2 Chemical stability

Stable in air but darkens on exposure to light.

10.3 Possibility of hazardous reactions

METRONIDAZOLE darkens on exposure to light. This chemical is incompatible with strong oxidizing agents. (NTP, 1992).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Because reconstituted metronidazole hydrochloride solution has a low pH, the solution may interact with aluminum resulting in a reddish-brown discoloration of the solution. Therefore, aluminum hub needles should not be used to reconstitute the drug or to transfer the reconstituted solution to the diluting fluid. Metronidazole hydrochloride that has been reconstituted, diluted, and neutralized and metronidazole injection do not interact with aluminum when administered over the time period specified by the manufacturers; however, some discoloration of these solutions may occur when they are in contact with aluminum for periods of 6 hours or longer.

10.6 Hazardous decomposition products

no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral: LD50 Albino Rat oral > 5 g/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

Metronidazole: reasonably anticipated to be a human carcinogen.

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 *Lepomis macrochirus* (Bluegill sunfish, weight 0.1g) >100 ppm/96 hr; static /99.4% AI formulated product

Toxicity to daphnia and other aquatic invertebrates: EC50 *Daphnia magna* (Water flea, age <24 hr; intoxication, immobilization) >1000 ppm/48 hr; static /99% AI formulated product

Toxicity to algae: EC50 *Pseudokirchneriella subcapitata* (Green algae; decreased population growth) 40.4 mg/L/72 hr (95% confidence limit: 2.17-750 mg/L); static

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: The biodegradation half-lives in sandy soil-manure slurry were 9.7 to 14.7 days and in clay soil-manure slurry were 13.1 to 26.9 days(1). Metronidazole was found to be non-degradable in sewage treatment conditions(2). Metronidazole did not degrade in closed bottle tests at concentrations of 5.95 ug/L and 5.95 mg/L(3).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for metronidazole(SRC), using a log Kow of -0.02(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 metronidazole is estimated as 23(SRC), using a log Kow of -0.02(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that metronidazole is expected to have very high mobility in soil.

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

no data available

14.2 UN Proper Shipping Name

no data available

14.3 Transport hazard class(es)

no data available

14.4 Packing group, if applicable

no data available

14.5 Environmental hazards

no data available

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

15. REGULATORY INFORMATION

15.1 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	Not 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.
Korea Existing Chemicals List (KECL)	Listed.

16. OTHER INFORMATION

Information on revision

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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
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/>

Other Information

no data available

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