

# SAFETY DATA SHEETS

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

Version: 1.0

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## 1. Identification

### 1.1 GHS Product identifier

Product name                    manganese atom

### 1.2 Other means of identification

Product number                -

Other names                    TRONAMANG(R)

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

Identified uses                For industry use only. Inorganic substances

Uses advised against        no data available

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## 2. Hazard identification

### 2.1 Classification of the substance or mixture

Not classified.

### 2.2 GHS label elements, including precautionary statements

Pictogram(s)                    No symbol.

Signal word                      No signal word.

Hazard statement(s)           none

Precautionary  
statement(s)

Prevention                        none

Response  
none

Storage  
none

Disposal  
none

## 2.3 Other hazards which do not result in classification

none

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## 3. Composition/information on ingredients

### 3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
manganese atom	manganese atom	7439-96-5	none	100%

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## 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. Refer for medical attention.

In case of skin contact

Rinse and then wash skin with water and soap.

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. Refer for medical attention .

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

Exposure Routes: inhalation, ingestion Symptoms: Parkinson's; asthenia,

insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage Target Organs: respiratory system, central nervous system, blood, kidneys (NIOSH, 2016)

#### 4.3 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. /Manganese and related compounds/

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### 5. Fire-fighting measures

#### 5.1 Extinguishing media

Suitable extinguishing media

Use dry chemical to extinguish.

#### 5.2 Specific hazards arising from the chemical

Excerpt from ERG Guide 170 [Metals (Powders, Dusts, Shavings, Borings, Turnings, or Cuttings, etc.)]: May react violently or explosively on contact with water. Some are transported in flammable liquids. May be ignited by friction, heat, sparks or flames. Some of these materials will burn with intense heat. Dusts or fumes may form explosive mixtures in air. Containers may explode when heated. May re-ignite after fire is extinguished. (ERG, 2016)

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

Wear self-contained breathing apparatus for firefighting if necessary.

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### 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

Personal protection: P2 filter respirator for harmful particles. Sweep spilled substance into covered containers. Carefully collect remainder. Then store and dispose of according to local regulations.

## 6.3 Methods and materials for containment and cleaning up

Evacuate and restrict persons not wearing protective equipment from area of spill or leak until cleanup is complete. Remove all ignition sources. Collect powdered material in the most convenient and safe manner and deposit in sealed containers. Ventilate area after cleanup is complete. It may be necessary to contain and dispose of this chemical as a hazardous waste. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Contact your Department of Environmental Protection or your regional office of the federal EPA for specific recommendations. If employees are required to clean up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

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## 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

Separated from acids. Dry. Prior to working with this chemical you should be trained on its proper handling and storage. Manganese must be stored to avoid contact with water and steam since flammable hydrogen gas is produced. Store in tightly closed containers in a cool, well ventilated area away from oxidizers (such as perchlorates, peroxides, permanganates, chlorates, and nitrates). Protect storage against physical damage.

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## 8. Exposure controls/personal protection

### 8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 1 mg/cu m.  
/Manganese compounds and fume (as Mn)/

Recommended Exposure Limit: 15 Min Short-Term Exposure Limit: 3 mg/cu m.  
/Manganese compounds and fume (as Mn)/

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

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## 9. Physical and chemical properties

Physical state	A lustrous, brittle, silvery solid
Colour	Hard grey metal

Odour	no data available
Melting point/ freezing point	1260°C
Boiling point or initial boiling point and boiling range	1962°C(lit.)
Flammability	Metal: Combustible SolidCombustible.
Lower and upper explosion limit / flammability limit	no data available
Flash point	no data available
Auto-ignition temperature	MANGANESE DUST CLOUDS HAVE MINIMAL IGNITION TEMP OF 450 DEG C. ... THE LIMITING OXYGEN (O2) PERCENTAGE PREVENTING IGNITION OF DUST CLOUD IS 15.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Insoluble (NIOSH, 2016)
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	0 mm Hg (approx) (NIOSH, 2016)
Density and/or relative density	7.3g/mL at 25°C(lit.)
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

Superficially oxidized on exposure to air.

### 10.3 Possibility of hazardous reactions

MODERATE, IN FORM OF DUST OR POWDER, WHEN EXPOSED TO FLAME. Dust explosion possible if in powder or granular form, mixed with air. Manganese

dust(finely divided) has been known to be pyrophoric. Powdered manganese ignites in chlorine and burns brilliantly; with fluorine the reaction takes place with incandescence [Mellor 12:185, 344. 1946-47]. Concentrated nitric acid reacts with manganese with incandescence and a feeble explosion [Mellor 12:188. 1946-47]. Manganese or potassium ignites in nitrogen dioxide [Ann. Chim. et Phys.(2) 2:317]. Manganese burns with a brilliant flame when heated in sulfur dioxide vapor [Mellor 12:187. 1946-47]. Contact with conc. hydrogen peroxide causes violent decomposition and/or ignition.

#### 10.4 Conditions to avoid

no data available

#### 10.5 Incompatible materials

Will react with water or steam to produce hydrogen; can react with oxidizing materials.

#### 10.6 Hazardous decomposition products

Decomp cold water slowly, rapidly on heating; converted by fluorine into di- and trifluoride; by chlorine into the dichloride.

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### 11. Toxicological information

Acute toxicity

- Oral: no data available
- 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

### EPA-D

## Reproductive toxicity

Reproductive effects, such as impotence and loss of libido, have been noted in male workers afflicted with manganism attributed to occupational exposure to high levels of manganese by inhalation. No information is available on developmental effects of manganese in humans. Animal studies have reported degenerative changes in the seminiferous tubules leading to sterility from intratracheal instillation of high doses of manganese (experimentally delivering the manganese directly to the trachea). In young animals exposed to manganese orally, decreased testosterone production and retarded growth of the testes were reported. Decreased activity levels and a decrease in average pup weight have been noted in the offspring of mice exposed to manganese by inhalation.

### STOT-single exposure

no data available

### STOT-repeated exposure

no data available

### Aspiration hazard

no data available

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## 12. Ecological information

### 12.1 Toxicity

- Toxicity to fish: no data available
- 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

no data available

### 12.3 Bioaccumulative potential

no data available

## 12.4 Mobility in soil

no data available

## 12.5 Other adverse effects

no data available

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# 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.

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# 14. Transport information

## 14.1 UN Number

ADR/RID: UN3208

IMDG: UN3208

IATA: UN3208

## 14.2 UN Proper Shipping Name

ADR/RID: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.

IMDG: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.

IATA: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S.

## 14.3 Transport hazard class(es)

ADR/RID: 4.3

IMDG: 4.3

IATA: 4.3

## 14.4 Packing group, if applicable

ADR/RID: Not dangerous goods.

IMDG: Not dangerous goods.

IATA: Not dangerous goods.

## 14.5 Environmental hazards

ADR/RID: no

IMDG: no

IATA: no

## 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

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## 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
manganese atom	manganese atom	7439-96-5	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			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.

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## 16. Other information

Information on revision

Creation Date            Aug 16, 2017

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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)
- 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/>

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Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate

safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.