ChemicalBook

Chemical Safety Data Sheet MSDS / SDS

Nitroguanidine

Revision Date:2025-02-01 Revision Number:1

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

Product identifier

Product name	: Nitroguanidine
CBnumber	: CB1853823
CAS	: 556-88-7
EINECS Number	: 209-143-5
Synonyms	: Nitroguanidine,Picrite

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

Explosives, Division 1.1

Label elements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H201 Explosive; mass explosion hazard

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P230 Keep wetted with ...

P234 Keep only in original packaging.

P240 Ground and bond container and receiving equipment.

P250 Do not subject to grinding/shock/friction/….

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

Response

P370+P372+P380+P373 In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.

Storage

P401 Store in accordance with…

Disposal

P503 Refer to manufacturer/supplier… for information on disposal/recovery/recycling.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Nitroguanidine
Synonyms	: Nitroguanidine,Picrite
CAS	: 556-88-7
EC number	: 209-143-5
MF	: CH4N4O2
MW	: 104.07

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

Excerpt from ERG Guide 113 [Flammable Solids - Toxic (Wet/Desensitized Explosive)]: Some are toxic and may be fatal if inhaled, swallowed or absorbed through skin. Contact may cause burns to skin and eyes. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

Excerpt from ERG Guide 112 [Explosives* - Division 1.1, 1.2, 1.3 or 1.5]: Fire may produce irritating, corrosive and/or toxic gases. (ERG, 2016)

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. Dinitrophenol and Related Compounds

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SECTION 5: Firefighting measures

Extinguishing media

If material on fire or involved in fire: Dangerously explosive. Do not fight fires in a cargo of explosives. Evacuate area and let burn. Nitroguanidine, dry

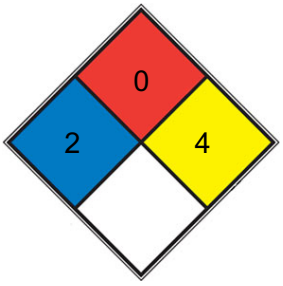
Specific Hazards Arising from the Chemical

Excerpt from ERG Guide 113 [Flammable Solids - Toxic (Wet/Desensitized Explosive)]: Flammable/combustible material. May be ignited by heat, sparks or flames. DRIED OUT material may explode if exposed to heat, flame, friction or shock; treat as an explosive, refer to ERG Guide 112. Keep material wet with water or treat as an explosive, refer to ERG Guide 112. Runoff to sewer may create fire or explosion hazard. (ERG, 2016)
Excerpt from ERG Guide 112 [Explosives* - Division 1.1, 1.2, 1.3 or 1.5]: MAY EXPLODE AND THROW FRAGMENTS 1600 METERS (1 MILE) OR MORE IF FIRE REACHES CARGO. For information on "Compatibility Group" letters, refer to Glossary section. (ERG, 2016)

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

NFPA 704



■	HEALTH	2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. diethyl ether, ammonium phosphate, iodine)
■	FIRE	0	Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 820 °C (1,500 °F) for a period of 5 minutes.(e.g. Carbon tetrachloride)
■	REACT	4	Readily capable of detonation or explosive decomposition at normal temperatures and pressures (e.g. nitroglycerin,chlorine dioxide, nitrogen triiodide)
□	SPEC. HAZ.		

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

Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

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

Keep container tightly closed in a dry and well-ventilated place. Store in cool place. Keep in a dry place. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Solid. Crystalline.
Colour	Colorless.
Odour	no data available
Melting point/freezing point	Remarks:Source: Kenyon 1982.
Boiling point or initial boiling point and boiling range	323.3°C at 760 mmHg
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	149.3°C
Auto-ignition temperature	Ca. 216 °C.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Slightly soluble in ethanol; insoluble in ethyl ether; very soluble in alkali
Partition coefficient n-octanol/water	log Pow = Ca. -0.815. Temperature:20 °C.
Vapour pressure	0 Pa. Temperature:20 °C. Remarks:Result is derived using the Clausius-Clapeyron equation.
Density and/or relative density	1.76 g/cm3. Temperature:20 °C.;1.76. Temperature:20 °C.
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

No rapid reaction with air. No rapid reaction with water.

Chemical stability

Alpha is the usual stable form...

Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat, flame, or by chemical reaction with oxidizers.Nitroalkanes, such as NITROGUANIDINE, range from slight to strong oxidizing agents. If mixed with reducing agents, including hydrides, sulfides and nitrides, they may begin a vigorous reaction that culminates in a detonation. Nitroalkanes are milder oxidizing agents, but still react violently with reducing agents at higher temperature and pressures. Nitroalkanes react with inorganic bases to form explosive salts. The presence of metal oxides increases the thermal sensitivity of nitroalkanes. Nitroalkanes with more than one nitro group are generally explosive. Nitroalkanes are insoluble in water. Flammable/combustible material. May be ignited by heat, sparks or flames. DRIED OUT material may explode if exposed to heat, flame, friction or shock; Treat as an explosive. Mercury and silver complex salts of nitroguanidine are very impact sensitive.

Conditions to avoid

no data available

Incompatible materials

Can react vigorously with oxidizing materials and the derivatives can be explosive.

Hazardous decomposition products

Decomposes immediately on melting to form ammonia, water vapor, and solid products. The gases from the decomposition of nitroguanidine are far less erplosive than gases from other similar explosives.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 10,200 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

CLASSIFICATION: D; not classifiable as to human carcinogenicity. BASIS FOR CLASSIFICATION: Pertinent data regarding carcinogenicity have not been located in the available literature. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: None. Based on former classification system

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 - Poecilia reticulata - > 1 600 mg/L - 96 h. Remarks:80% active ingredient.
Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - > 3 000 mg/L - 48 h. Remarks:80% active ingredient, 20% water.
Toxicity to algae: EC50 - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - ca. 2 000 mg/L - 5 d.
Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - > 300 mg/L - 3 h. Remarks:Respiration rate.

Persistence and degradability

AEROBIC: 1-Nitroguanidine is not susceptible to aerobic biodegradation in activated sludge, and was stable under sterile reducing conditions(1,2). No decomposition occurred under aerobic conditions in either batch or continuous cultures(2). After acclimation, nitroguanidine co-metabolizes to form nitrosoguanidine(2). 1-Nitroguanidine, present at 100 mg/L, reached less than 14% of its theoretical BOD after 4 weeks in an activated sludge inoculum at 30 mg/L in the Japanese MITI test(3).

Bioaccumulative potential

An estimated BCF of 3.2 was calculated in fish for 1-nitroguanidine(SRC), using a log Kow of -0.89(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 1-nitroguanidine is estimated as 21(SRC), using a log Kow of -0.89(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that 1-nitroguanidine is expected to have very high mobility in soil. A sorption partition coefficient of <0.1 was calculated using sediments characterized by high surface areas(4).

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: UN1336 (For reference only, please check.)

IMDG: UN1336 (For reference only, please check.)

IATA: UN1336 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: NITROGUANIDINE (PICRITE), WETTED with not less than 20% water, by mass (For reference only, please check.)

IMDG: NITROGUANIDINE (PICRITE), WETTED with not less than 20% water, by mass (For reference only, please check.)

IATA: NITROGUANIDINE (PICRITE), WETTED with not less than 20% water, by mass (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.)

IMDG: 4.1 (For reference only, please check.)

IATA: 4.1 (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: No

IMDG: No

IATA: No

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

Not 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/

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