Chemical Safety Data Sheet MSDS / SDS

Dinitrogen oxide SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Dinitrogen oxide

CAS: 10024-97-2

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.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Specific target organ toxicity - single exposure, Category 3

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H270 May cause or intensify fire; oxidizer
H280 Contains gas under pressure; may explode if heated
H336 May cause drowsiness or dizziness

Precautionary statement(s)

Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P319 Get medical help if you feel unwell.

Storage

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

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Dinitrogen oxide
Common names and synonyms:	Dinitrogen oxide
CAS number:	10024-97-2
EC number:	233-032-0
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

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

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/effects, acute and delayed

Inhalation causes intense analgesia; concentrations of over 40-60% cause loss of consciousness preceded by hysteria. Contact of liquid with eyes or skin causes frostbite burn. (USCG, 1999)
Excerpt from ERG Guide 122 [Gases - Oxidizing (Including Refrigerated Liquids)]: Vapors may cause dizziness or asphyxiation without warning. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. Fire may produce irritating and/or toxic gases. (ERG, 2016)

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 if

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. Nitrogen Oxides (NOx) and Related Compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical

Behavior in Fire: Will support combustion, and may increase intensity of fire. Containers may explode when heated. (USCG, 1999) Excerpt from ERG Guide 122 [Gases - Oxidizing (Including Refrigerated Liquids)]: Substance does not burn but will support combustion. Some may react explosively with fuels. May ignite combustibles (wood, paper, oil, clothing, etc.). Vapors from liquefied gas are initially heavier than air and spread along ground. Runoff may create fire or explosion hazard. Containers may explode when heated. Ruptured cylinders may rocket. (ERG, 2016)

Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. If liquid: do NOT absorb in saw-dust or other combustible components.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. If liquid: do NOT absorb in saw-dust or other combustible components.

Methods and materials for containment and cleaning up

ACCIDENTAL RELEASE MEASURES: Personal precautions, protective equipment and emergency procedures: Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas; Environmental precautions: Prevent further leakage or

spillage if safe to do so. Do not let product enter drains; Methods and materials for containment and cleaning up: 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.

SECTION 7: Handling and storage

Precautions for safe handling

NO contact with combustible substances. Closed system, ventilation, explosion-proof electrical equipment and lighting. 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

Fireproof if in building. Separated from reducing agents and combustible substances. Cool.Keep container tightly closed in a dry and well-ventilated place. Contents under pressure.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 50 ppm as TWA; A4 (not classifiable as a human carcinogen).MAK: 180 mg/m3, 100 ppm; peak limitation category: II(2); pregnancy risk group: C

Biological limit values

no data available

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.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

Skin protection

Cold-insulating gloves.

Respiratory protection

Use ventilation. Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Nitrous oxide is a colorless, sweet-tasting gas. It is also known as "laughing gas". Continued breathing of the vapors may impair the decision making process. It is noncombustible but it will accelerate the burning of combustible material in a fire. It is soluble in water. Its vapors are heavier than air. Exposure of the container to prolonged heat or fire can cause it to rupture violently and rocket. It is used as an anesthetic, in pressure packaging, and to manufacture other chemicals.
Colour:	Colorless gas [Note: Shipped as a liquified compressed gas]
Odour:	Slightly sweetish
Melting point/freezing point:	-91°C(lit.)
Boiling point or initial boiling point and boiling range:	?88°C(lit.)
Flammability:	Nonflammable Gas, but supports combustion at elevated temperatures.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	no data available
Auto-ignition temperature:	no data available

Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	0.0145 cP at 25 deg C at 101.325 KPa (gas)
Solubility:	0.1 % at 77° F (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	51.7 mm Hg (21 °C)
Density and/or relative density:	1.46 g/cm3
Relative vapour density:	1.53 (15 °C, vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

The substance is a strong oxidant above 300°C. It reacts violently with reducing agents and some combustible substances. This generates fire and explosion hazard.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Spontaneous ignition occurs when nitrous oxide and lithium hydride or hydrazine are mixed. The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. NITROUS OXIDE is a weak oxidizing agent. Nonflammable but supports combustion. Can explode at high temperature (after vaporization). Vapors can undergo a violent reaction with aluminum, boron, hydrazine, lithium hydride, phenyllithium, phosphine, sodium, tungsten carbide [Bretherick, 5th ed., 1995, p. 1686]. Contact of the cold liquefied gas with water may result in vigorous or violent boiling. If the water is hot, a liquid "superheat" explosion may occur. Pressures may build to dangerous levels if liquefied gas contacts water in a closed container [Handling Chemicals Safely

1980].

Conditions to avoid

no data available

Incompatible materials

Incompatible materials: Aluminum, Borane/boron oxides, Hydrazine, Strong reducing agents

Hazardous decomposition products

This compound decomposes explosively at high temperatures.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Rat inhalation 160 mg/cu m/6 hr

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

A4; Not classifiable as a human carcinogen.

Reproductive toxicity

no data available

STOT-single exposure

The liquid may cause frostbite. The substance may cause effects on the central nervous system. This may result in lowering of consciousness.

STOT-repeated exposure

The substance may have effects on the bone marrow and nervous system. May cause reproductive toxicity in humans.

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

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

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

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: UN2201 (For reference only, please check.)
IMDG: UN2201 (For reference only, please check.)
IATA: UN2201 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: NITROUS OXIDE, REFRIGERATED LIQUID (For reference only, please check.)
IMDG: NITROUS OXIDE, REFRIGERATED LIQUID (For reference only, please check.)
IATA: NITROUS OXIDE, REFRIGERATED LIQUID (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.2 (For reference only, please check.)

IMDG: 2.2 (For reference only, please check.)
IATA: 2.2 (For reference only, please check.)

Packing group, if applicable

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

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/

Other Information

Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.Other UN number: 2201 Nitrous oxide, refrigerated liquid.