

Chemical Safety Data Sheet MSDS / SDS

Nitromethane

Revision Date:2023-12-02 Revision Number:1

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

Product identifier

Product name : Nitromethane
CBnumber : CB2753821
CAS : 75-52-5
EINECS Number : 200-876-6
Synonyms : nitromethane, CH₃NO₂

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

Flammable liquids, Category 3
Acute toxicity - Category 4, Oral

Label elements**Pictogram(s)**

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Signal word : Danger

Hazard statement(s)

H226 Flammable liquid and vapour
H302 Harmful if swallowed
H331 Toxic if inhaled
H351 Suspected of causing cancer

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

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

P370+P378 In case of fire: Use ... for extinction.

P370+P380+P375 in case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

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

Prevention

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

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

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

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].

P370+P378 In case of fire: Use ... to extinguish.

P301+P317 IF SWALLOWED: Get medical help.

P330 Rinse mouth.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.

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

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Nitromethane
Synonyms	: nitromethane, CH ₃ NO ₂
CAS	: 75-52-5
EC number	: 200-876-6
MF	: CH ₃ NO ₂
MW	: 61.04

SECTION 4: First aid measures

Description of first aid measures

If inhaled

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

Following skin contact

Rinse skin with plenty of water or shower.

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

Refer for medical attention .

Most important symptoms and effects, both acute and delayed

Liquid may dry out skin and cause irritation. (USCG, 1999)

Indication of any immediate medical attention and special treatment needed

Flush eyes copiously. Wash contaminated areas of body with soap and water.

SECTION 5: Firefighting measures

Extinguishing media

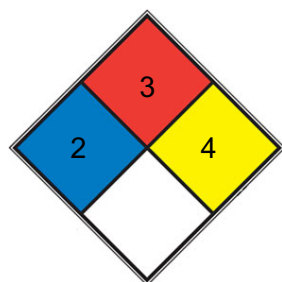
Fire Fighting Procedures: Explosive decomposition may occur under fire conditions. Fight fires from protected location or maximum possible distance. Use water spray, dry chemical, foam, or carbon dioxide. Use water spray to keep fire-exposed containers cool.

Specific Hazards Arising from the Chemical

Behavior in Fire: Containers may explode (USCG, 1999)

Advice for firefighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

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 3 Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions . Liquids having a flash point below 22.8 °C (73 °F) and having a boiling point at or above 37.8 °C (100 °F) or having a flash point between 22.8 and 37.8 °C (73 and 100 °F). (e.g. gasoline, [acetone](#))

REACT 4 Readily capable of detonation or explosive decomposition at normal temperatures and pressures (e.g. [nitroglycerin](#), chlorine dioxide, nitrogen triiodide)

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SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Remove all ignition sources. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

Methods and materials for containment and cleaning up

Remove all ignition sources. establish forced ventilation to keep levels below explosive limit. Absorb liquids in vermiculite, dry sand, earth, peat, carbon, or a similar material and deposit in sealed containers. Follow by washing surfaces well first with alcohol, then with soap and water.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 35°C use a closed system, ventilation and explosion-proof electrical equipment. Do NOT expose to friction or shock. 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. Separated from incompatible materials. See Chemical Dangers. See Notes. Storage Recommendations: Store in a cool, dry, well-ventilated location. Separate from amines, acids, bases, oxidizing materials, and metal oxides. Outside or detached storage is preferred.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 20 ppm as TWA; A3 (confirmed animal carcinogen with unknown relevance to humans). MAK: skin absorption (H); carcinogen category: 3B

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 safety goggles.

Skin protection

Protective gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Liquid
Colour	APHA: ≤ 10
Odour	Moderately strong, somewhat disagreeable odor
Melting point/freezing point	-29°C
Boiling point or initial boiling point and boiling range	101.2°C(lit.)
Flammability	Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.
Lower and upper explosion limit/flammability limit	7.3-63.0%(V)
Flash point	36°C
Auto-ignition temperature	784°F
Decomposition temperature	no data available
pH	6.4 (0.6g/l, H ₂ O, 20°C)
Kinematic viscosity	0.614 cP at 25 deg C
Solubility	105g/l
Partition coefficient n-octanol/water	low Kow = -0.35
Vapour pressure	27.3 mm Hg (20 °C)
Density and/or relative density	1.127g/mL at 25°C(lit.)
Relative vapour density	2.1 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

May decompose explosively on shock, friction or concussion. May explode on heating. Decomposes on burning. This produces nitrogen oxides. Reacts with alkalis. Reacts violently with strong oxidants and strong reducing agents. This generates fire and explosion hazard. Mixtures with amines are shock-sensitive.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

A very dangerous fire hazard when exposed to heat, oxidizers or flame. The vapour is heavier than air and may travel along the ground; distant ignition possible. NITROMETHANE may explode if heated or strongly shocked, especially if mixed with acids, bases [Handling Chemicals Safely 1980. p. 687], acetone, aluminum powder, ammonium salts in the presence of organic solvents, haloforms (chloroform, bromoform), or hydrazine in methanol. Ignites on contact with alkyl aluminum or alkyl zinc halides. Reacts violently with strong bases (potassium hydroxide, calcium hydroxide), amines (1,2-diaminoethane, hydrazine), bromine, carbon disulfide, hydrocarbons, formaldehyde, metal oxides, lithium aluminum hydride, sodium hydride, strong oxidizing agents (lithium perchlorate, nitric acid, calcium hypochlorite). Reacts with aqueous silver nitrate to form explosive silver fulminate [Bretherick, 5th ed., 1995, p. 183]. Mixtures of nitromethane and aluminum chloride may explode when organic matter is present [Chem. Eng. News 26:2257. 1948]. Nitromethane, either alone or in a mixture with methanol and castor oil, has a delayed but violent reaction with powdered calcium hypochlorite [Haz. Home Chem 1963]. Nitromethane reacts violently with hexamethylbenzene [Lewis 2544]. Nitromethane is strongly sensitized by hydrazine [Forshey, D. RR. et al, Explosivestoffe, 1969, 17(6), 125-129].

Conditions to avoid

no data available

Incompatible materials

Amines; strong acids, alkalis and oxidizers; hydrocarbons and other combustible materials; metallic oxides [Note: Slowly corrodes steel and copper when wet.]

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /nitrogen oxides/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 940 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

A3; Confirmed animal carcinogen with unknown relevance to humans.

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system. This may result in central nervous system depression.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the peripheral nervous system, kidneys and liver. This may result in impaired functions.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50; Species: *Pimephales promelas* (Fathead minnow); Conditions: static; Concentration: <278 mg/L for 96 hr

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

AEROBIC: When nitromethane was incubated with activated sludge, 36.2% mineralization occurred in 5 days(1,2). Degradation was low in a closed bottle biodegradability test, using a municipal sewage plant effluent inoculum, with 10% degradation occurring in 28 days(1,2).

Aerobic C14 studies performed with soil microorganisms resulted in 5.1% conversion to CO₂ in 35 days(1,2); during this time, 22.3% was lost as volatile products(1,2). Nitromethane present at 500 mg/L and inoculated with activated sludge from three municipal treatment plants was toxic to the microorganisms present over the 24 hour study period(3).

Bioaccumulative potential

A BCF value of 1.4 was measured for fish (*Golden ide* (*Leuciscus idus melanotus*)) in a static 3-day test with nitromethane present at 50 ppb(1,2). According to a classification scheme(3), this BCF value suggests that bioconcentration in aquatic organisms is low(SRC). Low bioconcentration was reported for tests using carp (*Cyprinus carpio*)(4), however actual BCF values were not reported(SRC). The bioconcentration factor in algae (*Chorella fusca*), as determined in a 24-hr experiment, was 960(1).

Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of nitromethane can be estimated to be 10(SRC). According to a classification scheme(2), this estimated Koc value suggests that nitromethane is expected to have very high mobility in soil.

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: UN1261 (For reference only, please check.)

IMDG: UN1261 (For reference only, please check.)

IATA: UN1261 (For reference only, please check.)

UN Proper Shipping Name

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

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

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

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)

IMDG: 3 (For reference only, please check.)

IATA: 3 (For reference only, please check.)

Packing group, if applicable

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

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

IATA: II (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

Will turn shock-sensitive if contaminated with acids, bases, metal oxides, hydrocarbons and other combustible materials. Combustion in a confined space may turn into detonation. The odour warning when the exposure limit value is exceeded is insufficient.

Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.