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

1.1 Product identifiers

<table>
<thead>
<tr>
<th>Product name</th>
<th>Nitromethane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Number</td>
<td>02484</td>
</tr>
<tr>
<td>Brand</td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td>Index-No.</td>
<td>609-036-00-7</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>75-52-5</td>
</tr>
</tbody>
</table>

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone

Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

- Flammable liquids (Category 3), H226
- Acute toxicity, Oral (Category 4), H302
- Acute toxicity, Inhalation (Category 4), H332
- Carcinogenicity (Category 2), H351
- Reproductive toxicity (Category 2), H361

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram:

[Flame, Skull and Crossbones, Exclamation Mark]
Signal Word  Warning

Hazard statement(s)
H226  Flammable liquid and vapor.
H302 + H332  Harmful if swallowed or if inhaled.
H351  Suspected of causing cancer.
H361  Suspected of damaging fertility or the unborn child.

Precautionary statement(s)
P201  Obtain special instructions before use.
P202  Do not handle until all safety precautions have been read and understood.
P210  Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233  Keep container tightly closed.
P240  Ground/bond container and receiving equipment.
P241  Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242  Use only non-sparking tools.
P243  Take precautionary measures against static discharge.
P261  Avoid breathing mist or vapors.
P264  Wash skin thoroughly after handling.
P270  Do not eat, drink or smoke when using this product.
P271  Use only outdoors or in a well-ventilated area.
P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330  IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P303 + P361 + P353  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312  IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313  IF exposed or concerned: Get medical advice/ attention.
P370 + P378  In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P235  Store in a well-ventilated place. Keep cool.
P405  Store locked up.
P501  Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Formula</th>
<th>CH3NO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular weight</td>
<td>61.04 g/mol</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>75-52-5</td>
</tr>
<tr>
<td>EC-No.</td>
<td>200-876-6</td>
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<td>Index-No.</td>
<td>609-036-00-7</td>
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</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
</table>

Sigma-Aldrich - 02484
SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Nitrogen oxides (NOx)
Avoid shock and friction.
In the event of decomposition: danger of explosion!
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 **Advice for firefighters**  
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 **Further information**  
Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

---

**SECTION 6: Accidental release measures**

6.1 **Personal precautions, protective equipment and emergency procedures**  
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 **Environmental precautions**  
Do not let product enter drains. Risk of explosion.

6.3 **Methods and materials for containment and cleaning up**  
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 **Reference to other sections**  
For disposal see section 13.

---

**SECTION 7: Handling and storage**

7.1 **Precautions for safe handling**  
**Advice on safe handling**  
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

**Advice on protection against fire and explosion**  
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

**Hygiene measures**  
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 **Conditions for safe storage, including any incompatibilities**  
Store under inert gas.

**Storage class**  
Storage class (TRGS 510): 4.1A: Other explosive hazardous materials

7.3 **Specific end use(s)**  
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.
**SECTION 8: Exposure controls/personal protection**

**8.1 Control parameters**

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>nitromethane</td>
</tr>
<tr>
<td>Remarks</td>
</tr>
<tr>
<td>TWA</td>
</tr>
<tr>
<td>PEL</td>
</tr>
</tbody>
</table>

**8.2 Exposure controls**

**Appropriate engineering controls**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

**Personal protective equipment**

- **Eye/face protection**
  Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

- **Skin protection**
  This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
  - Splash contact
  - Material: Viton®
  - Minimum layer thickness: 0.7 mm
  - Break through time: 120 min
  - Material tested: Vitoject® (KCL 890 / Aldrich Z677698, Size M)

- **Body Protection**
  Flame retardant antistatic protective clothing.

- **Respiratory protection**
  Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds
  - The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.
  - These measures have to be properly documented.
  - The chemical protection for respiratory protection are based on the following standards: DIN EN 143, DIN 14387
and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains. Risk of explosion.

---

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Form: liquid</td>
</tr>
<tr>
<td></td>
<td>Color: clear, colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point/range: -29 °C (-20 °F) - lit.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>101.2 °C 214.2 °F - lit.</td>
</tr>
<tr>
<td>Flash point</td>
<td>35 °C (95 °F) - closed cup - ISO 1523</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Upper explosion limit: 63.0 %(V)</td>
</tr>
<tr>
<td></td>
<td>Lower explosion limit: 7.3 %(V)</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>2.11 - (Air = 1.0)</td>
</tr>
<tr>
<td>Density</td>
<td>1.127 g/mL at 25 °C (77 °F) - lit.</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>104.5 g/l at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>log Pow: -0.24 at 21.8 °C (71.2 °F) - Bioaccumulation is not expected.</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>418 °C (784 °F) at 1,013.25 hPa</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>none</td>
</tr>
</tbody>
</table>

#### 9.2 Other safety information

- **Surface tension**: 73.6 mN/m at 1g/l at 21 °C (70 °F) - OECD Test Guideline 115
SECTION 10: Stability and reactivity

10.1 Reactivity
highly reactive
highly reactive
Vapor/air-mixtures are explosive at intense warming.
Vapor/air-mixtures are explosive at intense warming.

10.2 Chemical stability
heat-sensitive
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Exothermic reaction with:
Hydrocarbons
perchlorates
Risk of explosion with:
acids
anilines
strong alkalis
phosphoric acid
Nitric acid
metallic oxides
organic halides
silver salt
aluminium chloride
alkali hydroxides
Ammonia
iodides
Halogenated hydrocarbon
Chloroform
oxyhalogenic compounds
Organic Substances
Oxidizing agents
Acetone
powdered aluminium
formic acid
ammonium hydroxide
Bases
calcium hypochlorite
Sodium hydroxide
lithium aluminium hydride
sodium carbonate
hydrides
nitrous acid
conc. sulfuric acid
Potassium hydroxide
Calcium hydroxide
Morpholine
Bromoform
Hydrazine hydrate
with
Methanol
formaldehyde
with
Air
Amines
with
Heavy metals
with
alkali hydroxides
Formation of explosive salts possible.

10.4 Conditions to avoid
Elevated temperatures.
Heating.

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 1,478 mg/kg
Remarks: (ECHA)
Symptoms: Nausea, Vomiting, Diarrhea
LC50 Inhalation - Rabbit - 4 h - 14.34 mg/l - vapor

Remarks: (ECHA)
Symptoms: Irritation symptoms in the respiratory tract.
LD50 Dermal - Rabbit - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

 Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
Remarks: (ECHA)

Respiratory or skin sensitization
Intracutaneous test - Guinea pig
Result: negative
Remarks: (ECHA)
**Germ cell mutagenicity**
Test Type: Ames test  
Test system: Salmonella typhimurium  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: negative  
Test Type: Mutagenicity (mammal cell test): chromosome aberration.  
Test system: Chinese hamster ovary cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative

Test Type: Micronucleus test  
Species: Mouse  
Cell type: Bone marrow  
Application Route: inhalation (vapor)  
Method: OECD Test Guideline 474  
Result: negative

**Carcinogenicity**
Suspected of causing cancer.  
IARC: 2B - Group 2B: Possibly carcinogenic to humans (nitromethane)  
NTP: RAHC - Reasonably anticipated to be a human carcinogen (nitromethane)  
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
Suspected of damaging the unborn child.

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

### 11.2 Additional Information
Repeated dose toxicity - Rat - male and female - Oral - 28 Days - LOAEL (Lowest observed adverse effect level) - 100 mg/kg  
Remarks: (ECHA)

RTECS: PA9800000  
Absorption into the body leads to the formation of methemoglobin which in sufficient concentration causes cyanosis. Onset may be delayed 2 to 4 hours or longer.  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:

Methaemoglobinemia

Absorption may result in damage of the following:
Liver
Kidney

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish
static test LC50 - Pimephales promelas (fathead minnow) - > 659.2 mg/l - 96 h 
(APHA 231)

Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia magna (Water flea) - > 103 mg/l - 48 h 
(OECD Test Guideline 202)

Toxicity to algae
static test ErC50 - Pseudokirchneriella subcapitata (green algae) - > 102 mg/l - 72 h 
(OECD Test Guideline 201)

Toxicity to bacteria
static test EC50 - activated sludge - 310 mg/l - 30 min 
(OECD Test Guideline 209)
Remarks: The value is given in analogy to the following substances: 1-nitropropane

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 28 d
Result: 9.9 % - Not readily biodegradable. 
(OECD Test Guideline 301D)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
Discharge into the environment must be avoided.
SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 1261   Class: 3   Packing group: II
Proper shipping name: Nitromethane
Reportable Quantity (RQ):
  Poison Inhalation Hazard: No

IMDG
UN number: 1261   Class: 3   Packing group: II   EMS-No: F-E, S-D
Proper shipping name: NITROMETHANE

IATA
UN number: 1261   Class: 3   Packing group: II
Proper shipping name: Nitromethane
IATA Passenger: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitromethane</td>
<td>75-52-5</td>
<td>2013-02-08</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitromethane</td>
<td>75-52-5</td>
<td>2013-02-08</td>
</tr>
</tbody>
</table>

Pennsylvania Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>nitromethane</td>
<td>75-52-5</td>
<td>2013-02-08</td>
</tr>
</tbody>
</table>
California Prop. 65 Components
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.nitromethane

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>75-52-5</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

SECTION 16: Other information

Further information
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. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.10 Revision Date: 08/27/2023 Print Date: 10/06/2023