SAFETY DATA SHEET

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

1.1 Product identifiers

Product name: Nitric oxide

Product Number: 295566
Brand: Aldrich
CAS-No.: 10102-43-9

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)

Oxidizing gases (Category 1), H270
Gases under pressure (Compressed gas), H280
Acute toxicity, Inhalation (Category 1), H330
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318

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

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger
Hazard statement(s)
H270  May cause or intensify fire; oxidizer.
H280  Contains gas under pressure; may explode if heated.
H314  Causes severe skin burns and eye damage.
H318  Causes serious eye damage.
H330  Fatal if inhaled.

Precautionary statement(s)
P220  Keep/Store away from clothing/ combustible materials.
P244  Keep reduction valves free from oil and grease.
P260  Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264  Wash skin thoroughly after handling.
P271  Use only outdoors or in a well-ventilated area.
P280  Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284  Wear respiratory protection.
P301 + P330 + P331  IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353  IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310  IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338 + P310  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P363  Wash contaminated clothing before reuse.
P370 + P376  In case of fire: Stop leak if safe to do so.
P403 + P233  Store in a well-ventilated place. Keep container tightly closed.
P405  Store locked up.
P410 + P403  Protect from sunlight. Store in a well-ventilated place.
P501  Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
Corrosive to the respiratory tract.

SECTION 3: Composition/information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Nitrogen monoxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula</td>
<td>NO</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>30.01 g/mol</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>10102-43-9</td>
</tr>
<tr>
<td>EC-No.</td>
<td>233-271-0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric oxide</td>
<td>Ox. Gas 1; Press. Gas Compr. Gas; Acute Tox. 1; Skin Corr. 1B; Eye Dam. 1; H270, H280, H330, H314, H318</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Consult a physician. Show this material safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. 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
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Nitrogen oxides (NOx)

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.
6.2 **Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 **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 (see section 13).

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

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**SECTION 7: Handling and storage**

7.1 **Precautions for safe handling**

**Advice on safe handling**
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

**Advice on protection against fire and explosion**
Keep away from sources of ignition - No smoking.

**Hygiene measures**
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
For precautions see section 2.2.

7.2 **Conditions for safe storage, including any incompatibilities**

**Storage conditions**
Keep container tightly closed in a dry and well-ventilated place.
Contents under pressure. Air and moisture sensitive.

**Storage class**
Storage class (TRGS 510): 2A: Gases

7.3 **Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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**SECTION 8: Exposure controls/personal protection**

8.1 **Control parameters**

**Ingredients with workplace control parameters**
### Component CAS-No. Value Control parameters Basis
---
Nitric oxide 10102-43-9 TWA 25 ppm USA. ACGIH Threshold Limit Values (TLV)

TWA 25 ppm 30 mg/m³ USA. NIOSH Recommended Exposure Limits

TWA 25 ppm 30 mg/m³ USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

TWA 25 ppm 30 mg/m³ USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

PEL 25 ppm 30 mg/m³ California permissible exposure limits for chemical contaminants (Title 8, Article 107)

### 8.2 Exposure controls

**Appropriate engineering controls**  
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**Personal protective equipment**

**Eye/face protection**  
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**  
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.

- Full contact  
  Material: butyl-rubber  
  Minimum layer thickness: 0.3 mm  
  Break through time: 480 min  
  Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

- Splash contact  
  Material: Chloroprene  
  Minimum layer thickness: 0.6 mm  
  Break through time: 30 min  
  Material tested: Camapren® (KCL 722 / Aldrich Z677493, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374  
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.
Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties
9.1 Information on basic physical and chemical properties

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
</table>
| a) Appearance | Form: Compressed gas  
|             | Color: brown  |
| b) Odor | No data available |
| c) Odor Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: -163.6 °C (-262.5 °F) - lit. |
| f) Initial boiling point and boiling range | -151.7 °C -241.1 °F - lit. |
| g) Flash point | () No data available |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapor pressure | No data available |
| l) Vapor density | 1.04 - (Air = 1.0) |
| m) Density | No data available  
|             | Relative density | No data available |
| n) Water solubility | 0.067 g/l |
| o) Partition coefficient: n-octanol/water | No data available |
| p) Autoignition temperature | No data available |
| q) Decomposition temperature | No data available |
| r) Viscosity | No data available |
9.2 Other safety information

Relative vapor density 1.04 - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxygen, Halides, Organic materials, Reducing agents, Oxidizing agents, Alcohols

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
Oral: No data available
LC50 Inhalation - Rat - 4 h - 57 ppm
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Causes serious eye damage.

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
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
No data available

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

RTECS: QX0525000
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Nausea, Vomiting, Weakness, Dizziness, Vertigo, Headache, Sweating, loss of appetite
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

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

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 1660   Class: 2.3 (5.1, 8)
Proper shipping name: Nitric oxide, compressed
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: Hazard Zone A

IMDG
UN number: 1660   Class: 2.3 (5.1, 8)
Proper shipping name: Nitric oxide, compressed
EMS-No: F-C, S-W

IATA
UN number: 1660   Class: 2.3 (5.1, 8)
Proper shipping name: NITRIC OXIDE, COMPRESSED
IATA Passenger: Not permitted for transport
IATA Cargo: Not permitted for transport

SECTION 15: Regulatory information

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:
Nitric oxide   CAS-No. 10102-43-9   Revision Date 2013-02-08

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Sudden Release of Pressure Hazard, Reactivity Hazard, Acute Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components
Nitric oxide   CAS-No. 10102-43-9   Revision Date 2013-02-08
SECTION 16: Other information

Further information
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