



SIGMA-ALDRICH

## Material Safety Data Sheet

Date Printed: 05/01/2008  
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### Section 1 - Product and Company Information

**Product Name** Nitric acid, ACS reagent, 70%  
**Product Number** 438073  
**Brand** Sigma-Aldrich  
**Company** Sigma-Aldrich  
**Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 800-328-5832  
**Fax:** 800-328-5052

**Emergency Phone:** 314-776-6535

### Section 2 - Composition/Information on Ingredient

| Substance Name | CAS #     | SDS 313 | EC no     | Annex Index Number |
|----------------|-----------|---------|-----------|--------------------|
| NITRIC ACID    | 7697-37-2 | Yes     | 231-714-2 | 007-004-00-1       |

**Formula** HNO<sub>3</sub>  
**Synonyms** Acide nitrique (French), Acido nitrico (Italian), Aqua fortis, Azotowy kwas (Polish), Hydrogen nitrate, Kyselina dusicna (Czech), Nitric acid (ACGIH/OSHA), Salpetersaure (German), Salpeterminoplossingen (Dutch)

### Section 3 - Hazards Identification

#### Emergency Overview

Oxidizing, Corrosive  
Contact with combustible material may cause fire. Toxic if swallowed. Very toxic by inhalation. Causes severe burns.  
Target organ(s): Lungs, Teeth.

#### HMIS Rating

Health: 3\*      Flammability: 0      Reactivity: 3      Special Hazard(s): Oxidizer

#### NFPA Rating

Health: 3      Flammability: 0      Reactivity: 3      Special Hazard(s): Oxidizer

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

#### Oral Exposure

If swallowed: wash out mouth with water provided person is conscious. Call a physician. Do not induce vomiting.

#### Inhalation Exposure

If inhaled: remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

**Dermal Exposure**  
In case of skin contact: flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

**Eye Exposure**  
In case of contact with eyes: flush with copious amounts of water for at least 15 minutes. Assume adequate flushing by separating the eyelids with fingers. Call a physician.

### Section 5 - Fire Fighting Measures

**Conditions of Flammability**  
Vigorously supports combustion.

**Autoignition Temp:** N/A

**Extinguishing Media Suitable**  
Use extinguishing media appropriate to surrounding fire conditions. Quench with large quantities of water. Use water spray to cool fire-exposed containers.

**Firefighting Protective Equipment**  
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.  
**Specific Hazard(s)**  
Contact with other material may cause fire. May accelerate combustion. Emits toxic fumes under fire conditions.  
**Specific Method(s) of Fire Fighting**  
Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.

### Section 6 - Accidental Release Measures

**Procedure to be Followed in Case of Leak or Spill**  
Evacuate area.

**Procedure(s) of Personal Precaution(s)**  
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

**Methods for Cleaning Up**  
Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### Storage

**Suitable**  
Keep tightly closed.

**Unsuitable**  
Do not store near, nor allow contact with, clothing and other combustible material.

### Section 8 - Exposure Controls / PPE

#### Engineering Controls

Safety shower and eye bath. Use only in a chemical fume hood.

#### Personal Protective Equipment

##### Respiratory

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Use supplied-air or SCBA respirators. Europe permits the use of type ABEK filter cartridge respirators (EN 14387).

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(EU) Use supplied-air or SCBA respirators. Europe permits the use of type ABEK fullface cartridge respirators (EN 14387).

**Hand**  
Wear heavy rubber gloves

**Eye**  
Chemical safety goggles

**Other**  
Rubber apron

**General Hygiene Measures**  
Wash thoroughly after handling. Discard contaminated clothing and shoes.

| Exposure Limits        |                 |              |
|------------------------|-----------------|--------------|
| Country                | Type            | Value        |
| Poland                 | NDS             | 5 MG/M3      |
| Poland                 | NDSch           | 10 MG/M3     |
| Poland                 | NDSP            |              |
| Exposure Limits, RTECS |                 |              |
| Country                | Source          | Type         |
| USA                    | ACGIH           | STEL         |
| USA                    | ACGIH           | TWA          |
| USA                    | MSHA            | Standard air |
| USA                    | OSHA            | PEL          |
| New Zealand            | OEL             |              |
| Remarks                | check ACGIH TLV |              |
| USA                    | NIOSH           | TWSTEL       |
|                        |                 | 2 PPM 4 PPM  |

### Section 9 - Physical/Chemical Properties

| Appearance            | Color     |
|-----------------------|-----------|
| Physical State        | Colorless |
| Clear liquid          |           |
| Molecular Weight      |           |
| 6.301 AMU             |           |
| Properties            |           |
| Property              | Value     |
| pH                    | < 1       |
| BP/BP Range           | 100 °C    |
| MP/MP Range           | N/A       |
| Freezing Point        | N/A       |
| Vapor Pressure        | 8 mmHg    |
| Vapor Density         | 1 g/l     |
| Saturated Vapor Conc. | N/A       |
| SG/Density            | 15 g/cm3  |
| Bulk Density          | N/A       |
| Odor Threshold        | N/A       |
| Volatile%             | N/A       |
| VOC Content           | N/A       |
| Water Content         | N/A       |
| Solvent Content       | N/A       |
| Evaporation Rate      | N/A       |
| Viscosity             | N/A       |
| Partition Coefficient | N/A       |
| Decomposition Temp.   | N/A       |
| Flash Point °C        | N/A       |
| Flash Point °F        | N/A       |
| Explosion Limits      |           |
| N/A                   |           |
| Flammability          |           |
| N/A                   |           |
| Autoignition Temp     |           |
| N/A                   |           |

**Solubility**  
N/A

**N/A = not available**

### Section 10 - Stability and Reactivity

| Stability   |
|---|
| Stable  |
| Conditions of Instability   |
| May discolor on exposure to light.  |
| Materials to Avoid  |
| Alkali metals, Organic materials, Acetic anhydride, Acetonitrile, Alcohols, Acrylonitrile, Ammonia, Crotonaldehyde, Chlorinated hydrocarbons, Acids, Bases, Metals, Hexalthium disulfide, Hydrogen peroxide, Ketones, Metal acetylides or carbides, Water, Fluorine, aliphatic amines, alkanethiols, anilines, benzidine, bromine pentafluoride, cadmium phosphide, copper nitride, hydrazine and derivatives, organic nitro compounds, diphenyltin, unsaturated hydrocarbons, nonmetal hydrides, metal cyanides, nitrides, non-metallic elements, phosphine derivatives, nonmetal halides, pyrocalcic, thiophene, uranium disulfide, wood, paper and celluloses (may ignite), divinyl ether, ethanesulfonamide |
| Hazardous Decomposition Products  |
| Nitrogen oxides   |
| Hazardous Polymerization  |
| Will not occur.   |

### Section 11 - Toxicological Information

| Route of Exposure  |
|--|
| Skin Contact   |
| Causes severe burns  |
| Skin Absorption  |
| May be harmful if absorbed through the skin.   |
| Eye Contact  |
| Causes severe burns  |
| Inhalation   |
| Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.  |
| Ingestion  |
| May be harmful if swallowed. Ingestion can cause immediate burning pain in the mouth, throat, abdomen, severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions.   |
| Target Organ(s) or System(s)   |
| Lungs, Teeth, Cardiovascular system.   |
| Signs and Symptoms of Exposure   |
| Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasms, inflammation and edema of the larynx and bronchi, chemical pneumonia, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Large doses may cause conversion of hemoglobin to methemoglobin, producing cyanosis, marked in blood pressure, leading to collapse, coma, and possibly death. Exposure may cause Pulmonary edema. Effects may be delayed to the best of our knowledge. The chemical, physical, and toxicological properties have not been thoroughly investigated. |
| RTECS Number:  |
| QU5775000  |
| Toxicity Data  |
| Oral - Human 430 mg/kg (LDL0)  |
| Chronic Exposure - Teratogen   |
| Species Dose Route of Admin. Effect Exposure Time  |
| Rat 21150 MG/KG Oral (1-21D PREG)  |
| Result: Effects on Embryo or Fetus. Fetotoxicity (except death), e.g., stunted fetus   |

**Chronic Exposure - Reproductive Hazard**  
Species Dose Route of Application Exposure Time  
Rat 2345 MG/KG Oral (180 PREG)  
Result Effects on Newborn: Biochemical and metabolic.

**Section 12 - Ecological Information**

No data available

**Additional Results/Data from Relevant Scientific Experiments**

May be harmful to aquatic organisms due to the shift of the pH.

**Section 13 - Disposal Considerations**

**Appropriate Method of Disposal of Substance or Preparation**

Contact a licensed professional waste disposal service to dispose of this material  
Observe all federal, state, and local environmental regulations.

**Section 14 - Transport Information**

**DOT**

**Proper Shipping Name:** Nitric acid (other than red fuming, with more than 70 percent nitric acid)

**UN#:** 2031

**Class:** 8

**Packing Group:** Packing Group I

**Hazard Label:** Corrosive

**Hazard Label:** Oxidizer

**PIH:** Not PIH

**IATA**

**Proper Shipping Name:** Nitric acid

**IATA UN Number:** 2031

**Hazard Class:** 8

**Packing Group:** I

**Not Allowed - Aircraft:** Cargo aircraft only. Not permitted on passenger aircraft.

**Section 15 - Regulatory Information**

**EU Directives Classification**

**Symbol of Danger:** O C

**Indication of Danger:** Oxidizing, Corrosive

**Risk Statements**

**R:** 8 35

Contact with combustible material may cause fire Causes severe burns.

**Safety Statements**

**S:** 23 26 36 45

Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice/Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**US Classification and Label Text**

**Indication of Danger:** Oxidizing, Corrosive

**Risk Statements**

Contact with combustible material may cause fire Toxic if swallowed. Very toxic by inhalation. Causes severe burns.

**Safety Statements**

Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice/Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**US Statements**

Target organ(s): Lungs, Teeth

**United States Regulatory Information**

**SARA Listed:** Yes

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**Deminimis:** 1 %

**Notes:** This product is subject to SARA section 313 reporting requirements.

**TSCA Inventory Item:** Yes

**Canada Regulatory Information**

**WHMIS Classification**

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**DSL:** Yes

**NDSL:** No

**Section 16 - Other Information**

**Disclaimer**

For R&D use only. Not for drug, household or other uses.

**Warranty**

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. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice packing slip for additional terms and conditions of sale. Copyright©2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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