

Chemical Safety Data Sheet MSDS / SDS

Nitric acid SDS

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

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

Product name: Nitric acid
CAS: 7697-37-2

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
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SECTION 2: Hazards identification**Classification of the substance or mixture**

Oxidizing liquids, Category 2
Skin corrosion, Sub-category 1A

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H272 May intensify fire; oxidizer

H314 Causes severe skin burns and eye damage

Precautionary statement(s)

Prevention

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

P220 Keep away from clothing and other combustible materials.

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

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P264 Wash ... thoroughly after handling.

Response

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

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P363 Wash contaminated clothing before reuse.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P316 Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

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:	Nitric acid
Common names and synonyms:	Nitric acid
CAS number:	7697-37-2
EC number:	231-714-2
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

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

Following skin contact

Wear protective gloves when administering first aid. First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again. Refer immediately for medical attention .

Following eye contact

Rinse with plenty of water for several minutes (remove contact lenses if easily possible). Refer immediately for medical attention.

Following ingestion

Rinse mouth. Give nothing to drink. Do NOT induce vomiting. Refer immediately for medical attention.

Most important symptoms/effects, acute and delayed

Excerpt from ERG Guide 157 [Substances - Toxic and/or Corrosive (Non-Combustible / Water-Sensitive)]: TOXIC; inhalation, ingestion or contact (skin, eyes) with vapors, dusts or substance may cause severe injury, burns or death. Reaction with water or

moist air may release toxic, corrosive or flammable gases. Reaction with water may generate much heat that will increase the concentration of fumes in the air. Fire will produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. (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 as 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. Inorganic acids and related compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

Approach fire from upwind to avoid hazardous vapors & toxic decomposition products. Use flooding quantities of water as spray or fog. Use water spray to keep fire-exposed containers cool. Extinguish fire using agent suitable for surrounding fire.

Specific hazards arising from the chemical

Excerpt from ERG Guide 157 [Substances - Toxic and/or Corrosive (Non-Combustible / Water-Sensitive)]: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. For UN1796, UN1826, UN2031 at high concentrations and for UN2032, these may act as oxidizers, also consult ERG Guide 140. Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.). Substance may react with water (some violently), releasing corrosive and/or toxic gases and runoff. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. (ERG, 2016)

Special protective actions for fire-fighters

Use water in large amounts, carbon dioxide. NO powder, foam. In case of fire: keep drums, etc., cool by spraying with water. NO direct contact of the substance with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT absorb in saw-dust or other combustible absorbents. Ventilation. Collect leaking liquid in sealable containers.

Cautiously neutralize remainder with sodium carbonate. Then wash away with plenty of water.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: chemical protection suit including self-contained breathing apparatus. Do NOT absorb in saw-dust or other combustible absorbents. Ventilation. Collect leaking liquid in sealable containers. Cautiously neutralize remainder with sodium carbonate. Then wash away with plenty of water.

Methods and materials for containment and cleaning up

Spilled nitric acid must not be absorbed with sawdust or other flammable material (because of the fire hazard); instead, its spread must be prevented by the construction of earth barriers.

SECTION 7: Handling and storage

Precautions for safe handling

NO contact with incompatible materials: See Chemical Dangers 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

Separated from combustible substances, reducing agents, bases, organic chemicals and food and feedstuffs. Cool. Dry. Keep in a well-ventilated room. Store only in original container. As a rule, nitric acid is stored in stainless steel tanks and transported in stainless steel containers.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 2 ppm as TWA; 4 ppm as STEL. EU-OEL: 2.6 mg/m³, 1 ppm as STEL

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 face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing. Apron.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Nitric acid, red fuming is a pale yellow to reddish brown liquid generating red-brown fumes and having a suffocating odor. Very toxic by inhalation. Corrosive to metals or tissue. Prolonged exposure to low concentrations or short term exposure to high concentrations may result in adverse health effects. Rate of onset: Immediate Persistence: Hours - days Odor threshold: ~1 ppm Source/use/other hazard: Used in many industries; Very corrosive to skin/mucous membranes as well as metals & other materials.
Colour:	Transparent, colorless, or yellowish, fuming, hygroscopic, corrosive liquid
Odour:	Characteristic choking odor
Melting point/freezing point:	-42°C
Boiling point or initial boiling point and boiling range:	120.5°C(lit.)
Flammability:	Noncombustible Liquid, but increases the flammability of combustible materials.

Lower and upper explosion limit/flammability limit:	Not combustible
Flash point:	120.5 °C
Auto-ignition temperature:	no data available
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	1.092 mPa.s at 0 deg C; 0.746 mPa.s at 25 deg C; 0.617 mPa.s at 40 deg C
Solubility:	Miscible (NIOSH, 2016)
Partition coefficient n-octanol/water:	-0.21
Vapour pressure:	8 mm Hg (20 °C)
Density and/or relative density:	1.400g/cm ³ at 25°C
Relative vapour density:	1 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on warming. This produces toxic and irritating fumes and gases including nitrogen oxides. The substance is a strong oxidant. It reacts violently with combustible and reducing materials, such as turpentine, charcoal and alcohol. The substance is a strong acid. It reacts violently with bases and is corrosive to metals. This produces flammable/explosive gas (hydrogen - see ICSC 0001). Reacts violently with organic compounds.

Chemical stability

no data available

Possibility of hazardous reactions

Contact of concentrated nitric acid with combustible materials may increase the hazard from fire and may lead to an explosion. NITRIC ACID, RED FUMING is a powerful oxidizing agent and nitrating agent. Accelerates the burning of combustible material and may cause charring and then ignition of combustible materials. May ignite alcohols, amines, ammonia, beryllium alkyls, boranes, dicyanogen, hydrazines, hydrocarbons, hydrogen, nitroalkanes, powdered metals, silanes, or thiols on contact [Bretherick 1979. p.174]. Can react violently with finely divided antimony [Pascal 10:504. 1931-34]. Reacts violently with bromine pentafluoride [Mellor 2, Supp. 1:172. 1956]. Reacts with hydrogen selenide and hydrogen sulfide with incandescence [Berichte 3:658]. Mixtures with finely divided magnesium are explosive [Pieters 1957 p. 28]. Oxidizes magnesium phosphide with incandescence [Mellor 8:842. 1946-47]. Mixtures with acetic anhydride containing over 50% nitric acid by mass may act as detonating explosives [BCISC 42:2. 1971]. An etching agent prepared with equal portions of acetone, nitric acid, and 75% aqueous acetic acid exploded four hours after it was prepared and placed in a closed bottle. The explosive material may have been tetranitromethane [Chem. Eng. News 38: 56. 1960]. Reacts violently with phosphine [Edin. Roy. Soc. 13:88. 1835]. Explodes in contact with phosphorus trichloride [Comp. Rend. 28:86]. Reacts exothermically with phthalic acid or phthalic anhydride in the presence of sulfuric acid to give potentially explosive phthaloyl nitrates or nitrites or nitro derivatives of these compounds [Chem. & Ind. 20:790. 1972]. Reacts energetically with sodium azide [Mellor 8, Supp 2:315. 1967]. Reacts with uranium with explosive violence [Katz and Rabinowitch 1951].

Conditions to avoid

no data available

Incompatible materials

Reacts violently with combustible or readily oxidizable materials such as alcohols, turpentine, charcoal, organic refuse. Reacts with most metals to release hydrogen gas.

Hazardous decomposition products

On exposure to atmospheric humidity or heat there is decomposition with the formation of nitrogen peroxide.

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: LC50 Sheep inhalation 0.004 mg/L 4 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

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation may cause asthma-like reactions (RADS). Exposure could cause asphyxiation due to swelling in the throat. Inhalation of high concentrations may cause pneumonitis and lung oedema. See Notes.

STOT-repeated exposure

Repeated or prolonged inhalation may cause effects on the teeth. This may result in tooth erosion. The substance may have effects on the upper respiratory tract and lungs. This may result in chronic inflammation of the respiratory tract and reduced lung function . Mists of this strong inorganic acid are carcinogenic to humans. See Notes.

Aspiration hazard

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

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

Nitric acid ... reduced the amount of carbon mineralized ... in soil amended with 1% glucose ... than did hydrogen sulfate.

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: UN1906 (For reference only, please check.)

IMDG: UN1906 (For reference only, please check.)

IATA: UN1906 (For reference only, please check.)

UN Proper Shipping Name

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

IMDG: SLUDGE ACID (For reference only, please check.)

IATA: SLUDGE ACID (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 8 (For reference only, please check.)

IMDG: 8 (For reference only, please check.)

IATA: 8 (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

The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. IARC considers mists of strong inorganic acid to be carcinogenic (group

1). However there is no information available on the carcinogenicity of other physical forms of this substance. Therefore no classification for carcinogenicity under GHS has been applied. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water. The odour warning when the exposure limit value is exceeded is insufficient. Rinse contaminated clothing with plenty of water because of fire hazard.

Disclaimer: 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. We as supplier shall not be held liable for any