Chemical Safety Data Sheet MSDS / SDS

Perchloric acid SDS

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

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

Product identifier

Product name: Perchloric acid

CAS: 7601-90-3

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

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

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

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H271 May cause fire or explosion; strong 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/...
P283 Wear fire resistant or flame retardant clothing.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.

Response

P306+P360 IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P371+P380+P375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
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

P420 Store separately.
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:	Perchloric acid
Common names and synonyms:	Perchloric acid
CAS number:	7601-90-3
EC number:	231-512-4
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 for medical attention. See Notes.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

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

Rinse mouth. Do NOT induce vomiting. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Inhalation of vapors or mist causes burning sensation of nose and throat, and lung irritation with coughing; prolonged or excessive exposure could cause vomiting and severe coughing. Ingestion causes blistering and burns of mouth and stomach. Contact with eyes or skin causes blistering and burns. (USCG, 1999)
Excerpt from ERG Guide 140 [Oxidizers]: Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

Indication of immediate medical attention and special treatment needed, if necessary

no data available

SECTION 5: Firefighting measures

Suitable extinguishing media

Combat fires from safe distance or protected location. flood discharge area with water. cool exposed containers with water. aqueous soln

Specific hazards arising from the chemical

Behavior in Fire: Above 160°C (320°F) will react with combustible material and increase intensity of fire. Containers may explode. (USCG, 1999)
Excerpt from ERG Guide 140 [Oxidizers]: These substances will accelerate burning when involved in a fire. Some may decompose explosively when heated or involved in a fire. May explode from heat or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard. (ERG, 2016)

Special protective actions for fire-fighters

In case of fire in the surroundings: water in large amounts, water spray. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT absorb in saw-dust or other combustible absorbents. Absorb liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Cautiously neutralize remainder. Do NOT wash away into sewer.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: complete protective clothing including self-contained breathing apparatus. Do NOT absorb in saw-dust or other combustible absorbents. Absorb liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Cautiously neutralize remainder. Do NOT wash away into sewer.

Methods and materials for containment and cleaning up

Neutralizing agents for acids & caustics: flush with water & rinse with dilute sodium bicarbonate or soda ash solution.

SECTION 7: Handling and storage

Precautions for safe handling

NO contact with combustible substances or reducing agents. 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. See Chemical Dangers. Well closed.REAGENT BOTTLE--MAX 1-LB, GLASS-STOPPERED, GLASS BOTTLE; KEPT IN A HEAVY GLASS TRAY WITH LARGER CAPACITY. ADDN LAB STORAGE SHOULD BE IN ORIGINAL BOTTLES INSIDE A GLASS CONTAINER PADDED WITH GLASS WOOL & HAVING GREATER CAPACITY THAN THE CONTAINER. CARBOYS & LARGE BOTTLES SHOULD BE STORED ON ACID-RESISTING NONCOMBUSTIBLE SHELVES, IN A NONCOMBUSTIBLE STRUCTURE. ALL STORAGE MUST BE SEPARATED FROM COMBUSTIBLE MATERIALS, ORG MATERIALS, STRONG DEHYDRATING AGENTS, OXIDIZING & REDUCING AGENTS. ...MUST BE STORED WHERE IT WILL NOT FREEZE... PROTECT AGAINST PHYSICAL DAMAGE. ELECTRICAL WIRING...IN STORAGE AREAS MUST BE OF WATERTIGHT TYPE TO PROTECT AGAINST CORROSIVE ACTION OF VAPORS.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

no data available

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.

Respiratory protection

Use ventilation, local exhaust or breathing protection. Use appropriate engineering controls.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Perchloric acid, with more than 50% but not more than 72% acid is a clear colorless odorless aqueous solution. Corrosive to metals and tissue. Closed containers may rupture violently under prolonged exposure to heat.
Colour:	COLORLESS, OILY LIQUID
Odour:	odorless
Melting point/freezing point:	-112°C
Boiling point or initial boiling point and boiling range:	39°C
Flammability:	Not combustible but enhances combustion of other substances. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire.

Lower and upper explosion limit/flammability limit:	no data available
Flash point:	113°C
Auto-ignition temperature:	no data available
Decomposition temperature:	19°C
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	MISCIBLE IN COLD WATER
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	6.8 mm Hg (25 °C)
Density and/or relative density:	1.664g/mLat 25°C
Relative vapour density:	~2.1 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

May explode on heating. Decomposes on heating. This produces toxic and corrosive fumes. The substance is a strong oxidant. It reacts violently with combustible and reducing materials, organic materials and strong bases. This generates fire and explosion hazard. Attacks many metals. This produces flammable/explosive gas (hydrogen - see ICSC 0001). The acid is unstable if the concentration is over 72%; may explode by shock or concussion when dry or drying. Mixtures with combustible material (such as paper) may ignite spontaneously at room temperature.

Chemical stability

VOLATILE

Possibility of hazardous reactions

AQ ACID...MAY DEFLAGRATE IN CONTACT WITH OXIDIZABLE SUBSTANCES. /AQUEOUS SOLN/PERCHLORIC ACID, [> 50% BUT <= 72% STRENGTH] is a solution of a strong oxidizing acid. May react vigorously or deflagrate when mixed with oxidizable material [Merck]. This includes (but is not limited to) alcohols, amines, boranes, dicyanogen, hydrazines, hydrocarbons, hydrogen, nitroalkanes, powdered metals, silanes, or thiols [Bretherick 1979. p.174]. Perchloric acid ignites on contact with sulfinyl chloride. (Bailar, 1973, Vol. 2, 1442).

Conditions to avoid

no data available

Incompatible materials

Mixtures of.../acetic acid, perchloric acid and acetic anhydride/ have varying degrees of sensitivity to shock. ...addition of acetic anhydride to aq soln of perchloric acid causes formation of acetic acid which can react violently with perchloric acid.

Hazardous decomposition products

Poisonous gases may be produced in fire. aqueous soln

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

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

no data available

Reproductive toxicity

no data available

STOT-single exposure

Corrosive. The vapour is very corrosive to the eyes, skin and respiratory tract. Inhalation of the vapour or mist may cause lung oedema. See Notes. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

no data available

Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation 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

no data available

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: UN1873 (For reference only, please check.)
IMDG: UN1873 (For reference only, please check.)
IATA: UN1873 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass (For reference only, please check.)
IMDG: PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass (For reference only, please check.)
IATA: PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 5.1 (For reference only, please check.)
IMDG: 5.1 (For reference only, please check.)
IATA: 5.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: I (For reference only, please check.)
IMDG: I (For reference only, please check.)
IATA: I (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

DO NOT use perchloric acid in a hood designed for other purposes. 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. Immediate administration of an appropriate inhalation therapy by a doctor, or by an authorized person, should be considered. Rinse contaminated clothing with plenty of water because of fire hazard. NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water.