Safety Data Sheet PERCHLORIC ACID

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SECTION 1: Identification

GHS Product identifier

Product name	PERCHLORIC ACID

Other means of identification

Product	Product Code
Perchloric Acid AR	PA421

Recommended use of the chemical and restrictions on use

Analytical chemistry, dehydrating agent, fluoride determination, decomposition of organic samples for the determination of mercury, electropolishing of metals, manufacture of various esters, explosives, catalyst and ingredient of electrolytic bath in deposition of lead.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Dangerous goods of Class 5.1 (Oxidizing Agent) are incompatible in a placard load with any of the following:
Class 1, Class 2.1, Class 2.3, Class 3, Class 4, Class 5.2, Class 7, Class 8, Fire risk substances and Combustible liquids.

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Acute toxicity, oral, Cat. 4
- Corrosive to metals, Cat. 1
- Oxidizing liquids, Cat. 1
- Skin corrosion/irritation, Cat. 1A

GHS label elements, including precautionary statements

Pictograms

Signal word	**Danger**

Hazard statement(s)

H271	May cause fire or explosion; strong oxidizer
H290	May be corrosive to metals
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage

Precautionary statement(s)

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.
P234	Keep only in original packaging.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P283	Wear fire resistant or flame retardant clothing.
P301+P312	IF SWALLOWED: Call a POISON CENTER/doctor/physcian if you feel unwell,
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 [or shower].
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P306+P360	IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.
P310	Immediately call a POISON CENTER/doctor/physcian
P363	Wash contaminated clothing before reuse.
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P371+P380+P375	In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
P390	Absorb spillage to prevent material-damage.
P405	Store locked up.
P406	Store in a corrosive resistant/… container with a resistant inner liner.
P420	Store separately.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight	100.47

Component	Identification	Weight %	Classifications
Water	CAS no.: 7732-18-5 EC no.: 231-791-2	30 - >= 40 %	CLASSIFICATIONS: No data available. HAZARDS: No data available.

Component	Identification	Weight %	Classifications
Perchloric acid (60-72 %)	CAS no.: 7601-90-3 EC no.: 231-512-4 Index no.: 017-006-00-4	60 - <= 70 %	CLASSIFICATIONS: Oxidizing liquids, Cat. 1; Skin corrosion/irritation, Cat. 1A; Acute toxicity, oral, Cat. 4; Corrosive to metals, Cat. 1. HAZARDS: H271 - May cause fire or explosion; strong oxidizer; H290 - May be corrosive to metals; H302 - Harmful if swallowed; H314 - Causes severe skin burns and eye damage. [SCLs/M-factors/ATEs]: Skin Corr. 1A; H314: C ≥ 50 %; Skin Corr. 1B; H314: 10 % ≤ C < 50 %; Skin Irrit. 2; H315: 1 % ≤ C < 10 %; Eye Irrit. 2; H319: 1 % ≤ C < 10 %; Ox. Liq. 1; H271: C > 50 %; Ox. Liq. 2; H272: C ≤ 50 %

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice	For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor (at once). First Aid Facilities: Maintain eyewash fountain in work area.
If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
In case of skin contact	Wash affected area thoroughly with soap and water. Remove contaminated clothing and wash before reuse or discard. If symptoms develop seek medical attention.
In case of eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. Seek immediate medical assistance.
If swallowed	Rinse mouth thoroughly with water immediately. DO NOT induce vomiting because of risk of aspiration. If vomiting occurs give further water to achieve effective dilution. Seek immediate medical assistance.

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

Indication of immediate medical attention and special treatment needed, if necessary
For advice, contact the National Poisons Information Centre (Phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Small fire: USE FLOODING QUANTITIES OF WATER. Do not use dry chemicals, CO2 or foam. If safe to do so, move undamaged containers from fire area. Do not move cargo if cargo has been exposed to heat.
Large fire: Flood fire area with water from a protected position. Cool containers with flooding quantities of water until well after fire is out - If impossible, withdraw from area and let fire burn. Avoid getting water inside containers: a violent reaction may occur. Dam fire control water for later disposal.

Specific hazards arising from the chemical

Will accelerate burning when involved in a fire. May explode from heating, shock, friction or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, clothing, etc). Fire may produce irritating, poisonous, and/or corrosive gases. Containers may explode when heated. Runoff may create fire or explosion hazard.

Special protective actions for fire-fighters
Wear SCBA and chemical splash suit. Structural firefighter's uniform will provide limited protection.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

Methods and materials for containment and cleaning up
Do not contaminate. Keep combustibles (wood, paper, clothing, oil, etc.) away from spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use water spray to knock down vapours or divert vapour clouds. Prevent entry into waterways, drains or confined areas. Prevent exposure to heat.

Small Liquid Spill
Use a non-combustible material like vermiculite, sand or earth to soak up the product and place in a loosely-covered container for later disposal.
Large Liquid Spill
SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

SECTION 7: Handling and storage

Precautions for safe handling
When dealing with this product, repeat or prolonged skin exposure without protection should be prevented in order to lessen the possibility of skin disorders. It is essential that all who are exposed to this material maintain high standards of person hygiene i.e. washing hands prior to eating, drinking, and smoking or using toilet facilities.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry well-ventilated area away from sources of ignition (and heat), out of direct sunlight, oxidising agents, foodstuff and clothing. Keep containers closed when not in use and securely sealed. Protect againt physical damage. Inspect regularly for leaks and damage. If discolouration of the acid solution occurs, the solution should be discarded. Glass, ceramic or polyethylene containers should be used for storage.

Corrosiveness: Corrosive to metals.

Storage Regulations: Refer Australian Standard AS 4326 'The storage and handling of oxidizing agents'.

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Body protection
Footwear: Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection: Clean clothing or protective clothing should be worn, preferably with and apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Recommendation: GOOD: Natural rubber; neoprene rubber; Nitrile rubber; Nitrile/polyvinylchloride; polyvinyl chloride.
FAIR/POOR: Polyvinyl alcohol (PVA).

Respiratory protection
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/ NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Liquid
Appearance	Colourless, fuming, hygroscopic liquid.
Color	No data available.
Odor	Pungent odour.
Odor threshold	No data available.
Melting point/freezing point	-18 °C (melting temperature)
Boiling point or initial boiling point and boiling range	203°C (70% solution)
Flammability	No data available.
Lower and upper explosion limit/flammability limit	No data available.
Flash point	No data available.
Explosive properties	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Oxidizing properties	No data available.
pH	<1 (H_2O, 20 °C)
Kinematic viscosity	No data available.
Solubility	Solubility in Water: Soluble.
Partition coefficient n-octanol/water (log value)	No data available.
Vapor pressure	6.8 mmHg (25°C)
Evaporation rate	No data available.
Density and/or relative density	Specific Gravity: 1.16 - 1.7 (70% solution)
Relative vapor density	No data available.
Particle characteristics	No data available.

Supplemental information regarding physical hazard classes
No data available.

Further safety characteristics (supplemental)
No data available.

SECTION 10: Stability and reactivity

Reactivity
Stable under normal conditions of storage and handling.

Chemical stability

Stable at concentrations below 73%. Concentrated solutions above 73% and the anhydrous acid are unstable. Although 68 - 72% cold perchloric acid behaves as a strong but nonoxidizing acid, it becomes an extreme oxidant and powerful dehydrator at elevated temperatures (>160 °C) or when anhydrous. It may be fairly readily dehydrated to the anhydrous acid, eg. strong concentrated acids (sulfuric, oleum, fuming nitric), inorganic anhydrides (sulfur trioxide and dioxide, phosphorous pentoxide, thionyl chloride, etc.), organic anhydrides, and halogens. Dry perchlorates can be explosive. Sensitive to heating (explosive decomposition). Hygroscopic. Evolves heat on combination with water.

Possibility of hazardous reactions
May ignite or explode spontaneously in contact with flammable and combustible materials. Mixtures with hydriodic acid may ignite spontaneously. Mixtures with sodium iodide may ignite. Forms explosive mixture with dehydrating agents and antimony compounds. Forms explosive mixture with bismuth, nitrogen triiodide and hypophosphites when heated. Contact with hydrochloric acid may cause violent decomposition. Contact with fluorine produces highly reactive fluorine perchlorate. Hydrogen may form upon contact with metals (danger of explosion!).

Hazardous Polymerization: Will not occur.

Conditions to avoid
Extremes of temperature and direct sunlight. Incompatibles.

Incompatible materials
Antimony compounds, alcohols, anhydrides, amines, acids, bismuth, combustible materials, dehydrating agents, ethers, fluorine, finely powdered metals, hydrochloric acid, hydriodic acid, hypophosphites, halogen and halogenated hydrocarbons, heat, hydrogen and hydrogen halides compounds, impurities/dust, metals, nitric acid, nitriles, nitrogen triiodide, nonmetallic oxides, organic substances, organic combustible substances, phosphorus halides, reducing agents, strong bases, strong acids, semi-metals, semimetallic oxides, sulfoxides, conc. sulfuric acid, sodium iodide, strong reducing agents.

Hazardous decomposition products
Chlorine, chlorine dioxide, chlorinated oxides, hydrochloric acid.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Acute Toxicity - Oral: LD50 (rat): 1,100 mg/kg (anhydrous substance).

Ingestion: Harmful if swallowed. Cause severe burns of the mouth, esophagus and stomach (risk of perforation) with consequent pain, nausea, vomiting, thirst, diarrhea, circulatory collapse and possibly death. Risk of cardiovascular failure.

Inhalation: Vapours or mist can cause burning sensation in nose and throat, irritation to respiratory tract, coughing, wheezing, laryngitis, shortness of breath, lung irritation, headache, nausea, vomiting, burns of mucous membranes and lungs, spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.

Skin corrosion/irritation
Causes severe burns with discoloration, redness, itching, pain and swelling. Repeated or prolonged contact may lead to dermatitis.

Serious eye damage/irritation
Corrosive. Vapour or mist causes severe eye irritation which can result in redness, pain, stinging, loss of colour vision (blue vision), corneal oedema, lachrymation and possible irreversible eye damage. Risk of blindness.

Respiratory or skin sensitization
Not classified based on available information.

Germ cell mutagenicity
Not classified based on available information.

Carcinogenicity
Not classified based on available information.

Reproductive toxicity
Not classified based on available information.

Specific target organ toxicity (STOT) - single exposure
Not classified based on available information.

Specific target organ toxicity (STOT) - repeated exposure
Not classified based on available information.

Aspiration hazard
Not classified based on available information.

Additional information
Chronic Effects: Repeated or prolonged skin contact to dilute solutions may cause dermatitis. Prolonged exposure to vapour or mist may cause severe coughing and vomiting.

SECTION 12: Ecological information

Toxicity
Biological effects: Toxic for aquatic organisms. Harmful effect due to pH shift. Does not cause biological oxygen deficit.

SECTION 13: Disposal considerations

Disposal methods

Product disposal

Disposal Considerations: Neutralise acid solution with sodium hydroxide, sodium bisulfite or soda ash to pH 7.

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1873
Class: 5.1, 8
Packing Group: I
Proper Shipping Name: PERCHLORIC ACID

Hazchem emergency action code (EAC)
2P

IMDG
UN Number: 1873
Class: 5.1, 8
Packing Group: I
EMS Number:
Proper Shipping Name: PERCHLORIC ACID

IATA
UN Number: 1873
Class: 5.1, 8
Packing Group: I

Proper Shipping Name: PERCHLORIC ACID

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: NS

SECTION 16: Other information

Further information/disclaimer
ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Preparation information
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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)