

## PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1  
Page 1 of 10

### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT NAME

PERCHLORIC ACID 70%

#### OTHER NAMES

Cl-H-O<sub>4</sub>, "perchloric acid, >50-70% solution", "perchloric acid, solution", "dioxonium perchlorate, solution", "dioxonium perchlorate, >50-70% solution", "dioxonium perchlorate, >50-72% solution", "hydronium perchlorate", "hydronium perchlorate solution",

#### PROPER SHIPPING NAME

PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass

#### PRODUCT USE

Used as laboratory reagent; in analytical chemistry; catalyst; in wet `combustion'; dehydrating agent; fluoride determination; ingredient of electrolytic bath in deposition of lead; electropolishing of metals. Also used in manufacture of explosives and various esters, and in separation of potassium from sodium.  
Reagent

#### SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

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248, Worli Road,

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### Section 2 - HAZARDS IDENTIFICATION

#### GHS Classification

Acute Toxicity Category 4

Metal Corrosion Category 1

Oxidizing Liquid Category 1

Serious Eye Damage Category 1

Skin Corrosion/Irritation Category 1A



#### EMERGENCY OVERVIEW

#### HAZARD

DANGER

Determined by using GHS criteria

H271

May cause fire or explosion; strong oxidiser.

continued...

# PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1

Page 2 of 10

## Section 2 - HAZARDS IDENTIFICATION

|      |                                          |
|------|------------------------------------------|
| H290 | May be corrosive to metals.              |
| H302 | Harmful if swallowed.                    |
| H314 | Causes severe skin burns and eye damage. |
| H318 | Causes serious eye damage.               |

### PRECAUTIONARY STATEMENTS

#### Prevention

| Code | Phrase                                                                     |
|------|----------------------------------------------------------------------------|
| P210 | Keep away from heat/sparks/open flames/hot surfaces. - No smoking.         |
| P220 | Keep/Store away from clothing/ ... /combustible materials.                 |
| P221 | Take any precaution to avoid mixing with combustibles.                     |
| P234 | Keep only in original container.                                           |
| P260 | Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.                      |
| P264 | Wash ... 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/flammable resistant/retardant clothing.                          |

#### Response

| Code           | Phrase                                                                                                                           |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| P301+P312      | IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.                                                       |
| P301+P330+P331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.                                                                               |
| P303+P361+P353 | IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.                       |
| P304+P340      | IF INHALED: Remove victim to fresh air and keep at rest in a position 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 or doctor/physician.                                                                            |
| P330           | Rinse mouth.                                                                                                                     |
| P363           | Wash contaminated clothing before reuse.                                                                                         |
| P390           | Absorb spillage to prevent material damage.                                                                                      |

#### Storage

| Code | Phrase                                                                  |
|------|-------------------------------------------------------------------------|
| P405 | Store locked up.                                                        |
| P406 | Store in corrosive resistant container or with a resistant inner liner. |

#### Disposal

| Code | Phrase                               |
|------|--------------------------------------|
| P501 | Dispose of contents/container to ... |

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                                          | CAS RN    | %   |
|-----------------------------------------------|-----------|-----|
| perchloric acid                               | 7601-90-3 | ~70 |
| NOTE: Transport Code limits strength of acid. |           |     |

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

### EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting

continued...

# PERCHLORIC ACID 70%

## GHS Safety Data Sheet

Version No:7.1.1.1

Page 3 of 10

## Section 4 - FIRST AID MEASURES

- the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

### SKIN

- If skin or hair contact occurs:
  - Immediately flush body and clothes with large amounts of water, using safety shower if available.
  - Quickly remove all contaminated clothing, including footwear.
  - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
  - Transport to hospital, or doctor.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

### NOTES TO PHYSICIAN

- For acute or short term repeated exposures to strong acids:
  - Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
  - Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling.
  - Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
  - Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

For chlorates:

For severe intoxication: Empty the stomach by lavage and aspiration or by emesis, give demulcents or sweetened drinks and maintain respiration. Pethidine may be given if required.

Antithyroid effects produced by the perchlorates may be reversed with iodine. Patients should be warned to report the development of sore throat, fever or rashes since these are indicative of blood abnormalities.

## Section 5 - FIRE FIGHTING MEASURES

### EXTINGUISHING MEDIA

- FOR SMALL FIRE:
  - USE FLOODING QUANTITIES OF WATER.
  - DO NOT use dry chemical, CO<sub>2</sub>, foam or halogenated-type extinguishers.

FOR LARGE FIRE

- Flood fire area with water from a protected position.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.

### FIRE/EXPLOSION HAZARD

- Will not burn but increases intensity of fire.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- Heat affected containers remain hazardous.
- Contact with combustibles such as wood, paper, oil or finely divided metal may produce spontaneous combustion or violent decomposition.

Decomposition may produce toxic fumes of: hydrogen chloride.

### FIRE INCOMPATIBILITY

- Avoid storage with reducing agents.
- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

continued...

# PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1

Page 4 of 10

Section 5 - FIRE FIGHTING MEASURES

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up all spills immediately.
- No smoking, naked lights, ignition sources.
- Avoid all contact with any organic matter including fuel, solvents, sawdust, paper or cloth and other incompatible materials, as ignition may result.
- Avoid breathing dust or vapours and all contact with skin and eyes.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear full body protective clothing with breathing apparatus.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid personal contact and inhalation of dust, mist or vapours.
- Provide adequate ventilation.
- Always wear protective equipment and wash off any spillage from clothing.
- Keep material away from light, heat, flammables or combustibles.

### PACKAGING MATERIAL INCOMPATIBILITIES

| Chemical Name | Container Type                                                                                                                                                |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | " Acetal (Delrin)" , Aluminum, " Buna N (Nitrile)" , " Carbon Steel"<br>, " Cast iron" , Copper, Neoprene, Nylon, Polyurethane, Silicone,<br>Titanium, Tygonr |

### SUITABLE CONTAINER

- Glass container is suitable for laboratory quantities.
  - All inner and sole packagings for substances in Packing Group I, must be hermetically sealed.
- Laboratory glass bottles should be stored inside a heavy glass tray of capacity greater than total containers.

### STORAGE INCOMPATIBILITY

- Perchloric acid:
  - decomposes explosively when anhydrous
  - solutions of 72% or more, or containing organic contaminants, are shock- and heat-sensitive explosives
  - may explode at elevated temperatures of 75 C or more
  - reacts violently when water is added to concentrated acid; heat may be generated - contact with readily oxidisable organic materials may cause spontaneous combustion.
  - Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
  - Segregate chlorates from organic matter, acids, poisonous gases, flammables, corrosives, aluminium and ammonium salts and any other combustible material.
  - Mixtures of chlorates with fibrous and absorbent organic materials such as wood, paper, leather, flour, sawdust, sugar, shellac, may be ignited or caused to explode by static sparks, friction or shock.
  - The extreme hazardous nature of mixtures of metal chlorates with phosphorus or sulfur, apart from being powerful explosives, are dangerously sensitive to friction or shock; spontaneous ignition occasionally occurs.
  - Mixtures with sucrose, lactose, chromium, sulfur dioxide, sodium amide, zirconium, germanium and titanium explode on heating.
  - Avoid storage with reducing agents.
  - Avoid strong bases.
  - Keep dry.
  - NOTE: May develop pressure in containers; open carefully. Vent periodically.
  - Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.
  - Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.

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# PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1

Page 5 of 10

Section 7 - HANDLING AND STORAGE

- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
  - The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping" can spatter the acid.
  - Oxidising agents as a class are not necessarily combustible themselves, but can increase the risk and intensity of fire in many other substances.
- for oxo halogens:
- The oxidising power of the group of oxo halogen acids increases directly with oxygen content, though the high stability of the perchlorate ion at ambient temperature must be taken into account.
  - The corresponding 'anhydrides' (halogen oxides) are also powerful oxidants, several being explosively unstable
  - Of the various compounds arising from union of oxygen with one or more halogens (halogen oxides), many are endothermic and all are generally unstable but powerful oxidants.

## STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed as supplied.
- Store in a cool, well ventilated area.
- Keep dry.

In addition, Goods of Class 5.1, packing group I should be:

- stored in a room or space with free vents
- stored in piles so that (i) the length of the pile does not exceed 3 metres; (ii) the height of the pile does not exceed 3 metres if the area is provided with automatic fire extinguishers or 1.2 metres if not.
- stored in a room that is equipped with an automatic fire sprinkler capable of a discharge rate of at least 10 litres per minute per square meter of floor area, where 1000 kgs or more of the material is to be stored.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- perchloric acid:

CAS:7601- 90- 3

### MATERIAL DATA

PERCHLORIC ACID:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations.

CEL TWA: 1 mg/m<sup>3</sup>; STEL: 2 mg/m<sup>3</sup>

[compare OEL TWA (Czechoslovakia): 1 mg/m<sup>3</sup>; STEL: 2 mg/m<sup>3</sup>]

### PERSONAL PROTECTION



### RESPIRATOR

- Type B-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

### EYE

- Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure
- Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted
- Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.

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# PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1

Page 6 of 10

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### HANDS/FEET

- Elbow length PVC gloves.

- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:.

- Neoprene rubber gloves.

### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.

### ENGINEERING CONTROLS

- Non plastic construction "dedicated" fume hoods are required if perchloric acid is used regularly or in quantity.

- DO NOT use other material in a hood designed specifically for perchloric acid processes.

- Use of this material in fume hoods of plastic construction has caused fire.

Explosive reaction may result from the interaction of strong oxidisers and organics.

- Do NOT use strong oxidising agents in fume hoods designed for other purposes. Identify fume hoods used for strong oxidising agents with large warning signs.

- Provide exhaust ventilation and room supply air in accordance with appropriate Standard.

- Utilise local exhaust ventilation within the hood to minimise condensation of vapours inside the hood.

- Locate all utility controls outside the hood.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Clear, colourless to slightly yellow highly corrosive liquid, pungent odour.

transport.

### PHYSICAL PROPERTIES

Liquid.

Corrosive.

Acid.

Reacts violently with water.

|                           |                  |                                 |                   |
|---------------------------|------------------|---------------------------------|-------------------|
| State                     | Liquid           | Molecular Weight                | Not applicable.   |
| Melting Range (°C)        | Approx. - 17     | Viscosity                       | Not Available     |
| Boiling Range (°C)        | Approx. 200- 203 | Solubility in water (g/L)       | Reacts violently  |
| Flash Point (°C)          | Not applicable.  | pH (1% solution)                | Not available.    |
| Decomposition Temp (°C)   | Not Available    | pH (as supplied)                | Not available     |
| Autoignition Temp (°C)    | Not Available    | Vapour Pressure (kPa)           | Not available.    |
| Upper Explosive Limit (%) | Not applicable.  | Specific Gravity (water=1)      | 1.41- 1.67 @ 15 C |
| Lower Explosive Limit (%) | Not applicable.  | Relative Vapour Density (air=1) | Not Available     |
| Volatile Component (%vol) | Not available.   | Evaporation Rate                | Not available     |

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable under normal handling conditions.
- Prolonged exposure to heat.
- Hazardous polymerisation will not occur.

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# PERCHLORIC ACID 70%

GHS Safety Data Sheet

Version No:7.1.1.1

Page 7 of 10

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

NOTE: May contain traces of perchloric acid or may, on contact with acids, produce an anhydrous perchloric acid an extremely reactive and explosive species. Many of the reported explosions involving perchlorate may result its ability to form unstable perchlorate esters or salts of the anhydrous acid.

### WARNING:

- On the basis of experience with cobalt(III) perchlorate, attention is drawn to the possibility of stable metal perchlorates being converted by unintentional dehydration to unstable (endothermic) lower hydrates capable of explosive decomposition in the absence of impurities. Great care must be taken to avoid dehydration or desolvation of perchlorates.
- Metal perchlorates may be explosively reactive with finely divided aluminium, magnesium and zinc and other metals, calcium and strontium hydrides, glycol (on heating), sulfuric acid (with the formation of unstable perchloric acid), and trifluoromethanesulfonic acid.

*For incompatible materials - refer to Section 7 - Handling and Storage.*

## Section 11 - TOXICOLOGICAL INFORMATION

### Health hazard summary table:

|                                   |                     |
|-----------------------------------|---------------------|
| Acute toxicity                    | Acute Tox. (oral) 4 |
| Skin corrosion/irritation         | Skin Corr. 1 A      |
| Serious eye damage/irritation     | Eye Dam. 1          |
| Respiratory or skin sensitization | Not applicable      |
| Germ cell mutagenicity            | Not applicable      |
| Carcinogenicity                   | Not applicable      |
| Reproductive toxicity             | Not applicable      |
| STOT- single exposure             | Not applicable      |
| STOT- repeated exposure           | Not applicable      |
| Aspiration hazard                 | Not applicable      |

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident.
- Symptoms of exposure to perchlorates include shortness of breath, difficulty breathing and a bluish discolouration of the skin. The effects may be delayed for several hours following exposure.
- Nausea and vomiting are almost always apparent after chlorate poisonings usually with upper stomach pain. Diarrhoea may also occur.

##### EYE

- If applied to the eyes, this material causes severe eye damage.
- Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely.

##### SKIN

- Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
- Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

- The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
- Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness.
- Inhalation of quantities of liquid mist may be extremely hazardous, even lethal due to spasm, extreme irritation of larynx and bronchi, chemical pneumonitis and pulmonary oedema.

continued...

# PERCHLORIC ACID 70%

## GHS Safety Data Sheet

Version No:7.1.1.1

Page 8 of 10

## Section 11 - TOXICOLOGICAL INFORMATION

### CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Chronic exposure may inflame the skin or conjunctiva.

Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Based on experience with animal studies, there is a possibility that exposure to the material may result in toxic effects to the development of the foetus, at levels which do not cause significant toxic effects to the mother.

Perchlorates may affect the use of iodine by the thyroid gland and chronic exposures may result in symptoms of thyroid dysfunction such as goitre.

### TOXICITY AND IRRITATION

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.

## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### Ecotoxicity

| Ingredient      | Persistence:<br>Water/Soil | Persistence: Air     | Bioaccumulation | Mobility             |
|-----------------|----------------------------|----------------------|-----------------|----------------------|
| perchloric acid | No Data<br>Available       | No Data<br>Available | LOW             | No Data<br>Available |

## Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction.
- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.

FOR DISPOSAL OF SMALL QUANTITIES:

- Cautiously acidify a 3% solution or a suspension of the material to pH 2 with sulfuric acid.
- Gradually add a 50% excess of aqueous sodium bisulfite with stirring at room temperature. (Other reducers such as thiosulfate or ferrous salts may substitute; do NOT use carbon, sulfur or other strong reducing agents). An increase in temperature indicates reaction is taking place. If no reaction is observed on the addition of about 10% of the sodium bisulfite solution, initiate it by cautiously adding more acid.
- If manganese, chromium or molybdenum are present adjust the pH of the solution to 7 and treat with sulfide to precipitate for burial as a hazardous waste. Destroy excess sulfide, neutralise and flush the solution down the drain (subject to State and Local Regulation).

[Sigma/Aldrich].

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Neutralisation with soda-ash or soda-lime

continued...

# PERCHLORIC ACID 70%

## GHS Safety Data Sheet

Version No:7.1.1.1

Page 9 of 10

### Section 13 - DISPOSAL CONSIDERATIONS

followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material).

- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.

For small quantities of oxidising agent:

- Cautiously acidify a 3% solution to pH 2 with sulfuric acid.
- Gradually add a 50% excess of sodium bisulfite solution with stirring.
- Add a further 10% sodium bisulfite.
- If no further reaction occurs (as indicated by a rise in temperature) cautiously add more acid.

### Section 14 - TRANSPORTATION INFORMATION



Labels Required: OXIDIZING AGENT,CORROSIVE

#### HAZCHEM:

2P

Land Transport UNDG:

|                    |      |                   |   |
|--------------------|------|-------------------|---|
| Class or division: | 5.1  | Subsidiary risk:  | 8 |
| UN No.:            | 1873 | UN packing group: | I |

Shipping Name:PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass with more than 50% but not more than 72% acid, by mass

#### Air Transport IATA:

|                       |           |                     |           |
|-----------------------|-----------|---------------------|-----------|
| ICAO/IATA Class:      | 5.1       | ICAO/IATA Subrisk:  | 8         |
| UN/ID Number:         | 1873      | Packing Group:      | I         |
| Special provisions:   | None      |                     |           |
| Cargo Only            |           |                     |           |
| Packing Instructions: | 553       | Maximum Qty/Pack:   | 2.5 L     |
| Passenger and Cargo   |           | Passenger and Cargo |           |
| Packing Instructions: | Forbidden | Maximum Qty/Pack:   | Forbidden |
| Passenger and Cargo   |           | Passenger and Cargo |           |
| Limited Quantity      |           | Limited Quantity    |           |
| Packing Instructions: | Forbidden | Maximum Qty/Pack:   | Forbidden |

Shipping name:PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass

**Maritime Transport IMDG:** IMDG Class:5.1 IMDG Subrisk:8 UN Number:1873 Packing Group:I EMS Number:F-A,S-Q

Shipping name:PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass

### Section 15 - REGULATORY INFORMATION

#### REGULATIONS

**perchloric acid (CAS: 7601-90-3) is found on the following regulatory lists;**

"FisherTransport Information","India Hazardous Wastes (Management, Handling and Transboundary Movement) Rules - Schedule 2: List of Wastes Constituents with Concentration Limits","India Manufacture, Storage and Import of Hazardous Chemical Rules - Schedule 1: List of Hazardous and Toxic Chemicals","International Air Transport Association (IATA) Dangerous Goods Regulations",  
"International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft",  
"International Maritime Dangerous Goods Requirements (IMDG Code) - Goods Forbidden for Transport","OECD List of High Production Volume (HPV) Chemicals","Sigma-AldrichTransport Information"

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**Section 16 - OTHER INFORMATION**

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- Classification of the preparation and its individual components has drawn on official and authoritative sources using available literature references.
  
- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

Issue Date: 2-Jan-2018