

catalyst and solvent in organic synthesis. As "spirits of salts" for cleaning of lime and masonry from new brickwork. As flux or flux component for soldering; manufacture of "killed spirits".

PHYSICAL DESCRIPTION / PROPERTIES



APPEARANCE

Clear to light yellow (orange tint for inhibited grades) fuming corrosive liquid with sharp, suffocating odour. CARE: mixes with water but generates heat, may cause dangerous boiling. Concentrate and solutions are acidic and strongly corrosive. Material is a solution of corrosive hydrogen chloride gas in water. Commercial grades contain 28-37% hydrogen chloride HCl and at room temperature slowly gives off significant levels of acidic HCl gas. Odour becomes disagreeable at 5-10 ppm.

Boiling Point	> 50.5
Melting Point	> -74
Vapour Pressure (kPa)	< 24.8 @ 25 C
Specific Gravity	< 1.19 @ 20
Flash Point (deg C)	Not combustible
Lower Explosive Limit (%)	Not applicable.
Upper Explosive Limit (%)	Not applicable.
Solubility in Water (g/L)	Miscible

INGREDIENTS

NAME	CAS RN	%
Hydrochloric Acid	7647-01-0	33

HEALTH HAZARD



ACUTE HEALTH EFFECTS

SWALLOWED

Considered an unlikely route of entry in commercial/industrial environments The liquid is extremely corrosive if swallowed and is capable of causing burns to mouth, throat, oesophagus, with extreme discomfort, pain and may be fatal if swallowed in quantity. Ingestion may result in nausea, abdominal irritation, pain and vomiting.

EYE

Eye contact is extremely painful and may cause rapid corneal damage The liquid is extremely corrosive to the eyes and is capable of causing severe damage with loss of sight. The vapour is highly discomforting and may be corrosive to the eyes. The vapour from heated material is extremely discomforting to the eyes. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

SKIN

The liquid is extremely corrosive to the skin and is capable of causing severe burns if exposure is prolonged. Bare unprotected skin should not be exposed to this material. The material may accentuate any pre-existing skin condition. The vapour is discomforting to the skin.

INHALED

The vapour is highly discomforting to the upper respiratory tract. Inhalation hazard is increased at higher temperatures. The vapour from heated material is extremely discomforting to the upper respiratory tract and lungs if inhaled. A single severe exposure may cause coughing and choking; bleeding of nose, inflammation and occasionally ulceration of the nose, throat and larynx. Continued severe exposure can result in pulmonary oedema and corrosion of tissues in the nose and throat.

CHRONIC HEALTH EFFECTS

Highly corrosive. and Considered toxic by all exposure routes. Principal routes of exposure are usually by skin contact / eye contact with the liquid and inhalation of vapour. As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice. Repeated exposure to low vapour concentrations can cause skin tenderness, bleeding of the nose and gums, chronic bronchitis, gastritis.

FIRST AID

SWALLOWED

Rinse mouth out with plenty of water.

If poisoning occurs, contact a doctor or Poisons Information Centre.

In Australia phone 13 1126; New Zealand 03 4747000.

If swallowed, do NOT induce vomiting. Give a glass of water.

EYE

If this product comes in contact with the eyes:

- 1: Immediately hold the eyes open and wash continuously for at least 15 minutes with fresh running water.
- 2: Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- 3: Transport to hospital or doctor without delay.
- 4: Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If this product comes in contact with the skin:

- 1: Immediately flush body and clothes with large amounts of water, using safety shower if available.
- 2: Quickly remove all contaminated clothing, including footwear.
- 3: Wash affected areas with water (and soap if available) for at least 15 minutes.
- 4: Transport to hospital, or doctor.

INHALED

1: If fumes or combustion products are inhaled: Remove to fresh air.

2: Lay patient down. Keep warm and rested.

3: If breathing is shallow or has stopped, ensure clear airway and apply resuscitation, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

4: Transport to hospital, or doctor.

ADVISE TO THE DOCTOR

For acute or short term repeated exposures to strong acids:

1. Airway problems may arise from laryngeal edema and inhalation exposure.

Treat with 100% oxygen initially.

2. Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling

3. Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.

4. Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the desiccating action of the acid on proteins in specific tissues.

INGESTION:

1. Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.

2. Do not attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.

3. Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.

4. Charcoal has no place in acid management.

5. Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:

1. Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.

2. Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:

1. Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. Do not use neutralising agents or any other additives. Several litres of saline are required.

2. Cycloplegic drops (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.

3. Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

PRECAUTIONS FOR USE



EXPOSURE STANDARDS

TLV C: 5 ppm, 7.5 mg/m³ as hydrogen chloride

ES Peak: 5 ppm; 7.5 mg/m³ as hydrogen chloride

OES TWA: 1 ppm, 2 mg/m³; STEL: 5 ppm, 8 mg/m³ (as gas and aerosol mists)

MAK value: 5 ppm, 7 mg/m³

MAK Category I Peak Limitation: For local irritants

Allows excursions of twice the MAK value for 5 minutes at a time, 8 times per shift.

MAK Group C: There is no reason to fear risk of damage to the developing embryo when MAK and BAT values are observed.

MAK values, and categories and groups are those recommended within the Federal Republic of Germany.

Odour Threshold Value: 0.262 ppm (detection), 10.06 ppm (recognition)

IDLH Level: 100 ppm

NOTE: Detector tubes for hydrochloric acid, measuring in excess of 1 ppm, are available commercially.

Hydrogen chloride is a strong irritant to the eyes, mucous membranes and skin. Chronic exposure produces a corrosive action on the teeth. Reports of respiratory irritation following short-term exposure at 5 ppm have led to the recommended TLV-C. There is no indication that skin contact with hydrogen chloride elicits systemic poisoning and a skin designation has not been applied.

Exposure of humans to hydrogen chloride at 50 to 100 ppm for 1 hour is reported to be barely tolerable; 35 ppm caused irritation of the throat on short exposure and 10 ppm was the maximal concentration for prolonged exposure. It has been stated that hydrogen chloride at concentrations of 5 ppm is immediately irritating.

ENGINEERING CONTROLS

Use in a well-ventilated area and Local exhaust ventilation may be required for safe working, i.e. to keep exposures below required standards, otherwise PPE is required. If risk of inhalation or overexposure exists, wear SAA approved respirator or work in fume hood. Hydrogen chloride vapours will not be adequately absorbed by organic vapour respirators. [NSW D.I.R.]

PERSONAL PROTECTION

EYES

Chemical goggles Full face shield.

Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

HANDS / FEET

Barrier cream and Neoprene gloves or Elbow length PVC gloves. Nitrile gloves.

PVC boots or PVC safety gumboots.

OTHER

Operators should be trained in procedures for safe use of this material. Acid-resistant overalls or PVC apron or PVC protective clothing.

Eyewash unit. Ensure there is ready access to an emergency shower.

RESPIRATOR

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Protection Factor	Half Face Respirator	Full Face Respirator	Powered Air Respirator
10 x ES	B -AUS P	-	B -PAPR-AUS P
50 x ES	-	B -AUS P	-
100 x ES	-	B -2 P	B -PAPR-2 P ^

^ - Full-face.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information, consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

SAFE HANDLING



STORAGE AND TRANSPORT

SUITABLE CONTAINER

Packaging as recommended by manufacturer.

Check that containers are clearly labelled.

Packs of 2.5 litres or less require a child-resistant closure.

Glass container or Plastic carboy or Polylined drum.

STORAGE INCOMPATIBILITY

Segregate from alkalis, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

Avoid storage with metals, metal oxides, hydroxides, amines, carbonates, alkaline materials, acetic anhydride, cyanides, sulphides, sulphites, phosphides, acetylides, borides, carbides, silicides, vinyl acetate, formaldehyde and potassium permanganate.

Reacts with zinc, brass, galvanised iron, aluminium, copper and copper alloys.

STORAGE REQUIREMENTS

Floors should be covered or coated with acid resistant material.

1: Store in original containers.

2: Keep containers securely sealed.

3: Store in a cool, dry, well-ventilated area.

4: Store away from incompatible materials and foodstuff containers.

5: Protect containers against physical damage and check regularly for leaks.

6: Observe manufacturer's storing and handling recommendations.

TRANSPORTATION

Class 8 - Corrosives shall not be loaded in the same vehicle or packed in the same freight container with:

Class 1 - Explosives;

Class 4.3 - Dangerous when wet substances;

Class 5.1 - Oxidising agents;

Class 5.2 - Organic peroxides;

Class 7 - Radioactive substances;

Class 8 - Acids only;

Food and food packaging in any quantity.

SPILLS AND DISPOSAL

MINOR SPILLS

DO NOT touch the spill material Clean up all spills immediately.

Wear fully protective PVC clothing and breathing apparatus.

Contain and absorb spill with sand, earth, inert material or vermiculite.

Use soda ash or slaked lime to neutralise.

Collect residues and place in labelled plastic containers with vented lids.

MAJOR SPILLS

DO NOT touch the spill material Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

Shut off all possible sources of ignition and increase ventilation.

1: Wear full body protective clothing with breathing apparatus.

2: Prevent, by any means available, spillage from entering drains or water courses.

Contain and absorb spill with sand, earth, inert material or vermiculite.

Use soda ash or slaked lime, mixed and sprayed with water, to neutralise.

DO NOT USE WATER OR NEUTRALISING AGENTS INDISCRIMINATELY ON LARGE SPILLS.

If contamination of drains or waterways occurs, advise emergency services.

Collect residues and place in labelled plastic containers with vented lids.

Water spray or fog may be used to disperse vapour.

Collect recoverable product into labelled containers for recycling.

DISPOSAL

Recycle wherever possible. Consult manufacturer for recycling options.

Consult State Land Waste Management Authority for disposal.

Treat and neutralise at an effluent treatment plant.

Bury residue in an authorised landfill.

Decontaminate empty containers with a lime slurry.

Return empty containers to supplier or bury empty containers at an authorised landfill.

WASTE DISPOSAL PROCEDURES

"Wear protective clothing, nitrile rubber gloves, eye protection and a self contained breathing apparatus to control personal contact from hydrochloric acid. "

"In a well ventilated area, add the hydrochloric acid to cold water. Neutralise the contents with soda ash or calcium carbonate. Wash the solution into the drain. Dispose of any recoverable solid with normal refuse [Armour 1996]."

SPILLAGE DISPOSAL

"Clear area of personnel. Wear protective clothing, nitrile rubber gloves, eye protection and breathing apparatus to control personal contact from hydrochloric acid. "

"Cover the spill with a 1:1:1 mixture by weight of calcium carbonate or sodium carbonate, bentonite and sand. Scoop the absorbed hydrochloric acid mixture into a container and transfer to a well ventilated area. "

"Add the mixture to a container of cold water. Neutralise with sodium carbonate, and decant the solution into the drain. Discard any recoverable solid with normal refuse [Armour 1996]."

FIRE/EXPLOSION HAZARD

Non combustible liquid

Will not burn, but heat produces highly toxic fumes/vapours.

Heating may cause expansion or decomposition leading to violent rupture of containers.

Decomposes on heating and produces toxic fumes of hydrogen chloride.

Decomposition may produce toxic fumes of chlorine.

Reacts with metals producing flammable / explosive hydrogen gas.

CONTACT POINT



In the event of a chemical event of a chemical incident phone **0800 243 622** for immediate assistance.

AUSTRALIAN POISONS INFORMATION CENTRE

24 HOUR SERVICE: 13 11 26
POLICE, FIRE BRIGADE OR AMBULANCE: 000

NEW ZEALAND POISONS INFORMATION CENTRE

24 HOUR SERVICE: 0800 POISON or +643 353 0199
NZ EMERGENCY SERVICES: 111

End of Report (REVIEW)

Date of preparation Mon 29-Jan-2001

Print Date Tue 4-Dec-2001

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