

SARAYA ACECIDE (REAGENT 1)

Chemwatch Independent Material Safety Data Sheet

Issue Date: 5-Mar-2010

NC317ECP

CHEMWATCH 4695-69

Version No:3

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

SARAYA ACECIDE (REAGENT 1)

SYNONYMS

"Product Code: F269-5", "Peracetic acid solution in equilibrium"

PROPER SHIPPING NAME

OXIDIZING LIQUID, CORROSIVE, N.O.S.(contains peracetic acid)

PRODUCT USE

■ Used according to manufacturer's directions.

SUPPLIER

Company: Saraya Australia Pty Ltd

Address:

Unit 12, 2- 4 Northumberland Drive

Caringbah

NSW, 2229

AUS

Telephone: +61 2 9542 7400

Emergency Tel: +61 2 9542 7400

Fax: 02 9542 7477

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

POISONS SCHEDULE

S6

RISK

Risk Codes

R08

R21/22

R34

R40(3)

R41

Risk Phrases

■ Contact with combustible material may cause fire.

■ Harmful in contact with skin and if swallowed.

■ Causes burns.

■ Limited evidence of a carcinogenic effect.

■ Risk of serious damage to eyes.

SAFETY

Safety Codes

S01

S17

S23

S25

S36

S51

S09

S40

S07

Safety Phrases

■ Keep locked up.

■ Keep away from combustible material.

■ Do not breathe gas/ fumes/ vapour/ spray.

■ Avoid contact with eyes.

■ Wear suitable protective clothing.

■ Use only in well ventilated areas.

■ Keep container in a well ventilated place.

■ To clean the floor and all objects contaminated by this material use water.

■ Keep container tightly closed.

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Section 2 - HAZARDS IDENTIFICATION

S27	■ Take off immediately all contaminated clothing.
S45	■ In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
S46	■ If swallowed IMMEDIATELY contact Doctor or Poisons Information Centre (show this container or label).
S60	■ This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
acetic acid glacial	64-19-7	30-60
peracetic acid	79-21-0	5.4-6.8
hydrogen peroxide	7722-84-1	<10
water	7732-18-5	NotSpec

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.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

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 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.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

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

- - 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

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Section 4 - FIRST AID MEASURES

(yet) manifested.

- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

This must definitely be left to a doctor or person authorised by him/her.

(ICSC13719).

- 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.

- Transport to hospital, or doctor, without delay.

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.

INGESTION:

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

- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.

- 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.

- Charcoal has no place in acid management.

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

SKIN:

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

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

EYE:

- 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.

- 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.

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

[Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

■ FOR SMALL FIRE:

- USE FLOODING QUANTITIES OF WATER.

- DO NOT use dry chemical, CO₂, 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.

- Wear full body protective clothing with breathing apparatus.

- Prevent, by any means available, spillage from entering drains or water course.

- Use fire fighting procedures suitable for surrounding area.

- Do not approach containers suspected to be hot.

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Section 5 - FIRE FIGHTING MEASURES

- Cool fire exposed containers with water spray from a protected location.

- If safe to do so, remove containers from path of fire.

- Equipment should be thoroughly decontaminated after use.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

FIRE/EXPLOSION HAZARD

■ - The material is not readily combustible under normal conditions.

- However, it will break down under fire conditions and the organic component may burn.

- Not considered to be a significant fire risk.

- Heat may cause expansion or decomposition with violent rupture of containers.

- Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).

- May emit acrid smoke.

Decomposes on heating and produces toxic fumes of: carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY

■ - Avoid storage with reducing agents.

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

HAZCHEM

2W

PERSONAL PROTECTION

Glasses:

Full face- shield.

Gloves:

PVC chemical resistant type.

Respirator:

Type AB Filter of sufficient capacity

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.

- Control personal contact by using protective equipment.

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

- DO NOT use sawdust as fire may result.

- Scoop up solid residues and seal in labelled drums for disposal.

- Neutralise/decontaminate area.

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.

- Prevent, by any means available, spillage from entering drains or water course.

- Consider evacuation (or protect in place).

- No smoking, flames or ignition sources.

- Increase ventilation.

- Contain spill with sand, earth or other clean, inert materials.

- NEVER use organic absorbents such as sawdust, paper, cloth; as fire may result.

- Avoid any contamination by organic matter.

- Use spark-free and explosion-proof equipment.

- Collect any recoverable product into labelled containers for possible recycling.

- DO NOT mix fresh with recovered material.

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Section 6 - ACCIDENTAL RELEASE MEASURES

- Collect residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- Decontaminate equipment and launder all protective clothing before storage and re-use.
- If contamination of drains or waterways occurs advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

acetic acid glacial 250ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

acetic acid glacial 35ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

acetic acid glacial 5ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

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.
- Keep cool, dry and away from incompatible materials.
- Avoid physical damage to containers.
- DO NOT repack or return unused portions to original containers. Withdraw only sufficient amounts for immediate use.
- Contamination can lead to decomposition leading to possible intense heat and fire.
- When handling NEVER smoke, eat or drink.
- Always wash hands with soap and water after handling.
- Use only good occupational work practice.
- Observe manufacturer's storing and handling directions.

SUITABLE CONTAINER

- - DO NOT repack. Use containers supplied by manufacturer only.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids:

- Removable head packaging and
- cans with friction closures may be used.

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Section 7 - HANDLING AND STORAGE

-
Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.

-
In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.

-
* unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

STORAGE INCOMPATIBILITY

- - Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Avoid strong bases.
- Oxidising agents as a class are not necessarily combustible themselves, but can increase the risk and intensity of fire in many other substances.
- Avoid storage with reducing agents.

STORAGE REQUIREMENTS

- - Store in original containers.
 - Keep containers securely sealed as supplied.
 - Store in a cool, well ventilated area.
 - Keep dry.
 - Store under cover and away from sunlight.
 - Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction.
 - Store away from incompatible materials and foodstuff containers.
 - DO NOT stack on wooden floors or pallets.
 - Protect containers from physical damage.
 - Check regularly for leaks.
 - Observe manufacturer's storage and handling recommendations.
- Store at 0-25 degC.
Use plastic pallets.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³
Australia Exposure Standards	acetic acid glacial (Acetic acid)	10	25	15	37
Australia Exposure Standards	hydrogen peroxide (Hydrogen peroxide)	1	1.4		

The following materials had no OELs on our records

- peracetic acid: CAS:79- 21- 0
- water: CAS:7732- 18- 5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m ³)	Revised IDLH Value (ppm)
acetic acid glacial		50
hydrogen peroxide		75 [Unch]

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

MATERIAL DATA

SARAYA ACECIDE (REAGENT 1):

Not available

ACETIC ACID GLACIAL:

■ for acetic acid:

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

Exposure at or below the TLV-TWA and TLV-STEL is thought to protect the worker against conjunctival, nose and respiratory tract irritation.

Odour Safety Factor(OSF)

OSF=21 ("ACETIC ACID, GLACIAL").

PERACETIC 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. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

MAK IIIB: Substances suspected of having carcinogenic potential.

Genotoxic studies with peracetic acid have yielded positive results in tests for chromosomal aberrations and for sperm anomalies in mice.

Carcinogenicity studies, suggest that peracetic acid, in common with other highly irritating substances, exhibits promoting activity.

HYDROGEN PEROXIDE:

■ for hydrogen peroxide

NOTE: Detector tubes for hydrogen peroxide, measuring in excess of 0.1 ppm, are available commercially.

Exposure at or below the TLV-TWA is thought to minimise irritation and bleaching of hair.

WATER:

■ No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION

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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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

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

OTHER

- - Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

RESPIRATOR

■ Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	AB- AUS	-
1000	50	-	AB- AUS
5000	50	Airline *	-
5000	100	-	AB- 2
10000	100	-	AB- 3
	100+		Airline**

* - Continuous Flow

** - Continuous-flow or positive pressure demand.

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.

ENGINEERING CONTROLS

■ General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear, colourless liquid with sharp pungent odour; mixes with water.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Corrosive.

Acid.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

State	Liquid	Molecular Weight	Not Applicable
Melting Range (°C)	Not Available	Viscosity	0.513 cSt@ 20°C
Boiling Range (°C)	Not Available	Solubility in water (g/L)	Miscible
Flash Point (°C)	Not Applicable	pH (1% solution)	2.7- 3.3 (1% solution)
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not Available
Autoignition Temp (°C)	Not Available	Vapour Pressure (kPa)	Not Available
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	1.089
Lower Explosive Limit (%)	Not Available	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.
- For incompatible materials - refer to Section 7 - Handling and Storage.*

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

- There is some evidence to suggest that this material can cause, if swallowed once, irreversible damage of organs.
- 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. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of oesophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the oesophageal or pyloric sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.
- Ingestion of low-molecular organic acid solutions may produce spontaneous haemorrhaging, production of blood clots, gastrointestinal damage and narrowing of the oesophagus and stomach entry.

EYE

- 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. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

SKIN

- There is some evidence to suggest that this material, on a single contact with skin, can cause irreversible damage of organs.
- 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.
- 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

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Section 11 - TOXICOLOGICAL INFORMATION

is suitably protected.

INHALED

■ There is some evidence to suggest that this material can cause, if inhaled once, irreversible damage of organs.

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. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset.

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.

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.

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

There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.

Persistent exposure over a long period of time to peroxides produces allergic skin reactions (redness and scaling of the skin) and asthmatic wheezing.

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (Rat) LD50: >2600 mg/kg

IRRITATION

ACETIC ACID GLACIAL:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (human) TDLo: 1.47 mg/kg

Unreport (man) LDLo: 308 mg/kg

Oral (rat) LD50: 3310 mg/kg

Inhalation (human) TCLo: 816 ppm/3 min

Inhalation (rat) LCLo: 16000 ppm/4 hr

Dermal (rabbit) LD50: 1060 mg/kg

IRRITATION

Skin (human): 50mg/24hr - Mild

Skin (rabbit): 525mg (open)- SEVERE

Eye (rabbit): 0.05mg (open)- SEVERE

■ 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. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.

NOAELs following repeated exposure to acetic acid and its salts range from 210 mg/kg bw/day (2-4 month acetic

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Section 11 - TOXICOLOGICAL INFORMATION

acid drinking water study; systemic toxicity) to 3600 mg/kg bw/day (acetic acid, sodium salt, 4 week dietary study; no effects reported). Signs of irritation/corrosion at the site of contact as well as systemic toxicity have been reported. Prolonged inhalation exposure to acetic acid results in muscle imbalance, increase in blood cholinesterase activity, decreases in albumins and decreased growth at concentrations greater than 0.01 mg/m³/day.

Groups of 20 mice/sex were given 0.025% sodium acetate in drinking water (about 60 mg/kg bw/day) for 1 week before breeding, during a 9-day breeding period and (females only) throughout pregnancy, lactation and until the offspring were weaned at 3 weeks of age. No effects on fertility were observed. The male offspring were given the same solution until they were 5-7 weeks old and were then examined in a 24-hour activity test. Examination of the litters revealed no overt deformities and normal pup weights at day 1 and day 21. The activity of offspring of the treated group was lower than that of controls during the first 12 hours but was similar during the second 12 hours. It is unknown if the decreased activity observed in the sodium acetate treated group was a result of exposure in utero and/or post-weaning, since the pups were exposed during both time periods.). Acetic acid had no effects on implantation or on maternal or fetal survival in rats, mice or rabbits dosed via gavage during gestation days 6-19 at doses up to 1600 mg/kg/day. The number of abnormalities seen in either soft or skeletal tissues of the test groups did not differ from the number occurring in the controls. Sodium acetate had no effect on pregnant mice or offspring when mice were administered 1000 mg/kg bw, by gavage on days 8-12 of gestation.

PERACETIC ACID:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Oral (rat) LD50: 1540 mg/kg

Oral (g.pig) LD50: 10 mg/kg

Inhalation (rat) LC50: 450 mg/m³

Dermal (rabbit) LD50: 1410 mg/kg

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.

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. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Data is for 40% peracetic acid

NOTE: Equivocal tumorigen by RTECS criteria

IRRITATION

Skin (rabbit): 500 mg Open SEVERE

Eye (rabbit): 1 mg SEVERE

HYDROGEN PEROXIDE:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

Dermal (rabbit) LD50: 4060 mg/kg

Dermal (rabbit) LDLo: 500 mg/kg

Inhalation (mouse) LC50: 2000 mg/kg/4h

■ 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. Key criteria for the diagnosis of RADS

IRRITATION

Nil Reported

continued...

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Section 11 - TOXICOLOGICAL INFORMATION

include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. For hydrogen peroxide:

Hazard increases with peroxide concentration, high concentrations contain an additive stabiliser.

Pharmacokinetics

Hydrogen peroxide is a normal product of metabolism. It is readily decomposed by catalase in normal cells. In experimental animals exposed to hydrogen peroxide, target organs affected include the lungs, intestine, thymus, liver, and kidney, suggesting its distribution to those sites.

Hydrogen peroxide has been detected in breath.

- Absorption: Hydrogen peroxide is decomposed in the bowel before absorption . When applied to tissue, solutions of hydrogen peroxide have poor penetrability .

- Distribution Hydrogen peroxide is produced metabolically in intact cells and tissues. It is formed by reduction of oxygen either directly in a two-electron transfer reaction, often catalysed by flavoproteins, or by an initial one-electron step to O₂ followed by dismutation to hydrogen peroxide .

- Hydrogen peroxide has been detected in serum and in intact liver. based on the results of toxicity studies, the lungs, intestine, thymus, liver, and kidney may be distribution sites. In rabbits and cats that died after intravenous administration of hydrogen peroxide, the lungs were pale and emphysematous . Following intraperitoneal injection of hydrogen peroxide in mice, pyknotic nuclei were induced in the intestine and thymus (IARC 1985). Degeneration of hepatic and renal tubular epithelial tissue was observed following oral administration of hydrogen peroxide to mice .

- Metabolism Glutathione peroxidase, responsible for decomposing hydrogen peroxide, is present in normal human tissues (IARC 1985). When hydrogen peroxide comes in contact with catalase, an enzyme found in blood and most tissues, it rapidly decomposes into oxygen and water .

- Excretion Hydrogen peroxide has been detected in human breath at levels ranging from 1.0+/-0.5 :g/L to 0.34+/-0.17 :g/L

Carcinogenicity

Gastric and duodenal lesions including adenomas, carcinomas, and adenocarcinomas have been observed in mice treated orally with hydrogen peroxide. Marked strain differences in the incidence of tumors have been observed. Papilloma development has been observed in mice treated by dermal application.

Genotoxicity

Hydrogen peroxide induced DNA damage, sister chromatid exchanges and chromosomal aberrations in mammalian cells in vitro . Hydrogen peroxide induced DNA damage in bacteria (E. coli), and was mutagenic to bacteria (Salmonella typhimurium) and the fungi, Neurospora crassa and Aspergillus chevallieri, but not to Streptomyces griseoflavus. It was not mutagenic to Drosophila melanogaster or to mammalian cells in vitro.

Developmental Toxicity

Malformations have been observed in chicken embryos treated with hydrogen peroxide, but experiments with mice and rats have been negative.

Female rats that received 0.45% hydrogen peroxide (equivalent to approximately 630 mg/kg/day)⁷ as the sole drinking fluid for five weeks produced normal litters when mated with untreated males.

Doses of 1.4 to 11 :mol/egg hydrogen peroxide (purity 30%) dissolved in water were injected into the airspace of groups of 20-30 white leghorn chicken eggs on day 3 of incubation.

Embryos were examined on day 14. The incidence of embryonic deaths and malformations was dose-related and detected at doses of 2.8 :mol/egg and above. The combined ED₅₀ was 2.7 :mol/egg

Reproductive Toxicity

A 1% solution of hydrogen peroxide (equivalent to 1900 mg/kg/day) given as the sole drinking fluid to three-month-old male mice for 7-28 days did not cause infertility.

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

continued...

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CARCINOGEN

Hydrogen peroxide	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
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Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

ACETIC ACID GLACIAL:

PERACETIC ACID:

HYDROGEN PEROXIDE:

SARAYA ACECIDE (REAGENT 1):

- DO NOT discharge into sewer or waterways.

SARAYA ACECIDE (REAGENT 1):

Marine Pollutant: Not Determined

Cyprinus carpio 24hr LC50 51 mg/L

Cyprinus carpio 48 hr LC50 51 mg/kg

Ceriodaphnia dubai 3 hr LC50 79 mg/kg

ACETIC ACID GLACIAL:

- Fish LC50 (96hr.) (mg/l): 88, 92
- Daphnia magna EC50 (48hr.) (mg/l): 32
- Algae IC50 (72hr.) (mg/l): 90
- log Kow (Prager 1995): - 0.31
- log Kow (Sangster 1997): - 0.17
- log Pow (Verschuereen 1983): 1.8E+0

■ Ecotoxicity:

The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5.

■ Acetic acid and its salts (the acetates) can be grouped together because of their close structural relationships, their natural occurrence in plants and animals, and their fundamental role in cell metabolism, particularly in the tricarboxylic acid cycle (also known as the citric acid or Krebs's cycle), which is where humans get their energy.

- Acetic acid is degraded photochemically in the atmosphere to produce hydroxyl radicals (estimated typical half-life of 22 days). Physical removal of acetates on atmospheric particulates may occur via wet or dry deposition.

- Natural water will neutralise dilute solutions of acetic acid.

- Spills of acetic acid on soil will readily biodegrade - the biodegradation rate for acetic acid after 14 days under aerobic conditions is 74 days.

- In invertebrates the toxicity of acetic acid (EC50 = 50-450 mg/L, depending on test species) -under static conditions, the 48 hour EC50 value for acetic acid is 65 mg/L for aquatic invertebrates (the test media was not neutralised). When the test solutions are neutralised, to form acetates, the static 48 hour EC50 for acetic acid is 6000 mg/L. In renewal systems with aquatic invertebrates, 48 hour EC50s for acetic acid are 100 mg/L and 180 mg/L.

- Fish LC50 (96 h): 75-88 mg/L.

- Acetic acid is not expected to bioconcentrate in the aquatic system.

- Low concentrations of acetic acid are harmful to fish.

- Drinking water standards: none available.

- Soil Guidelines: none available.

- Air Quality Standards: none available.

continued...

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

PERACETIC ACID:

■ Half- life Soil - High (hours):	48
■ Half- life Soil - Low (hours):	4
■ Half- life Air - High (hours):	138
■ Half- life Air - Low (hours):	13.8
■ Half- life Surface water - High (hours):	168
■ Half- life Surface water - Low (hours):	4
■ Half- life Ground water - High (hours):	336
■ Half- life Ground water - Low (hours):	48
■ Aqueous biodegradation - Aerobic - High (hours):	168
■ Aqueous biodegradation - Aerobic - Low (hours):	24
■ Aqueous biodegradation - Anaerobic - High (hours):	672
■ Aqueous biodegradation - Anaerobic - Low (hours):	96
■ Photooxidation half- life water - High (hours):	198
■ Photooxidation half- life water - Low (hours):	4
■ Photooxidation half- life air - High (hours):	138
■ Photooxidation half- life air - Low (hours):	13.8

- Very toxic to aquatic organisms.
- Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

HYDROGEN PEROXIDE:

- For hydrogen peroxide:

log Kow : -1.36

Environmental fate:

Hydrogen peroxide is a naturally occurring substance (typical background concentrations < 1 - 30 g/l). Almost all cells with the exception of anaerobic bacteria produce it in their metabolism. Hydrogen peroxide is a reactive substance in the presence of other substances, elements, radiation, materials and can be degraded by micro-organisms or higher organisms.

Air : Hydrogen peroxide may be removed from the atmosphere by photolysis giving rise to hydroxyl radicals, by reaction with hydroxyl radicals, or by heterogenous loss processes such as rain-out. Significantly higher hydrogen peroxide concentrations are found in polluted atmospheres as compared with clean air. These concentrations are believed to arise from photochemically-initiated oxidation of reactive hydrocarbons . Under severe smog conditions, daytime levels of hydrogen peroxide as high as 0.18 ppm have been reported, but atmospheric night-time levels of 2-5 ppb did not correlate to smog intensity

Soil: No information was found in the secondary sources searched regarding the transformation or persistence of hydrogen peroxide in soil, however, solutions of hydrogen peroxide gradually deteriorate

Water Hydrogen peroxide is a naturally occurring substance. Surface water concentrations of hydrogen peroxide have been found to vary between 51-231 mg/L, increasing both with exposure to sunlight and the presence of dissolved organic matter

Hydrogen peroxide degrades by various mechanisms, including chemical reduction and enzymatic (catalase and peroxidase) decomposition by algae, zooplankton, and bacteria. Microorganisms, especially bacteria, account for the majority of degradation, significantly more than all other chemical and biological mechanisms. The rate at which hydrogen peroxide decomposes in natural water can vary from a few minutes to more than a week, depending on numerous chemical, biological, and physical factors.

Hydrogen peroxide is rapidly degraded in a biological waste water treatment plant. Hydrogen peroxide adsorbs poorly to sediment particles and is rapidly degraded, thus accumulation in the sediment is also not expected

Hydrogen peroxide (log Kow < -1) is an inorganic substance and therefore shows little potential to bioaccumulate.

Ecotoxicity:

Fish LC50 (96 h): catfish 37.4 mg/l

Fish LC50 (24 h): mackerel 89 mg/l; chameleon gobi 155 mg/l

Zebra mussel LC50 (28 h) 30 mg/l; (228 h): 12 mg/l

Ecotoxicity data show that microorganisms (i.e., bacteria, algae) and zooplankton present in aquatic ecosystems are generally less tolerant of hydrogen peroxide exposure than are fish or other vertebrates.

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Effects of short-term exposures on sensitive bacteria and invertebrates (e.g., *Daphnia pulex*) have been observed at concentrations in the low mg/L (ppm) range, while effects on sensitive algae have been reported at levels less than 1.0 mg/L. Algae are the most sensitive species for hydrogen peroxide. The algal EC50 of hydrogen peroxide was 1.6-5 mg/l, while the NOEC was 0.1 mg/l. In a 21-d continuous exposure study on *Daphnia magna*, the chronic no observable effect concentration (NOEC) for reproduction was 0.63 mg/L and the NOEC for mortality was 1.25 mg/L.

In chronic toxicity studies with invertebrates (zebra mussels) and hydrogen peroxide shows an NOEC of 2 mg/l. The PNEC of hydrogen peroxide is equal to 10 ug/l -

Risk mitigation is needed to ensure that use of hydrogen peroxide will not adversely impact aquatic life. An acute water quality criterion or "benchmark" has been determined. For hydrogen peroxide, the acute benchmark is 0.7 mg/L. This value was calculated using the extensive toxicity database for hydrogen peroxide and procedures in U.S. Environmental Protection Agency guidance for deriving numerical national water quality criteria. The use of hydrogen peroxide in intensive aquaculture in finfish (at up to 100 mg/L for 60 minutes) and finfish eggs (at up to 1,000 mg/L for 15 minutes) is not expected to have a significant impact on the environment.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
acetic acid glacial	LOW		LOW	HIGH
peracetic acid	LOW	MED	LOW	HIGH
hydrogen peroxide	LOW		LOW	HIGH
water	LOW		LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

■ - 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 followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus

- 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.

- 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.

Section 14 - TRANSPORTATION INFORMATION

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Section 14 - TRANSPORTATION INFORMATION



Labels Required: OXIDIZING AGENT,CORROSIVE

HAZCHEM:

2W (ADG7)

ADG7:

Class or division:	5.1	Subsidiary risk:	8
UN No.:	3098	UN packing group:	II
Special provisions:	274	Packing Instructions:	None
Limited quantities:	1 L	Portable tanks and bulk containers - Instructions:	None
Portable tanks and bulk containers - Special provisions:	None	Packagings and IBCs - Packing instruction:	P504; IBC01
Packagings and IBCs - Special packing provisions:	None		

Shipping Name:OXIDIZING LIQUID, CORROSIVE, N.O.S. (contains peracetic acid)

Land Transport UNGD:

Class or division:	5.1	Subsidiary risk:	8
UN No.:	3098	UN packing group:	II

Shipping Name:OXIDIZING LIQUID, CORROSIVE, N.O.S. (contains peracetic acid)

Air Transport IATA:

ICAO/IATA Class:	5.1 (8)	UN/ID Number:	3098
Packing Group:	II	Special provisions:	A3

Shipping Name: OXIDIZING LIQUID, CORROSIVE, N.O.S.
*(CONTAINS PERACETIC ACID)

Maritime Transport IMDG:

IMDG Class:	5.1	IMDG Subrisk:	8
UN Number:	3098	Packing Group:	II
EMS Number:	F- A, S- Q	Special provisions:	274 944
Limited Quantities:	1 L	Marine Pollutant:	Not Determined

Shipping Name: OXIDIZING LIQUID, CORROSIVE, N.O.S.(contains peracetic acid)

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

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Section 15 - REGULATORY INFORMATION

REGULATIONS

Regulations for ingredients

acetic acid glacial (CAS: 64-19-7) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Illicit Drug Reagents/Essential Chemicals - Category III", "Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 2", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6", "CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals"

peracetic acid (CAS: 79-21-0) is found on the following regulatory lists;

"Australia - Victoria Occupational Health and Safety Regulations - Schedule 9: Materials at Major Hazard Facilities (And Their Threshold Quantity) Table 2", "Australia Dangerous Goods Code (ADG Code) - Goods Too Dangerous To Be Transported", "Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6", "International Air Transport Association (IATA) Dangerous Goods Regulations", "International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals"

hydrogen peroxide (CAS: 7722-84-1) is found on the following regulatory lists;

"Australia - Victoria Occupational Health and Safety Regulations - Schedule 9: Materials at Major Hazard Facilities (And Their Threshold Quantity) Table 2", "Australia Dangerous Goods Code (ADG Code) - Goods Too Dangerous To Be Transported", "Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Inventory of Chemical Substances (AICS)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6", "Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations", "OECD Representative List of High Production Volume (HPV) Chemicals"

water (CAS: 7732-18-5) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "IMO IBC Code Chapter 18: List of products to which the Code does not apply", "OECD Representative List of High Production Volume (HPV) Chemicals"

No data for Saraya Acecide (Reagent 1) (CW: 4695-69)

Section 16 - OTHER INFORMATION

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/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. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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This is the end of the MSDS.