

# ROWE SCIENTIFIC SODIUM SULPHIDE SOLID, HYDRATED

## ROWE SCIENTIFIC

Chemwatch Hazard Alert Code: 3

Chemwatch: 10961

Version No: 5.1.6.5

Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: 10/06/2021

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S.GHS.AUS.EN

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

#### Product Identifier

Product name	ROWE SCIENTIFIC SODIUM SULPHIDE SOLID, HYDRATED
Chemical Name	sodium sulfide, hydrated
Synonyms	CS13664, CS13666
Proper shipping name	SODIUM SULPHIDE, HYDRATED with not less than 30% water
Chemical formula	Na <sub>2</sub> S H <sub>2</sub> O.1/9Na <sub>2</sub> S
Other means of identification	Not Available
CAS number	1313-84-4

#### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Used as an analytical organic chemical; in dyes, dehairing hides, sheep dip; general chemical for gold, lead and copper ore treatment; photographic reagent; cotton printing, viscose rayon; engraving and lithography.
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#### Details of the supplier of the safety data sheet

Registered company name	ROWE SCIENTIFIC
Address	11 Challenge Boulevard Wangara WA 6065 Australia
Telephone	+61 8 9302 1911
Fax	+61 8 9302 1905
Website	<a href="https://rowe.com.au/">https://rowe.com.au/</a>
Email	rowewa@rowe.com.au

#### Emergency telephone number

Association / Organisation	ROWE SCIENTIFIC
Emergency telephone numbers	+61 8 9302 1911 (24 Hrs)
Other emergency telephone numbers	Not Available

### SECTION 2 Hazards identification

#### Classification of the substance or mixture

Poisons Schedule	S5
Classification [1]	Corrosive to Metals Category 1, Acute Toxicity (Oral) Category 4, Acute Toxicity (Dermal) Category 3, Skin Corrosion/Irritation Category 1A, Serious Eye Damage/Eye Irritation Category 1, Acute Aquatic Hazard Category 1
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

#### Label elements

Hazard pictogram(s)	
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Signal word | **Danger**

#### Hazard statement(s)

<b>H290</b>	May be corrosive to metals.
<b>H302</b>	Harmful if swallowed.
<b>H311</b>	Toxic in contact with skin.
<b>H314</b>	Causes severe skin burns and eye damage.
<b>H400</b>	Very toxic to aquatic life.
<b>AUH031</b>	Contact with acid liberates toxic gas.

#### Precautionary statement(s) Prevention

<b>P260</b>	Do not breathe dust/fume.
<b>P264</b>	Wash all exposed external body areas thoroughly after handling.
<b>P280</b>	Wear protective gloves, protective clothing, eye protection and face protection.
<b>P234</b>	Keep only in original packaging.
<b>P270</b>	Do not eat, drink or smoke when using this product.
<b>P273</b>	Avoid release to the environment.

#### Precautionary statement(s) Response

<b>P301+P330+P331</b>	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
<b>P303+P361+P353</b>	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
<b>P305+P351+P338</b>	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
<b>P310</b>	Immediately call a POISON CENTER/doctor/physician/first aider.
<b>P302+P352</b>	IF ON SKIN: Wash with plenty of water.
<b>P363</b>	Wash contaminated clothing before reuse.
<b>P361+P364</b>	Take off immediately all contaminated clothing and wash it before reuse.
<b>P390</b>	Absorb spillage to prevent material damage.
<b>P391</b>	Collect spillage.
<b>P301+P312</b>	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
<b>P304+P340</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing.

#### Precautionary statement(s) Storage

<b>P405</b>	Store locked up.
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#### Precautionary statement(s) Disposal

<b>P501</b>	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.
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### SECTION 3 Composition / information on ingredients

#### Substances

CAS No	%[weight]	Name
1313-84-4	>98	<u>sodium sulfide, hydrated</u>
Not Available		(hydrated with >30% water of crystallization)
Not Available		NOTE: Readily decomposed by heat, acids to produce
7783-06-4		<u>hydrogen sulfide</u>
Not Available		Contact with air produces
7772-98-7		<u>sodium thiosulfate</u>
497-19-8		<u>sodium carbonate</u>

**Legend:** 1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; \* EU IOELVs available

## Mixtures

See section above for composition of Substances

## SECTION 4 First aid measures

### Description of first aid measures

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <p>Immediately hold eyelids apart and flush the eye continuously with running water.</p> <p>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.</p> <p>Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.</p> <p>Transport to hospital or doctor without delay.</p> <p>Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</p>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <p>Immediately flush body and clothes with large amounts of water, using safety shower if available.</p> <p>Quickly remove all contaminated clothing, including footwear.</p> <p>Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.</p> <p>Transport to hospital, or doctor.</p>
<b>Inhalation</b>	<p>If fumes or combustion products are inhaled remove from contaminated area.</p> <p>Lay patient down. Keep warm and rested.</p> <p>Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</p> <p>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.</p> <p>Transport to hospital, or doctor, without delay.</p> <p>Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.</p> <p>Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).</p> <p>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.</p> <p>Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.</p> <p><b>This must definitely be left to a doctor or person authorised by him/her.</b> (ICSC13719)</p>
<b>Ingestion</b>	<p>For advice, contact a Poisons Information Centre or a doctor at once.</p> <p>Urgent hospital treatment is likely to be needed.</p> <p><b>If swallowed do NOT induce vomiting.</b></p> <p>If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</p> <p>Observe the patient carefully.</p> <p>Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</p> <p>Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</p> <p>Transport to hospital or doctor without delay.</p>

### Indication of any immediate medical attention and special treatment needed

For acute or short-term repeated exposures to highly alkaline materials:

Respiratory stress is uncommon but present occasionally because of soft tissue edema.

Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.

Oxygen is given as indicated.

The presence of shock suggests perforation and mandates an intravenous line and fluid administration.

Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.

#### INGESTION:

Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.

Neutralising agents should never be given since exothermic heat reaction may compound injury.

\* Catharsis and emesis are absolutely contra-indicated.

\* Activated charcoal does not absorb alkali.

\* Gastric lavage should not be used.

Supportive care involves the following:

Withhold oral feedings initially.

If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.

Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.

Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

## SKIN AND EYE:

Injury should be irrigated for 20-30 minutes.

Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

For exposures involving sulfides and hydrogen sulfide (including gastric acid decomposition products of alkaline sulfides):

Hydrogen sulfide anion produces its major toxic effect through inhibition of cytochrome oxidases.

Symptoms include profuse salivation, nausea, vomiting and diarrhea. Central nervous effects may include giddiness, headache, vertigo, amnesia, confusion and unconsciousness. Tachypnoea, palpitations, tachycardia, arrhythmia, sweating, weakness and muscle cramps may also indicate overexposure.

Treatment involves:

If respirations are depressed, application of artificial respiration, administration of oxygen (continue after spontaneous breathing is established).

For severe poisonings administer amyl nitrite and sodium nitrite (as for cyanide poisoning) but omit sodium thiosulfate injection.

Atropine sulfate (0.6 mg intramuscularly) may contribute symptomatic relief.

Conjunctivitis may be relieved by installation of 1 drop of olive-oil in each eye and sometimes by 3 drops of epinephrine solution (1:1000) at frequent intervals.

Occasionally local anesthetics and hot and cold compresses are necessary to control pain.

Antibiotics at first hint of pulmonary infection.

[Gosselin et al, Clinical Toxicology of Commercial Products]

Hydrogen sulfide is metabolised by oxidation to sulfate, methylation and reaction with metallic ion- or disulfide containing proteins (principally cytochrome c oxidase). This latter reaction is associated with aerobic, cellular respiration and is largely responsible for the toxic effects

## SECTION 5 Firefighting measures

### Extinguishing media

Water spray or fog.

Foam.

Dry chemical powder.

BCF (where regulations permit).

Carbon dioxide.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	None known.
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### Advice for firefighters

<b>Fire Fighting</b>	<p>Alert Fire Brigade and tell them location and nature of hazard.</p> <p>Wear full body protective clothing with breathing apparatus.</p> <p>Prevent, by any means available, spillage from entering drains or water course.</p> <p>Use fire fighting procedures suitable for surrounding area.</p> <p><b>Do not approach containers suspected to be hot.</b></p> <p>Cool fire exposed containers with water spray from a protected location.</p> <p>If safe to do so, remove containers from path of fire.</p> <p>Equipment should be thoroughly decontaminated after use.</p>
<b>Fire/Explosion Hazard</b>	<p>Non combustible.</p> <p>Not considered a significant fire risk, however containers may burn.</p> <p>Decomposition may produce toxic fumes of:</p> <p>hydrogen sulfide (H<sub>2</sub>S)</p> <p>metal oxides</p> <p>May emit corrosive fumes.</p> <p>Decomposes on heating to produce highly flammable and toxic hydrogen sulfide gas(H<sub>2</sub>S). (H<sub>2</sub>S has a flammable range of 4.0% to 44.0% and an autoignition temperature of 260 C.) Complete combustion gives sulfur dioxide (SO<sub>2</sub>) and sodium alkali.</p>
<b>HAZCHEM</b>	2X

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<p>Remove all ignition sources.</p> <p>Clean up all spills immediately.</p> <p>Avoid contact with skin and eyes.</p>
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	<p>Control personal contact with the substance, by using protective equipment.</p> <p>Use dry clean up procedures and avoid generating dust.</p> <p>Place in a suitable, labelled container for waste disposal.</p> <p>Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.</p> <p>Check regularly for spills and leaks.</p>
<b>Major Spills</b>	<p><b>DO NOT touch the spill material</b></p> <p>Clear area of personnel and move upwind.</p> <p>Alert Fire Brigade and tell them location and nature of hazard.</p> <p>Wear full body protective clothing with breathing apparatus.</p> <p>Prevent, by any means available, spillage from entering drains or water course.</p> <p>Consider evacuation (or protect in place).</p> <p>Stop leak if safe to do so.</p> <p>Contain spill with sand, earth or vermiculite.</p> <p>Collect recoverable product into labelled containers for recycling.</p> <p>Neutralise/decontaminate residue (see Section 13 for specific agent).</p> <p>Collect solid residues and seal in labelled drums for disposal.</p> <p>Wash area and prevent runoff into drains.</p> <p>After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.</p> <p>If contamination of drains or waterways occurs, advise emergency services.</p>

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

## SECTION 7 Handling and storage

### Precautions for safe handling

<b>Safe handling</b>	<p>Avoid all personal contact, including inhalation.</p> <p>Wear protective clothing when risk of exposure occurs.</p> <p>Use in a well-ventilated area.</p> <p><b>WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.</b></p> <p>Avoid smoking, naked lights or ignition sources.</p> <p>Avoid contact with incompatible materials.</p> <p>When handling, <b>DO NOT eat, drink or smoke.</b></p> <p>Keep containers securely sealed when not in use.</p> <p>Avoid physical damage to containers.</p> <p>Always wash hands with soap and water after handling.</p> <p>Work clothes should be laundered separately. Launder contaminated clothing before re-use.</p> <p>Use good occupational work practice.</p> <p>Observe manufacturer's storage and handling recommendations contained within this SDS.</p> <p>Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</p>
<b>Other information</b>	<p>Store in original containers.</p> <p>Keep containers securely sealed.</p> <p>Store in a cool, dry, well-ventilated area.</p> <p>Store away from incompatible materials and foodstuff containers.</p> <p>Protect containers against physical damage and check regularly for leaks.</p> <p>Observe manufacturer's storage and handling recommendations contained within this SDS.</p> <p><b>DO NOT store near acids, or oxidising agents</b></p> <p>No smoking, naked lights, heat or ignition sources.</p>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<p><b>DO NOT use aluminium, galvanised or tin-plated containers</b></p> <p>Lined metal can, lined metal pail/ can.</p> <p>Plastic pail.</p> <p>Polyliner drum.</p> <p>Packing as recommended by manufacturer.</p> <p>Check all containers are clearly labelled and free from leaks.</p> <p>For low viscosity materials</p> <p>Drums and jerricans must be of the non-removable head type.</p> <p>Where a can is to be used as an inner package, the can must have a screwed enclosure.</p> <p>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):</p> <p>Removable head packaging;</p> <p>Cans with friction closures and</p> <p>low pressure tubes and cartridges</p> <p>may be used.</p> <p>-</p>
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Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

### Storage incompatibility

Sodium sulfide:  
 when anhydrous, ignites spontaneously in air  
 is sensitive to rapidly elevated temperatures; heating above 920 deg. C. or friction can cause explosive decomposition forming sodium oxide and sulfur dioxide  
 reacts with acids forming hydrogen sulfide  
 reacts violently with carbon, N,N-dichloromethylamine, o-nitroaniline, acids, aluminium powder, copper, zinc, oxidisers, diazonium salts, dichloromethylamine  
 once moist, can self-ignite upon drying in air  
 reacts with water forming a strong base  
 aqueous solutions are incompatible with organic anhydrides, acrylates, alcohols, aldehydes, alkylene oxides, substituted allyls, m-chlorobenzenediazonium salts, cresols, caprolactam solution, epichlorohydrin, ethylene dichloride, isocyanates, ketones, glycols, nitrates, phenols, vinyl acetate  
 attacks light metals, aluminium, steel

Hydrogen sulfide (H<sub>2</sub>S):  
 is a highly flammable and reactive gas  
 reacts violently with strong oxidisers, metal oxides, metal dusts and powders, bromine pentafluoride, chlorine trifluoride, chromium trioxide, chromyl chloride, dichlorine oxide, nitrogen trichloride, nitryl hypofluorite, oxygen difluoride, perchloryl fluoride, phospham, phosphorus persulfide, silver fulminate, soda-lime, sodium peroxide  
 is incompatible with acetaldehyde, chlorine monoxide, chromic acid, chromic anhydride, copper, nitric acid, phenyldiazonium chloride, sodium  
 forms explosive material with benzenediazonium salts  
 attacks many metals

Flow or agitation of hydrogen sulfide may generate electrostatic charges due to low conductivity

Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.  
 These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.  
 The state of subdivision may affect the results.  
 Sulfides are incompatible with acids, diazo and azo compounds, halocarbons, isocyanates, aldehydes, alkali metals, nitrides, hydrides, and other strong reducing agents.  
 Many reactions of sulfides with these materials generate heat and in many cases hydrogen gas.  
 Many sulfide compounds may liberate hydrogen sulfide upon reaction with an acid.  
 Avoid contact with copper, aluminium and their alloys.  
 Reacts slowly with moisture to give off toxic, flammable hydrogen sulfide.



X — Must not be stored together  
 0 — May be stored together with specific preventions  
 + — May be stored together

Note: Depending on other risk factors, compatibility assessment based on the table above may not be relevant to storage situations, particularly where large volumes of dangerous goods are stored and handled. Reference should be made to the Safety Data Sheets for each substance or article and risks assessed accordingly.

## SECTION 8 Exposure controls / personal protection

### Control parameters

#### Occupational Exposure Limits (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	hydrogen sulfide	Hydrogen sulphide	10 ppm / 14 mg/m <sup>3</sup>	21 mg/m <sup>3</sup> / 15 ppm	Not Available	Not Available

#### Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
sodium sulfide, hydrated	0.62 mg/m <sup>3</sup>	6.9 mg/m <sup>3</sup>	41 mg/m <sup>3</sup>
sodium sulfide, hydrated	0.17 mg/m <sup>3</sup>	1.9 mg/m <sup>3</sup>	11 mg/m <sup>3</sup>

Ingredient	TEEL-1	TEEL-2	TEEL-3
hydrogen sulfide	Not Available	Not Available	Not Available
sodium thiosulfate	50 mg/m <sup>3</sup>	550 mg/m <sup>3</sup>	3,300 mg/m <sup>3</sup>
sodium thiosulfate	38 mg/m <sup>3</sup>	410 mg/m <sup>3</sup>	2,500 mg/m <sup>3</sup>
sodium carbonate	7.6 mg/m <sup>3</sup>	83 mg/m <sup>3</sup>	500 mg/m <sup>3</sup>


Ingredient	Original IDLH	Revised IDLH
sodium sulfide, hydrated	Not Available	Not Available
hydrogen sulfide	100 ppm	Not Available
sodium thiosulfate	Not Available	Not Available
sodium carbonate	Not Available	Not Available

### Occupational Exposure Banding

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
sodium sulfide, hydrated	E	≤ 0.01 mg/m <sup>3</sup>
sodium thiosulfate	E	≤ 0.01 mg/m <sup>3</sup>
sodium carbonate	E	≤ 0.01 mg/m <sup>3</sup>
<b>Notes:</b>	<i>Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.</i>	

### Exposure controls

Appropriate engineering controls	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure.  Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.										
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	<p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>
<p><b>Personal protection</b></p>	
<p><b>Eye and face protection</b></p>	<p>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.</p> <p>Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.</p> <p>Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.</p> <p>Alternatively a gas mask may replace splash goggles and face shields.</p> <p>Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses 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], [AS/NZS 1336 or national equivalent]</p>
<p><b>Skin protection</b></p>	<p>See Hand protection below</p>
<p><b>Hands/feet protection</b></p>	<p>Elbow length PVC gloves</p> <p><b>NOTE:</b></p> <p>The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.</p> <p>Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.</p> <p>The selection of 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.</p> <p>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.</p> <p>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.</p> <p>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:</p> <ul style="list-style-type: none"> <li>· frequency and duration of contact,</li> <li>· chemical resistance of glove material,</li> <li>· glove thickness and</li> <li>· dexterity</li> </ul> <p>Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).</p> <ul style="list-style-type: none"> <li>· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.</li> <li>· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.</li> <li>· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.</li> <li>· Contaminated gloves should be replaced.</li> </ul> <p>As defined in ASTM F-739-96 in any application, gloves are rated as:</p> <ul style="list-style-type: none"> <li>· Excellent when breakthrough time &gt; 480 min</li> <li>· Good when breakthrough time &gt; 20 min</li> <li>· Fair when breakthrough time &lt; 20 min</li> <li>· Poor when glove material degrades</li> </ul> <p>For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.</p> <p>It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.</p> <p>Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.</p> <p>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:</p> <ul style="list-style-type: none"> <li>· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.</li> <li>· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential</li> </ul>

	Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	Overalls. PVC Apron. PVC protective suit may be required if exposure severe. Eyewash unit. Ensure there is ready access to a safety shower.

## Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	- -	PAPR-P1 -
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3	-
		Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

\* - Negative pressure demand \*\* - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

For concentrations exceeding 10 ppm hydrogen sulfide or for unknown concentrations:

Respirators should be equipped with pressure demand regulators and operated in pressure demand mode only. If airline units are used, a 5-minute egress bottle must also be carried.

Gas masks or other air-purifying respirators must never be used for H<sub>2</sub>S, due to the poor warning properties of the gas.

When exposure concentrations are unknown and respiratory protection is not used, personal H<sub>2</sub>S warning devices should be worn.

These devices should not be relied on to warn of life-threatening concentrations.

H<sub>2</sub>S rapidly fatigues the sense of smell; the rotten egg odour disappears quickly even where high concentrations are present.

## SECTION 9 Physical and chemical properties

### Information on basic physical and chemical properties

<b>Appearance</b>	White to pink flakes; slight hydrogen sulfide (rotten egg) odour. Has greater than 30 % water of crystallisation, comprise principally the trihydrate, but also the pentahydrate and nonahydrate. Higher hydrates discolour on exposure to light and air; changing from yellow brown to brownish black. Higher hydrates melt readily as they are essentially solid solutions. Solid sodium sulfide in contact with air exothermically oxidises to sodium carbonate, sodium thiosulfate and hydrogen sulfide. Releases low levels of hydrogen sulfide (H <sub>2</sub> S) at room temperature. Mildly corrosive to most metals. REACTIVE: mixing with acids etc. results in rapid release of toxic and flammable H <sub>2</sub> S gas.		
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<b>Physical state</b>	Divided Solid	<b>Relative density (Water = 1)</b>	1.43(9H <sub>2</sub> O) 1.7
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Available
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition</b>	Not Available

		<b>temperature</b>	
<b>Melting point / freezing point (°C)</b>	apprx 50-90	<b>Viscosity (cSt)</b>	Not Applicable
<b>Initial boiling point and boiling range (°C)</b>	Not Applicable	<b>Molecular weight (g/mol)</b>	132.08 (3H <sub>2</sub> O)
<b>Flash point (°C)</b>	Not Applicable	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Applicable	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	45.0 (H <sub>2</sub> S)	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Applicable
<b>Lower Explosive Limit (%)</b>	4.3 (H <sub>2</sub> S)	<b>Volatile Component (%vol)</b>	Not Applicable
<b>Vapour pressure (kPa)</b>	100 @ 145-175 C	<b>Gas group</b>	Not Available
<b>Solubility in water</b>	Miscible	<b>pH as a solution (%)</b>	13
<b>Vapour density (Air = 1)</b>	Not Applicable	<b>VOC g/L</b>	Not Available

## SECTION 10 Stability and reactivity

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

## SECTION 11 Toxicological information

### Information on toxicological effects

<b>Inhaled</b>	<p>The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.</p> <p>Inhaling corrosive bases may irritate the respiratory tract. Symptoms include cough, choking, pain and damage to the mucous membrane.</p> <p>Inhalation of vapours, aerosols (mists, fumes) or dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.</p> <p>Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p> <p>Hydrogen sulfide poisoning can cause increased secretion of saliva, nausea, vomiting, diarrhoea, giddiness, headache, vertigo, memory loss, palpitations, heartbeat irregularities, weakness, muscle cramps, confusion, sudden collapse, unconsciousness and death due to paralysis of breathing (at levels above 300 parts per million). The "rotten egg" odour is not a good indicator of exposure since odour fatigue occurs and odour is lost at over 200 ppm.</p>
<b>Ingestion</b>	<p>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.</p> <p>Ingestion of alkaline corrosives may produce burns around the mouth, ulcerations and swellings of the mucous membranes, profuse saliva production, with an inability to speak or swallow. Both the oesophagus and stomach may experience burning pain; vomiting and diarrhoea may follow.</p> <p>If ingested, sulfide salts can form hydrogen sulfide, causing headache, cyanosis, low blood pressure, loss of consciousness, tremors and convulsions.</p>
<b>Skin Contact</b>	<p>Skin contact with the material may produce toxic effects; systemic effects may result following absorption.</p> <p>The material can produce severe chemical burns following direct contact with the skin.</p> <p>Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>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.</p>

<b>Eye</b>	<p>If applied to the eyes, this material causes severe eye damage.</p> <p>Direct eye contact with corrosive bases can cause pain and burns. There may be swelling, epithelium destruction, clouding of the cornea and inflammation of the iris. Mild cases often resolve; severe cases can be prolonged with complications such as persistent swelling, scarring, permanent cloudiness, bulging of the eye, cataracts, eyelids glued to the eyeball and blindness. Exposure to H<sub>2</sub>S may produce pain, blurred vision, and reaction to eyes which may be permanent in severe cases. There is usually redness of the eyes, discomfort on exposure to light, pain, and at higher concentrations blurred vision and injury to the eyes.</p>
<b>Chronic</b>	<p>Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems.</p> <p>Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.</p> <p>There is limited evidence that, skin contact with this product is more likely to cause a sensitisation reaction in some persons compared to the general population.</p> <p>Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis, caused by particles less than 0.5 micron penetrating and remaining in the lung.</p> <p>Long term low level exposure to hydrogen sulfide may produce headache, fatigue, dizziness, irritability and loss of sexual desire. These symptoms may also result when exposed to hydrogen sulfide at high concentration for a short period of time.</p>

<b>sodium sulfide, hydrated</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Oral(Rat) LD50; 208 mg/kg <sup>[2]</sup>	Not Available
<b>hydrogen sulfide</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Inhalation(Mouse) LC50; 316.028 ppm4h <sup>[2]</sup>	Not Available
<b>sodium thiosulfate</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	Dermal (rabbit) LD50; >2000 mg/kg <sup>[1]</sup>	Not Available
	Inhalation(Rat) LC50; >2.6 mg/l4h <sup>[1]</sup>	
<b>sodium carbonate</b>	<b>TOXICITY</b>	<b>IRRITATION</b>
	dermal (mouse) LD50: 117 mg/kg <sup>[2]</sup>	Eye (rabbit): 100 mg/24h moderate
	Oral(Rat) LD50; 2800 mg/kg <sup>[1]</sup>	Eye (rabbit): 100 mg/30s mild
		Eye (rabbit): 50 mg SEVERE
		Eye: adverse effect observed (irritating) <sup>[1]</sup>
	Skin (rabbit): 500 mg/24h mild	
	Skin: no adverse effect observed (not irritating) <sup>[1]</sup>	
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>SODIUM SULFIDE, HYDRATED</b>	<p>The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p> <p>The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.</p> <p>* anhydrous form</p>
<b>SODIUM CARBONATE</b>	<p>For sodium carbonate:</p> <p>Sodium carbonate has little potential for skin irritation, but is irritating to the eyes. Due to its alkaline properties, irritation of the airways is also possible.</p> <p>There is no data available for animal studies regarding the repeated dose toxicity of sodium carbonate by any route. There is no evidence that sodium carbonate causes whole-body effects under normal handling and use. Sodium carbonate does not reach the foetus or the reproductive organs, which shows that there is no risk for developmental or reproductive toxicity. Sodium carbonate has not been shown to cause genetic toxicity or mutations.</p>
<b>SODIUM SULFIDE, HYDRATED &amp; SODIUM THIOSULFATE &amp; SODIUM CARBONATE</b>	<p>Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of</p>

	and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.
<b>SODIUM SULFIDE, HYDRATED &amp; SODIUM CARBONATE</b>	The material may cause 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.

<b>Acute Toxicity</b>		<b>Carcinogenicity</b>	
<b>Skin Irritation/Corrosion</b>		<b>Reproductivity</b>	
<b>Serious Eye Damage/Irritation</b>		<b>STOT - Single Exposure</b>	
<b>Respiratory or Skin sensitisation</b>		<b>STOT - Repeated Exposure</b>	
<b>Mutagenicity</b>		<b>Aspiration Hazard</b>	

**Legend:** – Data either not available or does not fill the criteria for classification  
– Data available to make classification

## SECTION 12 Ecological information

### Toxicity

	Endpoint	Test Duration (hr)	Species	Value	Source
<b>sodium sulfide, hydrated</b>	LC50	96h	Fish	0.002-0.63mg/l	2
	EC50	48h	Crustacea	2.1mg/l	1
	NOEC(ECx)	528h	Fish	<0.001mg/l	2
	EC50	96h	Algae or other aquatic plants	<75mg/l	1
<b>hydrogen sulfide</b>	NOEC(ECx)	3960h	Fish	<0.001mg/L	5
	LC50	96h	Fish	<0.007mg/l	2
	EC50	48h	Crustacea	0.12mg/l	2
<b>sodium thiosulfate</b>	NOEC(ECx)	504h	Crustacea	>10mg/l	2
	EC50	72h	Algae or other aquatic plants	>100mg/l	2
	LC50	96h	Fish	40800mg/L	4
	EC50	48h	Crustacea	230mg/l	2
<b>sodium carbonate</b>	NOEC(ECx)	Not Available	Algae or other aquatic plants	1-10mg/l	2
	LC50	96h	Fish	300mg/l	2
	EC50	48h	Crustacea	156.6-298.9mg/l	4
<b>Legend:</b>	<i>Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data</i>				

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.

for sodium sulfide:

#### Environmental fate:

Sodium sulfide is predicted to have high mobility in soil, to be substantially biodegradable in water and substantially removed in biological treatment processes.

#### Ecotoxicity:

Fish LC50: *Leuciscus idus* 25 mg/l

*Daphnia magna* EC50: 7.1 mg/l

Algal EC50: *M. aeruginosa* 8 mg/l  
 Protozoa EC50: *E. sulcatum* 14 mg/l

Sulfide ion is very toxic to aquatic life, threshold concentration for fresh or saltwater fish is 0.5ppm. The product therefore is very toxic to aquatic life. The major decomposition product, hydrogen sulfide, is damaging to vegetation at 5ppm for 24 hours

For hydrogen sulfide:

**Environmental Fate:** Since hydrogen sulfide exists as a gas at atmospheric pressure, partitioning to the air is likely to occur after environmental release, where it may adhere to soil and plant foliage. The compound is also soluble in oil and water, and thus may also partition to surface water, groundwater, or moist soil.

Hydrogen sulfide's solubility in pure water decreases as water temperature increases. Once hydrogen sulfide is dissolved in water, it will dissociate into bisulfide and sulfide ions; the ratio and concentrations of these ions will depend on the pH of the solution. Hydrogen sulfide can also form insoluble sulfide salts with various metals (i.e., copper, zinc, nickel, and iron) that may be present in soils or environmental waters. Hydrogen sulfide evaporates easily from water, and the rate of evaporation depends on factors such as temperature, humidity, pKa, pH, and the concentration of certain metal ions. The rate of gaseous exchange of hydrogen sulfide across the air-water interface is similar to other unreactive gases, such as oxygen (O<sub>2</sub>), nitrogen (N<sub>2</sub>), and carbon dioxide (CO<sub>2</sub>), at pHs <=6. At higher pHs, such as seawater (pH >=8), hydrogen sulfide escape increases due to an ionic species gradient in the surface waters. Complexation of bisulfide and sulfide ions to trace metal ions (i.e., Zn<sup>2+</sup>, Co<sup>2+</sup>, and Ni<sup>2+</sup>) found in seawater also affects the transport of hydrogen sulfide across the air-water interface. Hydrogen sulfide may adhere to clay or organic matter. Under natural conditions, it is likely that some hydrogen sulfide would be oxidized to sulfate, which may be removed by leaching or taken up by plants, offering the potential for ongoing gas sorption. Several species of soil, aquatic, and marine microorganisms oxidize hydrogen sulfide to elemental sulfur, and its half-time in these environments usually ranges from 1 hour to several hours. Food chain bioconcentration and biomagnification are unlikely. In the atmosphere, hydrogen sulfide may be oxidized by oxygen (O<sub>2</sub>) and ozone (O<sub>3</sub>) to give sulfur dioxide (SO<sub>2</sub>), and ultimately sulfate compounds, however this is not considered to be a significant environmental fate, nor is it expected to be decomposed by direct absorption of ultraviolet radiation. Sulfur dioxide and sulfates are eventually removed from the atmosphere through absorption by plants, deposition on and sorption by soils, or through precipitation. Life-times of hydrogen sulfide in air are significantly longer in winter. In aqueous solution, hydrogen sulfide is a weak acid, which dissociates into bisulfide and sulfide ions with pKa values of 7.04 and 11.96 respectively. At a pH of 7.0, the ratio of the concentration of hydrogen sulfide to bisulfate ions is approximately equal, but increases as the pH increases, with the relative concentration of bisulfide becoming significant (>50%) above pH 12. Hydrogen sulfide oxidation readily occurs in surface waters due to mixing with O<sub>2</sub> across the air-water interface. At 25 °C and pH 8, half-times of 50 and 26 hours were reported for hydrogen sulfide in water and seawater, respectively. Above pH 8, however, the rate of oxidation was independent of pH. The toxicity of hydrogen sulfide in waste water may be reduced by adding oxidizing chemicals, which break it down to less toxic by-products. In warm, damp environments (such as manholes and gravity sewers), hydrogen sulfide may be oxidized by autotrophic bacteria to sulfuric acid. Hydrogen sulfide is a principal component in the natural sulfur cycle, and is naturally released by bacteria, fungi, and actinomycetes (a fungus-like bacteria) during the decomposition proteins containing sulfur and when directly reducing sulfate. Hydrogen sulfide is also oxidized by bacteria in soil and water and reduced to sulfur. Photosynthetic bacteria can oxidize hydrogen sulfide to sulfur and sulfate in the presence of light and the absence of oxygen. Hydrogen sulfide is broken down to sulfur or sulfate by a number of microorganisms, including heterotrophic bacterium of the genus *Xanthomonas*, heterotrophic fungi, and a marine isopod. Soils may sorb considerable amounts of hydrogen sulfide from the air, whereupon manganese compounds in the soil appear to catalyze the oxidation of hydrogen sulfide to elemental sulfur.

Ecotoxicity: Fish LC50 (96 h): 075->0.4 mg/l

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

**DO NOT discharge into sewer or waterways.**

### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
sodium sulfide, hydrated	HIGH	HIGH
hydrogen sulfide	LOW	LOW
sodium thiosulfate	HIGH	HIGH
sodium carbonate	LOW	LOW

### Bioaccumulative potential

Ingredient	Bioaccumulation
sodium sulfide, hydrated	LOW (BCF = 10.9)
hydrogen sulfide	LOW (LogKOW = 0.229)
sodium thiosulfate	LOW (LogKOW = -1.529)
sodium carbonate	LOW (LogKOW = -0.4605)

### Mobility in soil

Ingredient	Mobility
sodium sulfide, hydrated	LOW (KOC = 14.3)
hydrogen sulfide	LOW (KOC = 14.3)
sodium thiosulfate	LOW (KOC = 6.124)
sodium carbonate	HIGH (KOC = 1)



## SECTION 13 Disposal considerations

## Waste treatment methods

<b>Product / Packaging disposal</b>	<p>Containers may still present a chemical hazard/ danger when empty. Return to supplier for reuse/ recycling if possible.</p> <p>Otherwise:</p> <p>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 SDS and observe all notices pertaining to the product.</p> <p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> <li>Reduction</li> <li>Reuse</li> <li>Recycling</li> <li>Disposal (if all else fails)</li> </ul> <p>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.</p> <p><b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></p> <p>It may be necessary to collect all wash water for treatment before disposal.</p> <p>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</p> <p>Where in doubt contact the responsible authority.</p> <p>Recycle wherever possible.</p> <p>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.</p> <p>Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurring in water; Neutralisation followed by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material)</p> <p>Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.</p>
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## SECTION 14 Transport information

### Labels Required

	
<b>Marine Pollutant</b>	
<b>HAZCHEM</b>	2X

### Land transport (ADG)

<b>UN number</b>	1849	
<b>UN proper shipping name</b>	SODIUM SULPHIDE, HYDRATED with not less than 30% water	
<b>Transport hazard class(es)</b>	Class	8
	Subrisk	Not Applicable
<b>Packing group</b>	II	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Limited quantity	1 kg

### Air transport (ICAO-IATA / DGR)

<b>UN number</b>	1849	
<b>UN proper shipping name</b>	Sodium sulphide, hydrated with 30% or more water	
<b>Transport hazard class(es)</b>	ICAO/IATA Class	8
	ICAO / IATA Subrisk	Not Applicable

	ERG Code	8L
<b>Packing group</b>	II	
<b>Environmental hazard</b>	Environmentally hazardous	
<b>Special precautions for user</b>	Special provisions	Not Applicable
	Cargo Only Packing Instructions	863
	Cargo Only Maximum Qty / Pack	50 kg
	Passenger and Cargo Packing Instructions	859
	Passenger and Cargo Maximum Qty / Pack	15 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Y844
	Passenger and Cargo Limited Maximum Qty / Pack	5 kg

#### Sea transport (IMDG-Code / GGVSee)

<b>UN number</b>	1849	
<b>UN proper shipping name</b>	SODIUM SULPHIDE, HYDRATED with not less than 30% water	
<b>Transport hazard class(es)</b>	IMDG Class	8
	IMDG Subrisk	Not Applicable
<b>Packing group</b>	II	
<b>Environmental hazard</b>	Marine Pollutant	
<b>Special precautions for user</b>	EMS Number	F-A , S-B
	Special provisions	Not Applicable
	Limited Quantities	1 kg

#### Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

#### Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
sodium sulfide, hydrated	Not Available
hydrogen sulfide	Not Available
sodium thiosulfate	Not Available
sodium carbonate	Not Available

#### Transport in bulk in accordance with the ICG Code

Product name	Ship Type
sodium sulfide, hydrated	Not Available
hydrogen sulfide	Not Available
sodium thiosulfate	Not Available
sodium carbonate	Not Available

## SECTION 15 Regulatory information

### Safety, health and environmental regulations / legislation specific for the substance or mixture

#### sodium sulfide, hydrated is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australian Inventory of Industrial Chemicals (AIIC)

#### hydrogen sulfide is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 7

Australian Inventory of Industrial Chemicals (AIIC)

#### sodium thiosulfate is found on the following regulatory lists

Australian Inventory of Industrial Chemicals (AIIC)

#### sodium carbonate is found on the following regulatory lists

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 10 / Appendix C

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5

Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6

Australian Inventory of Industrial Chemicals (AIIC)

## National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (sodium sulfide, hydrated; hydrogen sulfide; sodium thiosulfate; sodium carbonate)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	Yes
Japan - ENCS	Yes
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	Yes
Vietnam - NCI	Yes
Russia - FBEPH	Yes
<b>Legend:</b>	<i>Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)</i>

## SECTION 16 Other information

### Other information

#### Ingredients with multiple cas numbers

Name	CAS No
sodium sulfide, hydrated	1313-84-4, 1313-83-3, 27610-45-3, 42607-30-7
sodium thiosulfate	7772-98-7, 10102-17-7
sodium carbonate	497-19-8, 7542-12-3, 1314087-39-2, 1332-57-6, 1977561-09-3

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.

The 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.

### Definitions and abbreviations

PC - TWA: Permissible Concentration-Time Weighted Average

PC - STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit,  
IDLH: Immediately Dangerous to Life or Health Concentrations  
ES: Exposure Standard  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index  
AIIIC: Australian Inventory of Industrial Chemicals  
DSL: Domestic Substances List  
NDSL: Non-Domestic Substances List  
IECSC: Inventory of Existing Chemical Substance in China  
EINECS: European INventory of Existing Commercial chemical Substances  
ELINCS: European List of Notified Chemical Substances  
NLP: No-Longer Polymers  
ENCS: Existing and New Chemical Substances Inventory  
KECI: Korea Existing Chemicals Inventory  
NZIoC: New Zealand Inventory of Chemicals  
PICCS: Philippine Inventory of Chemicals and Chemical Substances  
TSCA: Toxic Substances Control Act  
TCSI: Taiwan Chemical Substance Inventory  
INSQ: Inventario Nacional de Sustancias Químicas  
NCI: National Chemical Inventory  
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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