

CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 1 of 13

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

CALCIUM HYDRIDE

OTHER NAMES

CaH₂

PROPER SHIPPING NAME

CALCIUM HYDRIDE

PRODUCT USE

To prepare rare metals by reduction of their oxides; as a drying agent for liquids and gases; to generate hydrogen; 1 gm of calcium hydride in water liberates 1 litre of hydrogen at standard condition.

Used also in organic syntheses.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

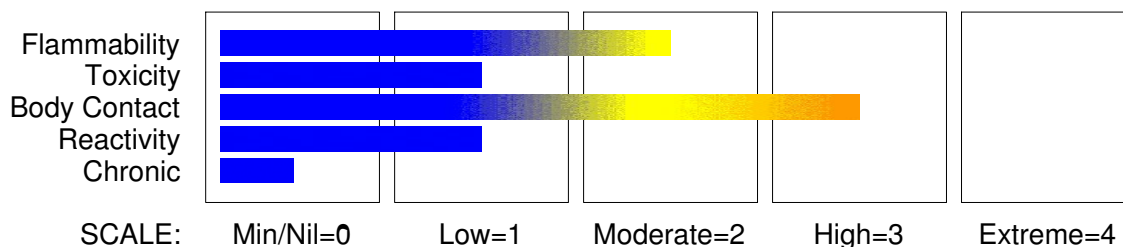
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

HAZARD RATINGS



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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 2 of 13

Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Emit Flammable Gases with Water Category 1

Eye Irritation Category 2A

Skin Corrosion/Irritation Category 3



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H260 H316 H319

In contact with water releases flammable gases which may ignite spontaneously

Causes mild skin irritation

Causes serious eye irritation

PRECAUTIONARY STATEMENTS

Prevention

Wash hands thoroughly after handling.

Handle under inert gas, protect from moisture.

Keep from any possible contact with water, because of violent reaction and possible flash fire.

Response

Wear eye/face protection.

If eye irritation persists, get medical advice/attention.

If skin irritation occurs, seek medical advice/attention.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

Store in a dry place and/or in a closed container

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
calcium hydride	7789-78-8	>98
Reaction with water or moist air generates		
hydrogen	1333-74-0	
calcium hydroxide	1305-62-0	

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CALCIUM HYDRIDE

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

- 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.
- Seek medical advice.

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 contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear passage of breathing.
- If irritation or discomfort persists seek medical attention.
- 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.

NOTES TO PHYSICIAN

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

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 4 of 13

Section 4 - FIRST AID MEASURES

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].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Dry agent.

Dry chemical powder.

Dry sand.

FIRE FIGHTING

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

- May be violently or explosively reactive.

- Wear breathing apparatus plus protective gloves.

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

DO NOT use water or halogens on dust fires.

DO NOT approach containers suspected to be hot.

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

Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

Flammable solid.

Solid in contact with water or moisture may generate sufficient heat to ignite combustible materials.

Moderate dust explosion hazard, when exposed to flame.

Contact with water liberates highly flammable gases.

Reacts vigorously with acids.

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

Decomposition products are combustible.

WARNING: Decomposition may occur after prolonged storage.

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 5 of 13

Section 5 - FIRE FIGHTING MEASURES

FIRE INCOMPATIBILITY

Segregate from alcohol, water.

Personal Protective Equipment

Gloves, boots (chemical resistant).

Breathing apparatus.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS

Clear area of personnel and move upwind.

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

Wear protective clothing, gloves, safety glasses and dust respirator.

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

No smoking, naked lights or ignition sources.

Increase ventilation.

Stop leak if safe to do so.

Use dry clean up procedures and avoid generating dust.

Use only spark-free shovels and explosion proof equipment.

Collect recoverable product into labelled containers for recycling.

Collect residues and seal in labelled drums for disposal.

Wash area down with large quantity of water and prevent runoff into drains.

After clean up operations, decontaminate and launder all protective clothing and

equipment before storing and re-using., 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:

calcium hydride 75 mg/m³

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

calcium hydride 15 mg/m³

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

calcium hydride 9 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:

calcium hydride 3 mg/m³

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 6 of 13

Section 6 - ACCIDENTAL RELEASE MEASURES

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+ X X X X +

+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

Remove all ignition sources.

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

SUITABLE CONTAINER

Container must be air-tight.

- Check that containers are clearly labelled.
- Packaging as recommended by manufacturer.

STORAGE INCOMPATIBILITY

Avoid strong acids, bases.

Segregate from alcohol, water.

Avoid contact with air.

Avoid reaction with fluorine.

STORAGE REQUIREMENTS

- Keep dry.
- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 7 of 13

Section 7 - HANDLING AND STORAGE

- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials.
- Protect containers against physical damage.
- Check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- hydrogen:

CAS:1333- 74- 0

MATERIAL DATA

These "dusts" have little adverse effect on the lungs and do not produce toxic effects or organic disease. Although there is no dust which does not evoke some cellular response at sufficiently high concentrations, the cellular response caused by P.N.O.C.s has the following characteristics:

- the architecture of the air spaces remain intact,
- scar tissue (collagen) is not synthesised to any degree,
- tissue reaction is potentially reversible.

Extensive concentrations of P.N.O.C.s may:

- seriously reduce visibility,
- cause unpleasant deposits in the eyes, ears and nasal passages,
- contribute to skin or mucous membrane injury by chemical or mechanical action, per se, or by the rigorous skin cleansing procedures necessary for their removal. [ACGIH]

This limit does not apply:

- to brief exposures to higher concentrations
- nor does it apply to those substances that may cause physiological impairment at lower concentrations but for which a TLV has as yet to be determined.

This exposure standard applies to particles which

- are insoluble or poorly soluble* in water or, preferably, in aqueous lung fluid (if data is available) and
- have a low toxicity (i.e.. are not cytotoxic, genotoxic, or otherwise chemically reactive with lung tissue, and do not emit ionizing radiation, cause immune sensitization, or cause toxic effects other than by inflammation or by a mechanism of lung overload).

INGREDIENT DATA

HYDROGEN:

ES TWA: simple asphyxiant

TLV TWA: simple asphyxiant

Simple asphyxiants are gases which, when present in high concentrations, reduce the oxygen content in air below that required to support breathing, consciousness and life; loss of consciousness, with death by suffocation may rapidly occur in an oxygen deficient atmosphere.

CARE: Most simple asphyxiants are odourless and there is no warning on entry into an oxygen deficient atmosphere. If there is any doubt, oxygen content can be checked simply and quickly. It may not be appropriate to only recommend an exposure standard for simple asphyxiants rather it is essential that sufficient oxygen be maintained. Air normally has 21 percent oxygen by volume, with 18 percent regarded as minimum under normal atmospheric pressure to maintain consciousness / life. At pressures significantly higher or lower than normal atmospheric pressure, expert guidance should be sought.

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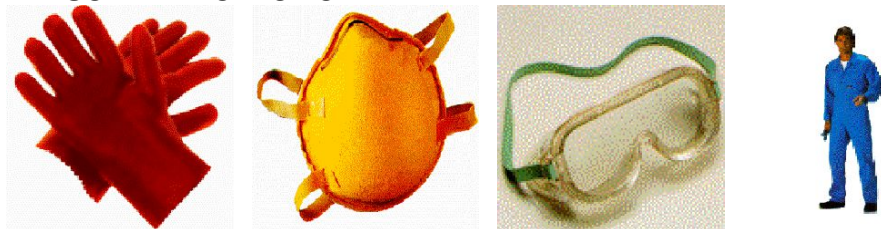
CALCIUM HYDRIDE

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

CALCIUM HYDROXIDE:

In the absence of reports of adverse effects from exposure and the recognised lesser alkalinity of the alkaline earths compared with the alkali hydroxides the relatively high value of TLV-TWA is recommended. This value corresponds in total alkalinity to 5 mg/m³ of sodium hydroxide or 2.5 times the TLV-TWA of sodium hydroxide.

PERSONAL PROTECTION



EYE

- Safety glasses with side shields
- Chemical goggles.
- 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

Wear chemical protective gloves, eg. PVC.
Wear safety footwear.

OTHER

- Overalls.
- Eyewash unit.

RESPIRATOR

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

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult your Occupational Health and Safety Advisor.

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CALCIUM HYDRIDE

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

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

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air)	0.25- 0.5 m/s (50- 100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood - local control only

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.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Grey orthorhombic crystals or powder; reacts with water to generate hydrogen.

CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 10 of 13

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Alkaline.

Molecular Weight: 42.1
Melting Range (°C): Not available
Solubility in water (g/L): Reacts
pH (1% solution): Not applicable
Volatile Component (%vol): Not available
Relative Vapour Density (air=1): Not available
Lower Explosive Limit (%): Not available
Autoignition Temp (°C): Not available
State: Divided solid

Boiling Range (°C): Not applicable
Specific Gravity (water=1): 1.7
pH (as supplied): Not applicable
Vapour Pressure (kPa): Not available
Evaporation Rate: Not available
Flash Point (°C): Not available
Upper Explosive Limit (%): Not available
Decomposition Temp (°C): Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

Considered an unlikely route of entry in commercial/industrial environments.

EYE

Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.

Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

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

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 11 of 13

Section 11 - TOXICOLOGICAL INFORMATION

SKIN

Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.

Solution of material in moisture on the skin, or perspiration, may increase irritant effects.

The material may accentuate any pre-existing skin condition.

The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

INHALED

The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

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.

CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.

As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

TOXICITY AND IRRITATION

No significant acute toxicological data identified in literature search.

HYDROGEN:

No significant acute toxicological data identified in literature search.

CALCIUM HYDROXIDE:

TOXICITY

Oral (rat) LD50: 7340 mg/kg

IRRITATION

Eye (rabbit): 10 mg - SEVERE

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 12 of 13

Section 12 - ECOLOGICAL INFORMATION

No data for calcium hydride.
Refer to data for ingredients, which follows:

HYDROGEN:

ThOD: 3.73

CALCIUM HYDROXIDE:

Fish LC50 (96hr.) (mg/l): 160

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

WASTE DISPOSAL PROCEDURES

• Collect and package recoverable quantities of calcium hydride and place in separate labelled containers for recycling and disposal. Wear protective clothing, nitrile rubber gloves and eye protection to control personal contact. Work in a well ventilated area and place the hydride in a three necked flask. With a moderate flow of nitrogen passing, dropwise add methanol (25mL for each 1 g of hydride). Add water to the slurry of calcium methoxide once all reactions have ceased. Wash the contents of the solution into the drain [Armour 1996].

SPILLAGE DISPOSAL

• Wear rubber gloves, eye protection and protective clothing to control personal contact. Cover the calcium hydride spill with a 1:1:1 mixture by weight of sodium carbonate or calcium carbonate, calcium bentonite and sand. Collect the mixture in a container and place in a well ventilated area. Add the contents of the mixture to a beaker of dry butanol or methanol. Once all reactions have ceased, drain the liquid into a container of cold water. Discard the contents into the drain. Dispose of the solid with normal refuse [Armour 1996].

Section 14 - TRANSPORTATION INFORMATION



Labels Required: DANGEROUS WHEN WET
HAZCHEM: 4Y

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CALCIUM HYDRIDE

GHS Safety Data Sheet

Version No:2.0

Page 13 of 13

Section 14 - TRANSPORTATION INFORMATION

UNDG:

Dangerous Goods Class: 4.3
UN Number: 1404
Shipping Name: CALCIUM HYDRIDE

Subrisk: None
Packing Group: I

Air Transport IATA:

ICAO/IATA Class: 4.3
UN/ID Number: 1404
ERG Code: 4W
Shipping name: CALCIUM HYDRIDE

ICAO/IATA Subrisk: None
Packing Group: I

Maritime Transport IMDG:

IMDG Class: 4.3
UN Number: 1404
EMS Number: F- G, S- O
Shipping name: CALCIUM HYDRIDE

IMDG Subrisk: None
Packing Group: I

Section 15 - REGULATORY INFORMATION

REGULATIONS

No regulations applicable
No data available for calcium hydride as CAS: 7789-78-8.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
calcium hydroxide	1305- 62- 0, 1332- 69- 0

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

Issue Date: 28-Dec-2017