

**MATERIAL SAFETY DATA SHEET
CAUSTIC SODA SOLUTION**

Section 1 – Identification of Supplier

Trade name: Caustic soda solution, DC and MBC grades

Chemical name: Sodium hydroxide, solution

Chemical formula: NaOH

Alternative naming: Sodium hydrate, white caustic, lye

CAS N°: 1310-73-2

NIOSH / RTECS N°: WB4900000

Emergency response guide: 154

UN N°: 1824

Suppliers details: Chemical Initiatives (Pty) Ltd

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Section 2 – Hazard Identification

This is a non-flammable but corrosive and toxic liquid.

A corrosive irritant to skin, eyes and mucous membranes.

Causes severe burns to skin and eyes on contact – resulting in deep ulceration and subsequent scarring.

Ingestion of this substance can cause severe internal irritation and damage.

Toxic fumes are emitted when this substance is heated to decomposition.

Sodium hydroxide mist is emitted when strong solutions of caustic are mixed with water.

Section 3 – Composition / Information on Ingredients

Sodium hydroxide : 47.0 – 51.5 % m/m NaOH

Hazardous ingredients : Sodium hydroxide

Risk phrases : R14; R35; R40/21/22; R41; R52

Safety phrases : S1/2/13; S7/8/14; S23/24/25; S27/28; S36/37/38; S45

Section 4 – First Aid Measures

Inhalation: Remove patient from exposure, to fresh air immediately. Administer artificial respiration if breathing stops or shows signs of failure. Do not use mouth to

mouth resuscitation. Administer oxygen by facial mask if breathing continues to be difficult. Obtain immediate medical attention.

Skin contact: Remove all contaminated clothing and discard. Flush the affected skin with large amounts of water for at least 15 – 20 minutes until all soapiness is gone. If burns occur, cover the affected area with a sterile, dry, loose-fitting dressing. If irritation occurs or persists, obtain immediate medical attention.

Eye contact: Speed is essential. Immediately wash the eye(s) with clean water or a neutral saline solution, including under the eyelids, for at least 20 minutes. Take care not to rinse the contaminated water into the unaffected eye. Obtain immediate medical attention.

Ingestion: Do not induce vomiting. If the patient is conscious, give very large amounts of water to drink and repeat if vomiting occurs. If vomiting occurs, keep head lower than the hips to help prevent aspiration. Do not give anything by mouth to a person who is unconscious or otherwise unable to swallow. Maintain airway and respiration. Obtain immediate medical attention.

Further professional medical assistance: Symptomatic treatment and supportive therapy as indicated.

Section 5 – Fire Fighting Measures

Special hazards: Although non-combustible, this strong base can react with amphoteric metals, causing hydrogen generation, which may result in explosive mixtures. Use water spray to cool re exposed containers, until well after re has been extinguished. Stay away from ends of tanks.

Extinguishing media: Use an extinguishing media appropriate for the material that is burning. CO₂, dry chemical, fog or regular foam. In the absence of fog, a fine water spray may be used.

Special precautions: Keep water away from large amounts of this substance to avoid violent reaction. Use water spray only for the presence of a small amount of substance. Do not allow runoff from fire fighting to enter sewers, drains or watercourses.

Protection of fire fighters: An approved self-contained breathing apparatus must be worn. Although it will provide little or no thermal protection, chemical protective clothing must be worn when handling this substance.

Section 6 – Accidental Release Measures

Personal precautions: Ensure suitable personal protection during removal of

spillage. Cordon off the area and deny entry. Evacuate to an area away from the upwind of the incident, if possible, to higher ground. Always work upwind of any spill. Do not touch or walk through spilled material. Stop leaks if you can do so without risk. Sodium hydroxide mist is heavier than air and will accumulate in excavations, natural depressions and other confined spaces.

Environmental precautions: Do not allow product/runoff from fire or spillage control to enter sewers, drains or watercourses. Spillage or uncontrolled discharges into watercourses must be alerted to the Department of Water Affairs and other appropriate regulatory bodies.

Small spillage: Absorb with sand or other non-combustible absorbent material and place into polythene containers for disposal. Small spills can also be converted to neutral salts before disposal.

Large spillage: Dyke far ahead of the spill area for later disposal. Absorb residues with sand or other non-combustible absorbent material and place into polythene containers for disposal. Wash the spillage area down with minimum quantity of water and recover that water.

Section 7 – Handling and Storage

Handling: Avoid contact with the skin and eyes. Use in well-ventilated areas and keep container closed. When using do not eat, drink or smoke. Always wash hands before eating, drinking or smoking. Always wear chemical protective clothing when working with this substance. Avoid generation of any mists.

Storage: Store on a corrosion resistant surface (e.g. epoxy coated concrete). Store in tightly closed, designated mild steel containers, in a dry area, away from acids. Separate from common metals (e.g. aluminium or light alloys) and oxidising agents.

Section 8 – Exposure Controls and Personal Protection

Occupational exposure limit: Short term OEL-RL = $2\text{mg}/\text{m}^3$ NaOH; HCS REG.1995.

Engineering control measures: Provide adequate ventilation, including appropriate local extraction, to ensure that the occupational exposure limit for NaOH is not exceeded. Mechanical ventilation (dilution and/or local exhaust) is recommended for all indoor situations. Ensure eye wash fountains and quick drench showers are provided within the immediate work area for emergency use.

Personal protection: Respiratory protection. Ventilation and other forms of engineering controls are the preferred means for controlling exposures. In low concentrations a full-face canister mask must be available. For higher concentrations

self-contained breathing apparatus must be worn. In the event of sodium monoxide fumes being evolved, a full-face self-contained breathing apparatus or airline mask must be worn.

Eye protection: Goggles and a full-face shield must be worn. Wear full-face respiratory protection if there is a potential of sodium monoxide fumes being emitted.

Skin protection: Chemical protective clothing must be worn – an acid resistant overall with a Teflon lining is recommended. Overall must be buttoned to the neck and the sleeves worn over the gloves. When handling a large spillage, a full PVC chemical suit must be worn over the acid resistant overall. Wear suitable acid resistant impervious gloves – they must be of the long type which reach to the elbows and is worn underneath the sleeve when working with large amounts of this substance. Closed, acid resistant shoes must be worn when working with small amounts of this substance. Chemically resistant boots must be worn when handling larger amounts of this substance.

Other: A ready to use, safety shower and eyewash facility should be installed close to the working area. Showering is necessary after the removal of contaminated protective clothing. Contaminated clothing should be discarded if professionals specialising in the launder of chemically contaminated clothing are not available.

Section 9 – Physical and Chemical Properties

Appearance	Clear to slightly turbid, colourless, viscous liquid
Odour	Odourless
Flammability	Non-flammable
Freezing point (@101.3kPa)	6 – 8 °C
Boiling point(@101.3kPa)	± 140 °C
Latent heat of fusion	167.4 J/g (solid)
Liquid density(Water=1)	1.5 g/cm ³ @ 20 °C
Miscibility (Cold Water)	Miscible in all proportions
Miscibility(Other)	Alcohol; glycerol
Molecular weight	40.01 (solid) g/mol
Chemical family	Hydroxide

Section 10 – Stability and Reactivity

Stability: Sodium hydroxide is stable when kept in a tightly closed, impervious container. It absorbs carbon dioxide and moisture from the air.

Hazardous reactions: Sodium hydroxide solutions are incompatible with acids, flammable liquids, chlorinated hydrocarbons, aluminum, zinc, tin, nitromethanes and nitrous compounds. Sodium hydroxide solutions render glass container brittle over a period of time and can also slowly dissolve glass. Can react with sugar residues forming carbon monoxide. When adding water to concentrated sodium hydroxide solutions, localised overheating and possible splashing can occur, and toxic sodium hydroxide mists may be released. Always add concentrated sodium hydroxide solutions slowly and in small amounts to water. Sodium hydroxide solutions react corrosively with aluminum, zinc, and tin and contact with alloys of these metals can generate hydrogen gas, which is flammable and explosive. Violent polymerisation can occur when combined with acetaldehyde, acrolein and acrylonitrile. Hazardous decomposition products Thermal decomposition can result in the release of toxic fumes of sodium monoxide.

Section 11 – Toxicology

Eye contact: Direct eye contact can range from irritation, mild scarring to blistering, ulceration, clouded vision and ultimately blindness.

Skin contact: Contact with concentrated sodium hydroxide solutions can cause severe burns, resulting in deep ulceration and subsequent scarring. Repeated skin contact can cause dermatitis.

Ingestion: Ingestion will cause severe pain, burning of mouth, throat, oesophagus, vomiting, diarrhoea, collapse and possible death. Ulceration of and damage to the gastrointestinal tract is inevitable.

Inhalation: Mists of sodium hydroxide are mild to severe irritants to the nose, throat and lungs. At high levels, possible life threatening accumulation of fluid in the lungs (pulmonary oedema) may occur.

Toxicological information: Poison by intra-peritoneal route and moderately toxic by ingestion. Mutation data has been reported. Sodium hydroxide is not classified as a human carcinogen.

Section 12 – Ecological Information

Environmental fate: Runoff from re-control water or dilution water can cause pollution. Liquid has low volatility.

Toxicity and biodegradability: This substance is fatal to aquatic organisms and fish (including aquatic plants) if the pH of natural water-bodies is higher than pH8.

Persistence and degradation: The product is neutralised readily by reaction with the natural carbon dioxide in the air and will not persist in the environment. The product does not bio-accumulate.

Effect on effluent treatment: Large discharges may contribute to increased alkalinity in effluent treatment systems and injure sewage treatment organisms. Inform the management authorities on sewage works if this product enters the sewer.

Section 13 – Disposal Considerations

Disposal should be in accordance with local, regional or national legislation. Contaminated absorbent must be removed and disposed via an authorised waste contractor. Chemical additions, processing or otherwise altering this material may make the waste management information in this material safety data sheet incomplete, inaccurate or otherwise inappropriate.

Section 14 – Transport

Emergency response guide	154
UN N°	1824
UN Packing group air	
ICAO/IATA Class – primary	8 (Corrosives)
UN Packing group	8 (Corrosives)
Danger group	II (Substance presents a serious risk)
UN Packing group sea	
IMDG Class - primary	8 (Corrosives)
UN Packing Group	8 (Corrosives)
Danger group	II (Substance presents a serious risk)

Proper shipping name	Sodium hydroxide solution
Packaging method	13.8.3 (Liquid corrosives)
Road/rail	
ADR/RID Class	8 (Corrosive)
UN Packing group	8 (Corrosive)
Danger group	II (Substance presents a serious risk)
Packaging method	13.8.3 (Liquid corrosives)

Section 15 – Regulatory Information

Users should ensure that they comply with any relevant local, regional or national legislation.

SABS classification : Corrosive

Risk phrases R14: Reacts violently with water.

R35 : Causes severe burns.

R40/21/22 : Harmful; Possible risk of irreversible effects when in contact with skin and if swallowed

R41 : Risk of serious damage to eyes.

R52 : Harmful to aquatic organisms.

Safety phrases S1/2/13 : Keep locked up and out of reach of children, away from food, drink and animal feeding stuffs.

S7/8/14 : Keep container tightly closed and dry, away from acids and oxidising materials.

S23/24/25 : Do not breathe fumes emitted when mixed with water and avoid contact with skin and eyes.

S27/28 : Take off all contaminated clothing immediately and wash skin immediately with plenty of water.

S36/37/38 : Wear suitable chemical protective clothing, gloves and eye/face

protection and in case of insufficient ventilation, wear suitable respiratory equipment.

S45 : In case of an incident or if you do not feel well, seek medical advice immediately

Section 16 – Other Information

DISCLAIMER:

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