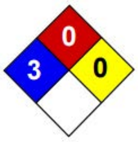
MATERIAL SAFETY DATA SHEET

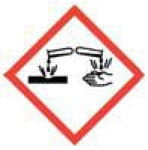


Health	3
Fire	0
Reactivity	0
Personal Protection	

1. Identification

GHS Product Identifier	SODIUM HYDROXIDE 1.00M SOLUTION
Recommended use of the chemical and restrictions on use	Used in chemical manufacturing (pH control, acid neutralization, off-gas scrubbing and catalyst); pulp and paper manufacturing; in petroleum and natural gas industry (removing acidic contaminants in oil and gas processing); manufacture of soap and detergents and other cleaning products; and cellulosics, such as rayon, cellophane and cellulose ethers; cotton mercerizing and scouring; water treatment; food processing; flue-gas scrubbing; mining; glass making; textile processing, laundering, and bleaching; refining vegetable oils; rubber reclamation; metal processing; etching and electroplating; oxide coating; electrolytic extraction of zinc; tin plating; aluminum processing; metal degreasing; drain and pipe cleaning; adhesive preparations; paint remover; wood treatment; disinfectant; cleaning of non-disposable bottles by the drink and beer industry; batteries; oven-cleaner pads; rubber latex stabilizer; stabilization of sodium hypochlorite; in making plastics to dissolve casein; pharmaceutic aid (alkalizer) and laboratory reagent.
Other Names	Caustic soda solution Lye
Other Information	Livingstone Int'l Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon Livingstone Int'l Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of Livingstone Int'l Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

2. Hazard Identification

GHS classification of the substance/mixture	Corrosive to Metals: Category 1 Skin Corrosion/Irritation: Category 1B
Signal Word (s)	DANGER
Hazard Statement (s)	H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage.
Pictogram (s)	Corrosion 
Precautionary statement – Prevention	P234 Keep only in original container. P260 Do not breathe mist/vapours/spray. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Precautionary statement – Response	P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting. P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

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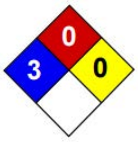

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Personal Protection	

	P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310 Immediately call a POISON CENTER or doctor/physician.
Precautionary statement – Storage	P405 Store locked up.
Precautionary statement – Disposal	P501 Dispose of contents/container to in accordance to local/regional/national/international regulations.

3. Composition/information on ingredients

Chemical Characterization	Liquid

Ingredients

Name	CAS	Hazard Symbol	Risk Phrase
Water	7732-18-5		
Sodium hydroxide	1310-73-2	C	R35

4. First-aid measures

Inhalation	Remove from exposure, rest and keep warm. Inhalation of any vapours from this product is not likely to present an acute hazard.
Ingestion	Rinse mouth thoroughly with water immediately. Give plenty of water to drink. Avoid vomiting (risk of perforation!). Never give anything by mouth to an unconscious person. Do not attempt to neutralize. If swallowed, do NOT induce vomiting. If vomiting occurs, keep head below hips to prevent aspiration into lungs. If vomiting occurs give further water to achieve effective dilution. If breathing but unconscious, place in the recovery position. Keep airways free. Seek immediate medical assistance.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Wash clothing before reuse. Seek urgent medical assistance.
Eye contact	If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Seek immediate medical assistance.
First Aid Facilities	Maintain eyewash fountain, safety shower and a general washing facility in work area.
Advice to Doctor	Treat symptomatically as for strong alkalis. Consult Poisons Information Centre. Treat symptomatically and supportively as for strong alkalis. Burns are not immediately painful; onset of pain may be minutes to hours. Symptoms of pulmonary oedema can be delayed up to 48 hours after exposure.
Protection for First Aiders	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing, or wear gloves.
Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 13 1126) or a doctor.

5. Fire-fighting measures

Suitable extinguishing media	Use fire extinguishing media appropriate for surrounding environment. Use water spray, dry chemical, carbon dioxide, or appropriate foam.
Specific hazards arising from the chemical	Material does not burn.
Hazchem Code	2R

6. Accidental release measures

Personal Precautions	Evacuate the area of all non-essential personnel. Avoid contact with skin, eyes.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)

Clean-up Methods - Small Spillages	Absorb or contain liquid with sand, earth or spill control material. Sweep up and remove to a suitable, clearly marked container for disposal in accordance with local regulations.

7. Handling and storage

Precautions for Safe Handling	Avoid contact with skin, eyes, or clothing. If ingested, seek medical advice immediately and show the container or the label. Wear appropriate protection. Change contaminated clothing. It is essential that all who come into contact with this material maintain high standards of personal hygiene ie. washing hands prior to eating, drinking, smoking or using toilet facilities.
Conditions for safe storage, including any incompatibilities	Corrosives area. Store in tightly closed containers, in a cool, dry, well-ventilated area away from sources of heat, moisture and incompatibilities. Store in original packages as approved by manufacturer. Absorbs carbon dioxide from air. Store away from water/moisture, acids, metals (aluminium, magnesium, zinc or tin).
Corrosiveness	Corrosivity to Metals: Corrosive to aluminium, tin, zinc, copper, brass and bronze. Corrosive to steel at elevated temperatures (above 40 °C). Not corrosive to nickel. Slowly attacks glass at room temperature.
Storage Regulations	Refer Australian Standard AS 3780-1994 'The storage and handling of corrosive substances'.
Storage Temperatures	Store at room temperature (15 to 23°C recommended). Protect from freezing.
Unsuitable Materials	Aluminium, magnesium, zinc or tin containers.

8. Exposure controls/personal protection

Other Exposure Information	A time weighted average (TWA) has been established for Sodium hydroxide - solid (Worksafe Aust) of 2 mg/m^3 (Peak limitation). The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. Peak Limitation - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.
Respiratory Protection	Where ventilation is not adequate, respiratory protection may be required. Avoid breathing vapours or mists. Select and use respirators in accordance with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust/mist filters. Filter capacity and respirator type depends on exposure levels.
Eye Protection	The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.
Hand Protection	Hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance. Recommendation: Excellent: NR latex, vinyl and nitrile. Good: Neoprene gloves
Footwear	Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.
Body Protection	Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.
Hygiene Measures	Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9. Physical and chemical properties

Form	Liquid

Appearance	Clear, colourless solution.
Odour	Odourless.
Melting Point	~ -1 °C (2%); ~ -3 °C (4%).
Boiling Point	~100 °C; 102 °C (5%).
Solubility in Water	Miscible (soluble) in all proportions.
Specific Gravity	1.0207 (2%wt); 1.03175 (3%wt); 1.0428 (4%wt).
pH	Basic. ~ 13.25 (2%); ~ 13.3 (3%); ~ 13.35 (4%).
Vapour Density (Air=1)	>1.0.
Viscosity	>1 (ether=1).
Flammability	Non combustible material.
Explosion Properties	Reactions with a number of commonly encountered materials can generate sufficient heat to ignite nearby combustible materials. Reactions with metals, such as aluminium, tin and zinc, can form explosive/flammable hydrogen gas. Reaction with ammonia + silver nitrate forms explosive products. Reaction with sodium salt of trichlorophenol + methyl alcohol + trichlorobenzene + heat can cause an explosion. Reaction with impure tetrahydrofuran, which can contain peroxides, can cause serious explosions. Benzene extract of allyl benzenesulfonate prepared from allyl alcohol, and benzene sulfonyl chloride in presence of aqueous sodium hydroxide, under vacuum distillation, residue darkened and exploded.
Molecular Weight	40.00 (pure substance).
Other Information	Taste: Strong alkaline taste.

10. Stability and reactivity

Chemical Stability	Stable at room temperature in tightly closed containers under ordinary conditions of use and storage. Sensitive to air. Sodium hydroxide rapidly absorbs carbon dioxide from the air (forming sodium carbonate). Moreover, contamination with iron is possible in carbon steel storage vessels or in lined carbon steel storage vessels where the liner has been impaired.
Conditions to Avoid	Extremes of temperature and direct sunlight, heat, moisture/water, light metals (aluminium, tin, or zinc), exposure to air, or carbon monoxide, and incompatible materials.
Incompatible Materials	Many organic and inorganic chemicals, such as strong acids, nitroaromatic, nitroparaffin and organohalogen compounds, glycols and organic peroxides, water, acetaldehyde, acrolein or acrylonitrile, sodium tetrahydroborate or metals, such as aluminium, tin, or zinc, 1,2- dichloroethylene, trichloroethylene or tetrachloroethane, solutions of sugars, such as fructose, lactose and maltose.
Hazardous Decomposition Products	Toxic fumes of sodium/sodium oxides (Na2O). Contact in moist air with light metals (like aluminium, zinc, tin and lead) may evolve combustible/explosive/flammable hydrogen gas.
Possibility of hazardous reactions	Reactions with many organic and inorganic chemicals, such as strong acids, nitroaromatic, nitroparaffin and organohalogen compounds, glycols and organic peroxides are vigorous, violent or explosive. Reaction with water is violent, generating significant heat, causing possible localized overheating and dangerously spattering corrosive sodium hydroxide. Reactions with sodium tetrahydroborate or metals, such as aluminium, tin, or zinc produce flammable and explosive hydrogen gas. Reactions with 1,2-dichloroethylene, trichloroethylene or tetrachloroethane can form spontaneously flammable chemicals. Reactions with solutions of sugars, such as fructose, lactose and maltose can produce carbon monoxide.
Hazardous Polymerization	Violently polymerizes acetaldehyde, acrolein or acrylonitrile.

11. Toxicological Information

Ingestion	May be harmful if swallowed. Ingestion may cause gastrointestinal tract irritation and possible burns of the mouth, pharynx, oesophagus, and gastrointestinal tract. May cause severe and permanent damage to the digestive tract, including perforation of the digestive tract (oesophagus and stomach). May cause severe pain, nausea, vomiting, diarrhoea, abdominal pain and shock. May affect central nervous system (depression, convulsions, coma, and possible death to respiratory failure) and the cardiovascular system (fall in blood pressure, fall in heart rate and inhibited respiration).
Inhalation	Sodium hydroxide has a negligible vapour pressure and is rapidly neutralized in air by carbon dioxide and therefore vapour exposure is not expected. Inhalation of aerosols may result in respiratory irritation, with coughing, burning sensation, dyspnoea, breathing difficulty and possible pulmonary oedema, chemical pneumonitis, emphysema, irreversible obstructive lung disease and coma.
Skin	Corrosive. Causes skin irritation and burns to the skin, which can result in redness, itchiness, pain and swelling. May cause deep, penetrating ulcers of the skin. Pain and sign of burns may be delayed, beginning with aching for several hours. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale colour. May be harmful if absorbed through the skin.
Eye	Corrosive. Causes severe irritation and burns to the eyes, which can result in redness, stinging, pain, lacrimation (tearing), blurred vision, loss of colour vision (blue vision), corneal oedema, photophobia, chemical conjunctivitis and possibly irreversible eye damage i.e. corneal burns. Risk of blindness!
Skin Sensitisation	Sodium hydroxide has been used widely and for a long time and no human cases of skin sensitisation have been reported and therefore sodium hydroxide is not considered to be a skin sensitizer.
Carcinogenicity	Not listed in the IARC Monographs. Alkalis are known to increase the risk of oesophageal cancer, which can occur years after the initial injury. The incidence of carcinoma following oesophageal injury from sodium hydroxide is 0.8-4%. Of the fifteen patients (age range 38-83) in a study by Isolauri and Markkula (1989) twelve had accidentally swallowed sodium hydroxide at the age of two or three years, one at fifteen years and one at twenty-three years of age. The time between ingestion and the diagnosis of oesophageal cancer was 22-81 years. Appelqvist and Salmo (1980) describe similar results, out of sixty patients with oesophageal cancer for which the time of ingestion was known, fifty-two had ingested the sodium hydroxide at the age of ten years or younger.
Chronic Effects	Repeated or prolonged exposure to this material will result in severe skin irritation leading to tissue destruction. Prolonged or repeated skin contact may cause dermatitis. Effects may be delayed.

12. Ecological information

Ecotoxicity	Toxic effect on fish and plankton. Harmful effect due to pH shift. Death of fish possible.
Information on Ecological Effects	Does not cause biological oxygen deficit.
Environmental Protection	Do not allow to enter waters, waste water, or soil!
Acute Toxicity - Fish	Fish toxicity: LC50: 189 mg/l (1 N solution = 40 g/l).
Sewage Treatment	Neutralization possible in waste water treatment plants.

13. Disposal considerations

Disposal Considerations	Dispose of according to relevant local, state and federal government regulations.

14. Transport information

Transport Information	Dangerous goods of Class 8 (Corrosive) are incompatible in a placard load with any of the following: Class 1, Class 4.3, Class 5, Class 6, if the Class 6 dangerous goods are cyanides and the Class 8 dangerous goods are acids, Class 7; and are incompatible with food and food packaging in any quantity.
U.N. Number	1824
UN proper shipping name	SODIUM HYDROXIDE SOLUTION
Transport hazard class(es)	8
Hazchem Code	2R
Packaging Method	3.8.8RT8
Packing Group	II
EPG Number	8A1
IERG Number	37

15. Regulatory information

Poisons Schedule	S5

16. Other Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons No. 3', Commonwealth of Australia, June 2012. Lewis, Richard J. Sr. 'Hawley's Condensed Chemical Dictionary 13th. Ed.', Rev., John Wiley and Sons, Inc., NY, 1997. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.', 2007. 'Labelling of Hazardous Workplace Chemicals, Code of Proctice' Safe Work Australia. Standards Australia 'AS 1940-2004 The Storage and Handling of Flammable and Combustible Liquids. Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand, 2010. Worksafe Australia, 'Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)]'. Worksafe Australia, 'Hazardous Substances Information System, 2005'. Worksafe Australia, 'National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]'. Worksafe Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)]'.
Empirical Formula & Structural Formula	NaOH (pure substance).

END OF MSDS