

MATERIAL SAFETY DATA SHEET

Company Details

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1. Product and Company Identification:

<u>Trade / Commercial Name</u>	ECOSULF L.A		
<u>Chemical Name</u>	sodium hydroxide solution cone> 5% (caustic soda liquor, sodium hydrate, lye)		
<u>Formula</u>	NaOH		
<u>Chemical Family</u>	011 Sodium compounds		
<u>Synonyms</u>			
<u>Un No</u>	1824	<u>Hazchem Code</u>	2r
<u>ERG No.</u>	154	<u>EAC</u>	60

2. Hazards Identification:

Corrosive
Non-Combustible
Contact with substance may cause severe damage: to skin, to eyes.
Effects of contact or inhalation may be delayed.
Fire may produce irritating, corrosive and/or toxic gases.
Runoff from fire control or dilution water may cause pollution.

3. Composition:

Hazardous Components sodium hydroxide solution cone> 5% (caustic soda liquor, sodium hydrate, lye)

4. First Aid Measures

<u>First Aid Skin</u>	Remove & isolate contaminated clothing and shoes. For minor skin contact, avoid spreading material on unaffected skin. Flush body with plenty of water for at least 20 minutes. Keep warm and quiet.
<u>First Aid Eyes</u>	Flush eyes with water for 20 minutes. Hold eyelids open while washing.
<u>First Aid Ingested</u>	Do not induce vomiting. Seek medical assistance.
<u>First Aid Inhalation</u>	Move victim to fresh air. If not breathing give artificial respiration. Do not use mouth-to-mouth, if victim has inhaled or ingested the substance; induce artificial respiration with the aid of a pocket mask with a one-way valve. If breathing of victim is difficult administer oxygen. Effects of exposure may be delayed.

5. Fire Fighting Measures

Small Fires: Dry chemical, CO2 or water spray.
Large Fires: Dry chemical, CO2, alcohol-resistant foam or water spray.
Move containers from fire area if you can do it without risk.
Dike fire control water for later disposal; do not scatter the material.
Fire involving Tanks or Bulk Containers: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
Do not get water inside containers. ALWAYS stay away from the ends of tanks.
Cool containers with flooding quantities of water until well after fire is out.
Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
Isolate spill or leak area immediately for at least 25 to 50 metres (80 to 160 feet) in all directions.
Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate enclosed areas.
Wear positive pressure self-contained breathing apparatus (SCBA).

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Wear chemical protective clothing which is specifically recommended by the manufacturer.
 Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.
 If ROAD OR RAIL TANKER is involved in a fire, ISOLATE for 800 metres (1/2 mile) in all directions;
 also, consider initial evacuation for 800 metres (1/2 mile) in all directions.

6. Accidental Release Measures

Full protective clothing including breathing apparatus
PRECAUTIONS:
 Restrict access to area.
 Provide adequate protective equipment and ventilation.
 Remove sources of heat and flame.
 Notify occupational and environmental authorities
SPILL OR LEAK:
 ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
 Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
 Stop leak if you can do it without risk.
 Prevent entry into waterways, sewers, basements or confined areas.
 Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
DO NOT GET WATER INSIDE CONTAINERS.

7. Handling And Storage

Separation of at least 3M from the following classes is recommended.
 Flammable Liquids Flammable Solids
 Spontaneously Combustibles Poison
 Fire separation of at least 5M or 4Hr fire resistant wall from the following classes is recommended.
 Flammable Gases Dangerous When Wet
 Oxidizing Agents Organic Peroxides
 Storage in the same room or space is prohibited with the following classes:
 The rooms or spaces should be at least 10M apart.
 Explosives Radioactive

8. Exposure Controls/Personal Protection

<u>Occupational Exposure Limits</u>	T	W	A	OEL-RL	SHORT TERM	OEL-RL
	-----				-----	
	PPMa)			MG/M3b)	PPMa)	MG/M3b)
	-----				-----	
	-			C 2	-	2

C = Ceiling Limit

Controls
 The control measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure.
 The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release.
 Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside.
 Supply sufficient replacement air to make up for air removed.
 Have a safety shower/eye wash fountain readily available in the immediate work area

Personal Protection
 If engineering controls and work practices are not effective in controlling this material, then wear suitable personal protection equipment, including chemical safety goggles & face shield, boots, imperious gloves, coveralls, & respiratory protection.
 Have appropriate equipment available for use in emergencies.

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9. Physical & Chemical Properties

Colourless to straw coloured solution, odorless
Boiling Point: solid: 1390 oC.
50% solution: 142 oC to 148 oC.
Melting Point: solid: 310 to 320 oC.
50% solution: 12 to 15 oC.
Solidification Point: 50% solution: 5 oC.
Completely soluble in water. Solid reacts with water with release of appreciable heat. Solids and concentrated solutions are highly hygroscopic.
Solid exposed to air dissolves in absorbed moisture and reacts with carbon dioxide forming harmless sodium carbonate.

10. Stability And Reactivity

<u>Conditions to Avoid</u>	Stable.
<u>Incompatible Materials</u>	It reacts with acids with release of heat. Solutions react with aluminium, zinc, tin and their alloys with release of highly flammable hydrogen.
<u>Other</u>	None.

11. Toxicological Information

Human Health

Solid NaOH is corrosive. Depending on the concentration, solutions of NaOH are non-irritating, irritating or corrosive and they cause direct local effects on the skin, eyes and gastrointestinal tracts. Based on human data concentrations of 0.5-4.0 % were irritating to the skin, while a concentration of 8.0 % was corrosive for the skin of animals. Eye irritation data are available for animals. The non-irritant level was 0.2-1.0 %, while the corrosive concentration was 1.2 % or higher. A study with human volunteers did not indicate a skin sensitisation potential of sodium hydroxide. This is supported by the extensive human experience.

The acute toxicity of sodium hydroxide depends on the physical form (solid or solution), the concentration and dose. Lethality has been reported for animals at oral doses of 240 and 400 mg/kg bw. Fatal ingestion and fatal dermal exposure has been reported for humans.

No valid animal data are available on repeated dose toxicity studies by oral, dermal, inhalation or by other routes for NaOH. However, under normal handling and use conditions (non-irritating) neither the concentration of sodium in the blood nor the pH of the blood will be increased and therefore NaOH is not expected to be systemically available in the body. It can be stated that the substance will neither reach the foetus nor reach male and female reproductive organs, which shows that there is no risk for developmental toxicity and no risk for toxicity to reproduction. Both in vitro and in vivo genetic toxicity tests indicated no evidence for a mutagenic activity.

Based on the available literature, there is a risk for accidental and intentional exposure to solid NaOH or to irritating or corrosive solutions of NaOH. Most of the ingestion accidents seem to be related with children and seem to occur at home. Accidental skin and eye exposure seem to be less frequently reported than ingestion in the medical literature. Dust formation is unlikely because of hygroscopic properties. Furthermore NaOH has a negligible vapour pressure and is rapidly neutralized in air by carbon dioxide and therefore dust and vapour exposure are not expected.

The hazard of NaOH for the environment is caused by the hydroxyl ion (pH effect). For this reason the effect of NaOH on the organisms depends on the buffer capacity of the aquatic or terrestrial ecosystem. Also the variation in acute toxicity for aquatic organisms can be explained for a significant extent by the variation in buffer capacity of the test medium. LC50 values of acute toxicity tests with aquatic organisms ranged between 33 and 189 mg/l.

Because the buffer capacity, the pH and the fluctuation of the pH are very specific for a certain ecosystem it was not considered useful to derive a PNEC or a PNEC_d. To assess the potential environmental effect of an NaOH discharge, the pH change of the receiving water should be calculated or measured. The change in pH should be compared with the natural variation in pH of the receiving water and based on this comparison it should be assessed if the pH change is acceptable.

The use of NaOH could potentially result in an emission of NaOH and it could locally increase the pH in the aquatic environment. However, the pH of effluents is normally measured very frequently and can be adapted easily and therefore a significant increase of the pH of the receiving water is not expected. If emissions of waste water are controlled by appropriate pH limits and/or dilutions in

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relation to the natural pH and buffering capacity of the receiving water, adverse effects on the aquatic environment are not expected due to production or use of NaOH.

Aquatic sodium emissions originating from uses of NaOH are probably small compared to other sources. It is clear that an environmental hazard assessment of sodium should not only evaluate all natural and anthropogenic sources of sodium but should also evaluate all other ecotoxicity studies with sodium salts, which is beyond the scope of this report.

11.1 Acute Oral

11.2 Acute Inhalation

11.3 Acute Dermal

No valid studies available. Although valid studies with animals are not available intentional and accidental ingestion of NaOH by humans has been reported frequently in the literature and for this reason there is no need for additional oral testing with animals. Furthermore gavage dosing of animals will not represent oral exposures in humans. The existing animal and human data on acute toxicity show that NaOH has a local effect and that systemic effects are not to be expected.

11.4.1 Skin irritation/corrosion Human

Human Patch Test, 0.2 ml 0.5 %: irritating for 55 % of volunteers
0.004-0.2 %: non-irritant 0.4 %: mild 1.2 %: corrosive

Human Patch Test, 0.2 ml 0.5 %: irritating for 61 % of volunteers

Human Different protocols 1.0 %: irritating for about 50 % of volunteers

Human Filter paper discs 0.5 and 1.0 %: irritating

11.4.2 Eye irritation/Corrosion Rabbit

Rabbit Dose of 0.1 ml, EPA (1981) criteria for classification

0.004-0.2 %: non-irritant

0.4 %: mild

1.2 %: corrosive

Rabbit Modified Draize testing

0.1 and 0.3 %: no conjunctivitis nor iritis

1.0 and 3.0 %: conjunctivitis and iritis

Rabbit OECD Guideline 405

1 %: Not irrit

2 %: Irritating

Repeated dose

No valid studies available. However, under normal handling and use condition (non-irritating) NaOH is not expected to be systemically available in the body.

For this reason additional testing for repeated dose toxicity is considered unnecessary.

Genetic Toxicity In vitro

Bacterial Test

S. typhimurium Ames reversion test - (without metabolic activation)
- (with metabolic activation)

E. coli DNA repair test - (without metabolic activation)
- (with metabolic activation)

Non-Bacterial In Vitro Test

Chinese hamster ovary Chromosome

(CHO) K1 cells aberration test - (without metabolic activation)

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+ (with metabolic activation),
probably due to formation of
clastogenic breakdown products of S9

Genetic Toxicity In vivo

Mouse bone-marrow cells:- Micronucleus test: Negative

12. Ecological Information

- 12.1 Acute/prolonged toxicity to fish
- 12.2 Acute toxicity to aquatic invertebrates
- 12.3 Toxicity to aquatic plants e.g. algae
- 12.4 Toxicity to microorganisms e.g. bacteria
 - 12.4.1 Chronic toxicity to fish
 - 12.4.2 Chronic toxicity to aquatic invertebrates Ceriodaphnia sp.: EC50 = 40 mg/l (Warne et al., 1999).

No other valid studies available. The hazard of NaOH for the environment is caused by the hydroxyl ion (pH effect). For this reason the effect of NaOH on the organisms depends on the buffer capacity of the aquatic or terrestrial ecosystem. Also the variation in acute toxicity for aquatic organisms can be explained for a significant extent by the variation in buffer capacity of the test medium. LC50 values ranged between 33 and 189 mg/l. Because the buffer capacity, pH and the fluctuation of the pH are very specific for a certain ecosystem it was not considered useful to derive a PNEC. For this reason there is no need for additional toxicity testing with NaOH.

13. Disposal Considerations

Disposal Method Product There are no uniform EC regulations for the disposal of chemicals or residues. Chemical residues generally count as special waste. The disposal of the latter is regulated in the EC member countries through corresponding laws and regulations. We recommend that you contact the authorities in charge or approved waste disposal companies which will advise you on how to dispose of special waste.

Disposal Method Packaging Disposal in accordance with local legal provisions.

14. Transport Information

<u>UN No</u>	1824	<u>Hazchem Code</u>	2r
<u>ERG No.</u>	154	<u>EAC</u>	60
<u>IMDG-Shipping Name</u>	SODIUM HYDROXIDE SOLUTION		
<u>IMDG Code</u>	8215	<u>IMDG-Packaging Group</u>	II/III
<u>Marine Pollutant</u>	Yes		
<u>Class</u>	Class: 8 Corrosive Group: II/III		
<u>Subsidiary Risks</u>	None		

15. Regulatory Information

EEC Hazard Classification 8

Risk Phrases
R21 Harmful in contact with skin.
R22 Harmful if swallowed.
R34 Causes burns.
R43 May cause sensitization by skin contact.
R52 Harmful to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.

Safety Phrases
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.



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- S36 Wear suitable protective clothing.
- S37 Wear suitable gloves.
- S39 Wear eye / face protection.
- S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.)
- S61 Avoid release to the environment. Refer to special instructions / safety data sheets.

National Legislation

16. Other Information

Reason for Alteration: General update.

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properness of the product.

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