

Product Name: Sodium Hydroxide Solution (50%)

Revision Date: January 27, 2006

Revision No.: 4

OCEAN NETWORK EMERGENCY PHONE 1-888-2891-911

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD. (REFER TO THE OSHA CLASSIFICATION IN SEC.I.) THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE. THE EXPOSURE TO THE COMMUNITY, IF ANY, IS QUITE DIFFERENT.

I - PRODUCT IDENTIFICATION

Product Name:	Sodium Hydroxide Solution (50%)
Synonyms:	Caustic Soda, Caustic, Alkali, Lye, Caustic Lye
Chemical Family:	Alkali, Base
Formula:	NaOH
Use Description:	Neutralizing agent, sodium source
Hazard Classification:	Corrosive, eye and skin hazard, lung toxin
Product Code:	105016, 105017, 105018, 105187, 105188, 105365
File No.:	MSDS0200M

II - COMPONENT DATA

This Product Composition information presented here describes the major components and their concentrations found in this product and other information as required by OSHA. This is not, and should not be interpreted, or used as, a Product Specification or a detailed chemical analysis.

Established Federal OSHA PEL is provided. OSHA Agreement State PEL may be different.

Product Composition

CAS or Chemical Name:	Sodium Hydroxide				
CAS Number:	1310-73-2				
Percentage Range:	45-50%				
Hazardous Per 29 CFR 1910.1200:	Yes				
Exposure Standards:	OSHA (PEL) *		ACGIH (TLV)		
		ppm	mg/M ³	ppm	mg/M ³
	TWA:	N/A	2	N/A	None
	CEILING:	N/A	None	N/A	2
	STEL:	N/A	None	N/A	None

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CAS or Chemical Name:	Water
CAS Number:	7732-18-5
Percentage Range:	45-55%
Hazardous Per 29 CFR 1910.1200:	No
Exposure Standards:	None established.

III - PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER. AVOID BREATHING VAPOR OR MIST.

STORAGE CONDITIONS:

DO NOT STORE AT TEMPERATURES ABOVE: 130° C (266° F)

PRODUCT STABILITY AND COMPATIBILITY:

SHELF LIFE LIMITATIONS:	Indefinite if in closed container.
INCOMPATIBLE MATERIALS FOR PACKAGING:	Aluminum, zinc, tin, wood, paper
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT:	Acids, nitrogen containing organics, phosphorous, explosives, organic peroxides, aluminum, zinc, tin, halogenated hydrocarbons

IV - PHYSICAL DATA

Appearance:	Clear, viscous liquid
Freezing Point:	10-12° C (50-54° F)
Boiling Point:	130-140° C (266-284° F)
Decomposition Temperature:	None
Specific Gravity:	1.482-1.53
Bulk Density:	Not Applicable
pH @ 25° C:	13 (0.5% Solution)
Vapor Pressure @ 25° C:	Approximately equal to water
Solubility in Water:	Miscible
Volatiles, Percent by Volume:	45-55
Evaporation Rate:	No Data
Vapor Density:	No Data
Molecular Weight:	40.01 (Active agent)
Odor:	None
Coefficient of Oil/Water Distribution:	No Date

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V - PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Personal Protection for Routine Use of Product:

Respiratory Protection:	If mists, or aerosols are generated and are not controlled below the TLV with ventilation wear a NIOSH approved dust/mist respirator.
Ventilation:	Use Local exhaust ventilation to maintain levels to below the TLV.
Skin and Eye Protection:	Wear gloves, boots, face shield with chemical goggles, apron or impermeable suit to avoid skin and eye contact.
Other:	Emergency eye wash and safety showers must be made available in the immediate work area.

Equipment Specifications (When Applicable):

Respirator Type:	NIOSH N95 filter respirator, or better.	
Protective Clothing Type: (This includes: gloves, boots, apron, protective suit.)	GLOVE TYPE:	Neoprene
	BOOT TYPE:	Neoprene
	APRON TYPE:	Neoprene
	PROTECTIVE SUIT:	Neoprene

VI - FIRE AND EXPLOSION HAZARD INFORMATION

Flammability Data:

Explosive:	
Flammable:	No
Combustible:	No
Pyrophoric:	No
Flash Point:	Not Applicable
Autoignition Temperature:	Not Applicable
Flammable Limits at Normal Atmospheric Temperature and Pressure (Percent Volume in Air):	Not Applicable

NFPA Ratings:

Health:	3
Flammability:	0
Reactivity:	1

HMIS Ratings:

Health:	3
Flammability:	0
Reactivity:	1

Extinguishing Media:

Not Applicable - Choose extinguishing media suitable for surrounding materials.

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Fire Fighting Techniques and Comments:

Use water to cool containers exposed to fire. Contact with reactive metals, e.g., aluminum may result in the generation of flammable hydrogen gas. See Section XI for protective equipment for fire fighting. Sodium Hydroxide may react with water. (See Section 7). On small fires, use dry chemical, carbon dioxide, water spray, or foam. On large fires, use water-flooding quantities as a fog.

VII - REACTIVITY INFORMATION

Conditions Under Which This Product May Be Unstable:

Temperatures Above:	None
Mechanical Shock or Impact:	No
Electrical (Static) Discharge:	No
Other:	Contact with carbohydrates, aluminum, zinc, and tin.
Hazardous Polymerization:	Will not occur
Incompatible Materials:	Acids, nitrogen containing organics, explosives, carbohydrates, phosphorous, organic peroxides, halogenated hydrocarbons
Hazardous Decomposition:	Contact with carbohydrates can produce carbon monoxide. Contact with aluminum, zinc, or tin can produce hydrogen gas.

Summary of Reactivity:

Explosive:	No
Oxidizer:	No
Pyrophoric:	No
Organic Peroxide:	No
Water Reactive:	No
Corrosive:	Yes

VIII - FIRST AID

Eyes

Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention at once.

Skin

Immediately flush with water for at least 15 minutes. Seek medical attention. If clothing, shoes and/or jewelry come in contact with the product, they should be removed immediately and laundered before re-use.

Ingestion

Immediately drink large quantities of water. DO NOT induce vomiting. Seek medical attention at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

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Inhalation

If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Seek medical attention. In the event that an individual inhales enough vapors to lose consciousness, person should be moved to fresh air at once and seek medical attention immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

IX - TOXICOLOGY AND HEALTH INFORMATION

Routes of Absorption

Inhalation, skin and eye contact, ingestion

Warning Statements and Warning Properties

HARMFUL IF SWALLOWED. CAUSES SKIN, EYE, DIGESTIVE TRACT AND RESPIRATORY TRACT BURNS. CAN CAUSE LUNG DAMAGE.

Human Threshold Response Data

Odor Threshold:	No data.
Irritation Threshold:	No data.
Immediately Dangerous to Life or Health:	10 mg/M ³ .

Signs, Symptoms and Effects of Exposure

Inhalation

Acute:	Inhalation of this material is irritating to the nose, mouth, throat and lungs. It may also cause burns to the respiratory tract, which can result in shortness of breath, wheezing, choking, chest pain, and impairment of lung function. Inhalation of high concentrations can result in permanent lung damage.
Chronic:	Chronic (repeated) inhalation exposure may cause impairment of lung function and permanent lung damage.

Skin

Acute:	Dermal exposure can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause permanent damage.
Chronic:	Effects from chronic skin exposure would be similar to those from single exposure except for effects secondary to tissue destruction.

Eye

Severe irritation and/or burns can occur following eye exposure. Direct contact may cause impairment of vision and corneal damage.

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Ingestion

Acute:	Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, and bleeding and/or tissue ulceration. Ingestion causes severe damage to the gastrointestinal tract with the potential to cause perforation.
Chronic:	There are no known or reported effects from chronic exposure. Chronic ingestion of significant amounts of this product is unlikely because of its acute corrosive action.

Medical Conditions Aggravated by Exposure

Asthma, respiratory and cardiovascular disease

Interactions with Other Chemicals Which Enhance Toxicity

There are no chemicals known to enhance the toxicity of the product.

Animal Toxicology

Acute Toxicity

Inhalation LC 50: No Data

Oral LD 50: Believed to be 300 - 500 mg/kg. (rat); harmful if swallowed

Dermal LD 50: Believed to be > 2 g/kg. (rabbit)

Irritation: Causes burns to eyes and skin.

Acute Target Organ Toxicity

This product is corrosive to all tissues contacted and upon inhalation, may cause irritation to mucous membranes and respiratory tract.

Chronic Target Organ Toxicity

There are no known or reported effects from repeated exposure except that secondary to burns.

Reproductive and Developmental Toxicity

There are no known or reported effects on reproductive function or fetal development from exposure to this product.

Carcinogenicity

This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

Ingestion of massive doses of sodium hydroxide has led to the development of tumors of the esophagus. The relevance of these findings to cancer is unknown due to repeated tissue destruction and scar formation as a result of the corrosive nature of sodium hydroxide.

Mutagenicity

Sodium hydroxide has been tested and was found to be non-mutagenic in the Ames assay, a bacterial DNA-repair test and in the Syrian hamster embryo (SA7/SHE) cell

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transformation assay.

Aquatic Toxicity

Caustic soda is not lethal to fully developed fish in natural fresh waters until the pH becomes greater than 9.0:

Lethal pH for Goldfish: 10.9

Lethal pH for Bluegill sunfish: 10.5

Gambusia affinis (mosquito fish), 96 hr. LC50: 125 mg/l

Bluegill, 48 hr. LC50: 99 mg/l

X - TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT Description from the Hazardous Materials Table 49 CFR 172.101:

Land (U.S. DOT):	SODIUM HYDROXIDE SOLUTION, 8, UN1824, PG II
Water (IMO):	SAME AS ABOVE
Air (IATA/ICAO):	SAME AS ABOVE
Hazard Label/Placard:	CORROSIVE
Reportable Quantity:	1000 lbs. (Per 49 CFR 172.101, Appendix)
Emergency Guide:	154

XI - SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

Reportable Quantity: 1000 lbs. (Per 40 CFR 302.4)

Spill Mitigation Procedures:

Hazardous concentrations in air may be found in local spill area in the form of a mist, which may cause skin irritation and breathing problems. Stop source of spill as soon as possible, if safe to do so.

Air Release:	Will normally be found in a mist form and evacuation from the mist area is the only advisable approach. Correction of the source of mist is of the utmost importance.
Water Release:	This material is heavier than and is soluble in water. This material is subject to emulsification and must be removed via a vacuum system or neutralized and absorbed as necessary, with various commercial absorbents, which are available. Notify all downstream industrial, municipal and public operation of this spill and advise them to monitor until otherwise notified.
Land Spill:	Dike or divert flow of material to a diked area as soon as possible. If necessary create an excavation large enough to contain the spill and associated neutralization materials. To reduce environmental damage, line the excavated surface with a material to which it is compatible and begin neutralization process or remove by vacuum, or pumping.

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Spill Residues:

Dispose of per guidelines under Section 12, WASTE DISPOSAL.

This material may be neutralized for disposal; you are requested to contact OCEAN at 888-2891-911 before beginning any such operation.

Personal Protection for Emergency Spill and Firefighting Situations:

In case of fire use normal fire fighting equipment (including self contained breathing apparatus: SCBA).

A hazardous physical characteristic of this product is: corrosive

XII - WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D002.

If this product becomes a waste, it will be a hazardous waste, which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII - ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:

This substance is listed on the Toxic Substances Control Act inventory.

NSF LIMITS: NSF Maximum Drinking Water Use Concentration - 100 mg/l (dry basis)

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III:

HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH:

Immediate (Acute)

PHYSICAL:

None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

None Established

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XIV - ADDITIONAL INFORMATION

Change in Section XIII 1/06

XV - MAJOR REFERENCES

1. DeFlora, Silvio, et al., Genotoxic Activity and Potency of 135 Compounds in the Ames Reversion Test and in a Bacterial DNA-Repair Test. Mutation Research, Vol. 133, pp. 161-198, 1984.
2. ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, 1997. American Conference of Governmental Industrial Hygienists, Inc., Cincinnati, OH.
3. Federal Register, Vol. 53, No. 237, Friday, December 8, 1988, 49688-49690. 40 CFR Part 372, Sodium Hydroxide: Toxic Chemical Release Reporting, Community Right-to-Know.
4. AQUIRE Database (aquatic toxicity), Chemical Information Systems, Inc. (a division of PSI International, Inc.), Towson, MD.
5. TOXNET Database, U.S. National Library of Medicine, Bethesda, MD .
6. Forsberg, K., and S.Z. Mansdorf, Quick Selection Guide to Chemical Protective Clothing, Second Edition, Van Nostrand Reinhold, N.Y., 1993.
7. 3M 1995 Respirator Selection Guide. 3M Occupational Health and Environmental Safety Division, St. Paul, MN., 1995.

Other References are available upon request.

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO MAKE CERTAIN THAT THIS SHEET IS CURRENT.

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