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Safety Data Sheet
(SODIUM HYDROXIDE 4% SOLUTION)

1 – PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ..... SODIUM HYDROXIDE 4% SOLUTION
CHEMICAL NAME/
CLASS/SYNONYMS: None
PRODUCT NUMBER: ..... SODIUM HYDROXIDE 4% SOLUTION
UN/NA NUMBER: 1824
CHEMICAL FAMILY: ..... Sodium salt
CAS NUMBER: ..... Not applicable for mixtures.
FORMULA: ..... NaOH

COMPANY: ..... **Lab Alley LLC**
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DATE PREPARED: ..... February 28, 2019

2 – HAZARDS IDENTIFICATION

GHS HAZARD CLASSIFICATION:

Physical Hazards
Flammable Liquids: ..... . No hazard statement
Health Hazards
Acute Toxicity (Oral): ..... . Category 3 - Toxic if swallowed, in contact with skin, inhaled
Skin Corrosion/Irritation: ..... . Category 1A - Causes severe skin burns and eye damage
Serious Eye Damage/Irritation: Catagory 1 - Causes severe eye damage
Aspiration Hazard: ..... . Catagory 1 - May be fatal if swallowed and enters airways

WARNING LABEL ITEMS INCLUDING PRECAUTIONARY STATEMENTS:

Pictograms:

SIGNAL WORD: ..... DANGER!

GHS HAZARD AND PRECAUTIONARY STATEMENTS:

H300 H310 H330: Fatal if swallowed, in contact with skin or if inhaled
H341: Suspected of causing genetic defects
H361: Suspected of damaging fertility or the unborn child

P101+102+103: If medical advice is needed, have product container or label at hand. Keep out of the reach of children. Read label before use.
P202+270+280+281: Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required.

P501: Dispose of contents/container: Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

TOTAL VOC's: None

3 – COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER
Sodium Hydroxide	4	1310-73-2
Water	96	7732-18-5

4 – FIRST-AID MEASURES

BREATHING (INHALATION): Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial resuscitation. Keep person warm and at rest. Treat symptomatically and supportively. Seek medical attention immediately. Qualified medical personnel should consider administering oxygen.

SWALLOWING (INGESTION): Give large amounts of fresh water or milk immediately. Do not give anything by mouth if person is unconscious or otherwise unable to swallow. If vomiting occurs, keep head below hips to prevent aspiration. Treat symptomatically and supportively. Seek medical attention immediately.

EYES: ..... Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

SKIN (DERMAL):..... Remove contaminated clothing and wash affected skin with soap and water. If persistent irritation occurs, obtain medical attention. When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.

NOTE TO PHYSICIAN: ..... May cause caustic burns to the mouth, throat or stomach if swallowed. After swallowing danger of stomach perforation. On inhalation: Irritation of mucous membrane, coughing and shortness of breath. All treatments should be based on observed signs and symptoms of distress in the patient. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

5 – FIRE-FIGHTING MEASURES

GENERAL FIRE HAZARDS: .... Fire fighters should wear full protective clothing, including self-contained breathing equipment.

AUTOIGNITION TEMP:..... NA

EXTINGUISHING MEDIA: Determined by surrounding material. In case of fire, use water fog, dry chemical, CO_2, or "alcohol" foam.

SPECIAL FIRE FIGHTING PROCEDURES: ..... No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. Spilled product may be slippery.

UNUSUAL FIRE AND EXPLOSION HAZARDS: ..... Containers may explode from internal pressure if confined to fire. Cool with water spray.

6 – ACCIDENTAL RELEASE MEASURES

SPILL PROCEDURES: ..... Wear appropriate personal protective equipment before approaching spill site. For small spills, dilute with water to sewer if allowed by local and state regulations. If unable to wash product with water, absorb with inert material (sand or other approved material) and dispose of in accordance with applicable regulations.

WASTE DISPOSAL: ..... Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

7 – HANDLING and STORAGE

STORAGE: Keep in a tightly closed container, stored in a cool, dry, ventilated area below 44°C (110°F). Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Drum must not be washed out or used for other purposes.

HANDLING:..... Avoid contact with eyes, skin and clothing. Do not inhale vapors and fumes. Wash thoroughly after handling. Use only with adequate ventilation. Do not take internally. For industrial use only.

8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS

HAZARDOUS INGREDIENT	PEL	TLV-TWA
Sodium Hydroxide	2 mg/m^3	2 mg/m^3
Water	None Established	None Established

EXPOSURE CONTROLS: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

RESPIRATORY PROTECTION: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

PROTECTIVE CLOTHING: **Eye/face protection:** Wear chemical goggles; face shield (if splashing is possible). **Skin protection:** Chemical resistant, impermeable gloves. Gloves should be tested to determine suitability for prolonged contact. Use of impervious apron or chemical suit and chemical resistant boots are recommended.

ADDITIONAL MEASURES: Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Safety shower and eye wash should be available close to work areas.

9 – PHYSICAL / CHEMICAL PROPERITES

BOILING POINT: 212°F (100°C)
FREEZING POINT: 35°F (1.66°C)
FLASHPOINT:..... Non-flammable material
UPPER FLAME LIMIT (%): ..... NA
LOWER FLAME LIMIT (%): ... NA
VAPOR PRESSURE:..... ND

VAPOR DENSITY (AIR=1):..... > 1
SPECIFIC GRAVITY: ..... 1.035 - 1.045
pH: ..... 4% solution 13.80 - 14.00
SOLUBILITY IN WATER:..... Complete
VOLATILITY
INCLUDING WATER: 8.69 pounds per gallon
MOLECULAR WEIGHT: ..... NA
EVAPORATION RATE:..... NA
PHYSICAL STATE: ..... Liquid
COLOR: ..... Clear
ODOR:..... Bland

10 – STABILITY and REACTIVITY

STABILITY: ..... Stable
HAZARDOUS DECOMP.:..... Will not occur
INCOMPATIBILITY: ..... Avoid direct contact with strong acids. Add slowly to water or acids with dilution and agitation to minimize the possible exothermic reaction. Avoid contact with aluminum, tin, zinc, leather, and organic halogen or nitro compounds. Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may cause violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry.
HAZARDOUS REACTIONS: Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).

11 – TOXICOLOGICAL INFORMATION

THRESHOLD LIMIT VALUE: 2 mg/m^3
OSHA PEL: 2 mg/m^3
LISTED CARCINOGEN: This product IS NOT listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or found to be a potential carcinogen by OSHA.
MEDICAL CONDITION AGGRAVATED: ..... Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Respiratory system. Eyes. Skin.

INFORMATION ON ACUTE TOXICOLOGICAL EFFECTS

ORAL

Product:..... The reported lethal dose in rats is 140-340 mg/kg. Ingestion may cause a burning sensation in the mouth, corrosion of thelips, mouth, tongue and pharynx, and severe esophageal and abdominal pain, vomiting of blood and large pieces of mucosa, and bloody diarrhea. Asphyxia can occur from swelling of the throat. Mediastinitis, alkalemia, pallor, weak, slow pulse, cardiovascular collapse, shock, coma and death may occur. Perforation of the alimentary tract and constrictive scarring may result. Esophageal stricture may occur weeks, months, or even years later to make swallowing difficult. The estimated fatal dose in man is 5grams. Cases of squamous cell carcinoma of the esophagus have occurred with latent periods of 12 to 42 years after ingestion. These cancers were believed to be sequela of tissue destruction and possibly scar formation rather than the result of direct carcinogenic action of sodium hydroxide.

DERMAL

Product:..... Upon contact with the skin, damage including redness, cutaneous burns, skin fissures and white eschars may occur without immediate pain. Exposure to solutions as weak as 0.03 N (0.12%) for 1 hour has caused injury to healthy skin. With solutions of 0.4-4%, irritation does not occur until after several hours. Solutions of 25-50%caused no sensation of irritation within 3 minutes in human subjects. Skin biopsies from human subjects having 1 N sodium hydroxide applied to their arms for 15 to 180 minutes showed progressive changes beginning with dissolution of the cells in the horny layer and progressing through edema to total destruction of the epidermis in 60 minutes. A 5% aqueous solution caused severe necrosis to the skin of rabbits when applied for 4 hours. Alkalies penetrate the skin slowly. The extent of injury depends on the duration of contact. If sodium hydroxide is not removed from the skin, severe burn swith deep ulceration may occur. Exposure to the dust or mist may cause multiple small burns and temporary loss of hair. Pathologic findings due to alkalies may include gelatinous, necrotic areas at the site of contact.

INHALATION

Product: Effects due to inhalation of dusts or mist may vary from mild irritation of the nose at 2 mg/m^3 to severe pneumonitis depending on the severity of exposure. Low concentrations may cause mucous membrane irritation with sore throat, coughing, and dyspnea. Intense exposures may result in destruction of mucous membranes and delayed pulmonary edema or pneumonitis. Shock may occur.

REPEATED DOSE TOXICITY

Product:..... Anepidemiologic study of 291 workers chronically exposed to caustic dusts for 30 years or more found no significant increase in mortality in relation to duration or intensity of such exposures.

SKIN CORROSION / IRRITATION

Product:..... Effects are dependent upon concentration and duration of exposure. Dermatitis or effects similar to those for acute exposure may occur.

SERIOUS EYE DAMAGE / IRRITATION

Product:..... Contact may cause disintegration and sloughing ofconjunctival and corneal epithelium, corneal opacification, marked edemaand ulceration. After 7 to 13 days either gradual recovery begins or thereis progression of ulceration and corneal opacification. Complications ofsevere eye burns are symblepharon with overgrowth of the cornea by a vascularized membrane, progressive or recurrent corneal ulceration and permanent corneal opacification. Blindness may occur.

RESPIRATORY OR SKIN SENSITIZATION

Product:..... Anepidemiologic study of 291 workers chronically exposed to caustic dusts for 30 years or more found no significant increase in mortality in relation to duration or intensity of such exposures.

MUTAGENCITY

IN VITRO

Product:..... No Data Available

IN VIVO

Product:..... No Data Available

Specified Substance(s)	**Information as provided by manufacturer**
Sodium Hydroxide 4% Solution	No Data Available

CARCINOGENICITY

Product:..... As per manufacturer: After extensive testing and more than 100 years of industrial experience with caustic soda, there is no evidence that caustic is a skin sensitizer or is readily absorbed through the skin. It is not a known carcinogen, mutagen, developmental toxicant or reproductive toxicant.

REPODUCTIVE TOXICITY

Product:..... Based on available data the classification criteria are not met. Not classified as hazardous.

SPECIFIC TARGET ORGAN TOXICITY – SINGLE EXPOSURE

Product: I**NHALATION:** Exposure to vapor, mist or liquid can produce burns of the respiratory tract. Severe exposures could result in chemical pneumonia. **EYES:** Contact can cause severe damage including burns and blindness. The severity of the effects depend on concentration and how soon after exposure the eyes are washed. **SKIN:** Corrosive. Contact may cause burns and tissue destruction. Note that irritation may follow an initial latency (delay between the time the exposure occurs and when the sense of irritation starts). The latent period can vary as much as hours for a dilute solution (0.04%) to minutes with more concentrated solutions (25 - 50%). Prolonged or repeated contact, even to dilute concentrations, can cause a high degree of tissue destruction. **INGESTION:** Corrosive. Severe burns and complete tissue perforation of mucous membranes of mouth, throat and stomach.

SPECIFIC TARGET ORGAN TOXICITY – REPEATED EXPOSURE

Product: **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Not available. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance is toxic to lungs. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

ASPIRATION HAZARD

Product:..... Droplets of the product aspirated into the lungs through ingestion or vomiting may cause chemical pneumonia.

OTHER ADVERSE EFFECTS

Product:..... No data available

12 – ECOLOGICAL INFORMATION

ACUTE TOXICITY

FISH

Product:..... Bluegill sunfish: 48-hour LC50 = 99 mg/L Mosquito fish: 96-hour LC50 = 125 mg/L Brown shrimp (Crangon crangon): 48-hour LC50 = 30 - 100 mg/L

AQUATIC INVERTEBRATES

Product:..... Daphnia magna - Water flea: Acute LC50 196 mg/L Marine water.

CHRONIC TOXICITY
FISH
Product:..... Concentrations of 20 to 100 mg/L have been reported to kill salmon, trout, carp and crayfish.
AQUATIC INVERTEBRATES
Product:..... Expected to have low toxicity: 10 < LC/EC/IC50 <= 100 mg/l
TOXICITY TO AQUATIC PLANTS
Product:..... Freshwater algae are destroyed above pH 8.5.

PERSISTENCE AND DEGRADABILITY

BIODEGRADATION
Product:..... The methods for determining the biological degradability are not applicable to predominately inorganic substances.
BIOLOGICAL OXYGEN DEMAND
Product:..... No data available
CHEMICAL OXYGEN DEMAND
Product:..... No data available
BOD / COD RATIO
Product:..... No data available
BIOACCUMULATIVE POTENTIAL
Product:..... Sodium hydroxide does not bioaccumulate due to its high solubility in water. It is considered slightly toxic to aquatic organisms unless there is a significant pH shift outside the range of 5 – 10; this change may be toxic to aquatic organisms.
MOBILITY IN SOIL
Product:..... Expected to partition to water. The pH effect of sodium hydroxide in water is naturally reduced by the absorption of atmospheric carbon dioxide. This reduction is also effected by dilution with water and by the natural acidity of a given water body. There is no degradation of sodium hydroxide in waters, only loss by absorption or through chemical neutralization.
RESULTS OF PBT AND mPvB ASSESSMENT
Product:..... Not fulfilling PBT (persistent/bioaccumulative/toxic) criteria. Not fulfilling vPvB (very persistent, very bioaccumulative) criteria.
OTHER ADVERSE EFFECTS
Product: ..... No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this product.

13 –DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: ..... Treatment, storage, transportation and disposal must be in accordance with Federal, State/Provincial and Local Regulations. Regulations may vary in different locations. Characterization and compliance with applicable laws are the responsibility solely of the generator. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14 – TRANSPORTATION INFORMATION

Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.

UN/NA NUMBER: 1824
PROPER SHIPPING NAME: ..... Sodium Hydroxide, solution
HAZARD CLASS: 8
PACKAGING GROUP : II
LETTER: ..... C (Corrosive substances)
ENVIRONMENTAL HAZARD: Environmental Hazard Value Score (IRCH) = 29. Caustic soda does not bioaccumulate due to its high solubility in water. It is considered slightly toxic to aquatic organisms unless there is a significant pH shift outside the range of 5 – 10, which may be toxic to aquatic organisms.
REPORTABLE QUANTITY: 17,120 pounds based on Sodium Hydroxide in mixture.

15 - REGULATIONS

This Safety Data Sheet conforms to ANSI Z400.5, and to the format requirements and the International Chemical Safety Cards of the Global Harmonizing System. This SDS complies with 29 CFR 1910.1200 (HAZARD COMMUNICATION STANDARD). **IMPORTANT:** Read this SDS before handling & disposing of this product. Pass this information on to employees, customers, & users of this product.

EPA SRA Title III Chemical Listings:

TSCA STATUS: ..... This product is listed on the TSCA inventory. If this product is a blend, all ingredients in the product are listed on the TSCA Inventory List. Any impurities present in this product are exempt from listing.
SECTION 302: ..... None
SECTION 304: ..... None
SECTION 312: Yes
SARA SECTION 313: **SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372):** This product contains toxic chemicals subject to the reporting requirements of Section 313, Title III of the SARA (Superfund Amendments and Reauthorization Act) of 1986: Sodium Hydroxide (Caustic Soda)
ACUTE: ..... Yes
CHRONIC: ..... Yes
FIRE: ..... No
PRESSURE: ..... No
REACTIVE: ..... Yes
CLEAN WATER ACT: ..... None

IMDG – International Marine Dangerous Goods Code
UN1824, Sodium Hydroxide, Solution, 8, PG II. EmS F-A, S-B. Marine Pollutant: No.
IATA
UN1824, Sodium Hydroxide, Solution, 8, PG II

DEA Chemical Trafficking Act: .. No

16 – OTHER INFORMATION

HMIS*

HEALTH	3
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	H

HMIS®HAZARD INDEX: 0=Minimal Hazard, 1=Slight Hazard, 2=Moderate Hazard, 3=Serious Hazard, 4=Severe Hazard.
HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this SDS and product label must be considered.

ND = No Data, NA = Not Applicable/Not Available, ≤ = Less than or equal to, ≥ = Greater than or equal to

REVISION STATEMENT: Changes have been made throughout this Safety Data Sheet (SDS). Please read the entire document. Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) by the Company Health and Risk Assessment Unit.

DISCLAIMER:
Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, the Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving this Safety Data Sheet (SDS) will make their own determination as to its suitability for their intended purposes prior to use. Since the product is within the exclusive control of the user, it is the user's obligation to determine the conditions of safe use of this product. Such conditions should comply with all Federal and State Regulations concerning the Product. It must be recognized that the physical and chemical properties of any product may not be fully understood and that new, possibly hazardous products may arise from reactions between chemicals. The information given in this data sheet is based on our present knowledge and shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.**

*****This is the last page of this SDS*****