MSDS CAUSTIC SODA SOLUTION

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: SODIUM HYDROXIDE, LIQUID (L-NaOH)
RECOMMENDED USAGE: Neutralizing agent, industrial cleaner, pulping and bleaching, catalyst, Splash risk

MANUFACTURER:
COMPANY INFORMATION Saudi Factory for Chlorine & Alkalies
Building #2101, Unit # 2, Riyadh 14545-8762, Kingdom of Saudi Arabia.
Contact # +966 11 810 1219 Email: Info@sachlo.com
EMERGENCY CONTACT DETAILS: +966554066597 +966550289633

SECTION 2: COMPOSITION, INFORMATION & SPECIFICATIONS

Synonyms: Caustic soda Solution; sodium hydroxide Liquid; sodium hydrate 50% Solution
CAS No.: 1310-73-2
Molecular Weight: 40.00
Chemical Formula: NaOH

Sr. #	Parameters	Unit	Limits
1	NaOH	%	50.5 ±1
2	Na_2CO_3	%	< 0.20 Max
3	Na_2SO_4	PPM	< 30.0 Max
4	NaCl	PPM	< 50.0 Max
5	$NaClO_3$	PPM	< 20.0 Max
6	Ni	PPM	< 2.0 Max
7	Iron	PPM	< 5.0 Max
8	Appearance	NA	Colorless

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview:
DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES SEVERE SKIN BURNS AND EYE DAMAGE (H314). REACTS WITH WATER, ACIDS, AND OTHER MATERIALS.

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GHS (GLOBAL HARMONIZED SYSTEM) LABELING FOR CAUSTIC SODA SOLUTION:

Corrosive

Health Hazard

Code	Word	Hazard Statement
H314	Danger	Causes severe skin burns and eye damage.
H318	Danger	Causes serious eye damage
H290	Warning	May be corrosive to Metal.

GHS Precautionary Statements:

Prevention:

- P260 – Do not breathe mist/vapors. *(New)*
- P264 – Wash skin thoroughly after handling. *(New)*
- P280 – Wear protective gloves/clothing/eye/face protection. *(Existing)*
- P284 – Wear respiratory protection. *(New, if airborne risk exists)*

Response (First Aid):

- P301 + P330 + P331 – If swallowed: Rinse mouth. Do NOT induce vomiting. *(Existing)*
- P303 + P361 + P353 – If on skin: Remove clothing, rinse immediately. *(New, critical for NaOH)*
- P305 + P351 + P338 – If in eyes: Rinse cautiously, remove contacts. *(Existing)*
- P310 – Call poison center/doctor. *(Existing)*

Storage/Disposal:

- P405 – Store locked up. *(New, often required for corrosives)*
- P501 – Dispose per local regulations. *(New, ensures compliance)*

NFPA Rating:

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Moderate
(per NFPA 2022 revisions).
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

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Note: NFPA ratings are provided for informational purposes. GHS classification takes precedence for compliance.

Potential Health Effects

Inhalation:

Severe irritant. Effects from inhalation of dust or mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Severe pneumonitis may occur.

Ingestion:

Corrosive! Swallowing may cause severe burns of mouth, throat, and stomach. Severe scarring of tissue and death may result. Symptoms may include bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appear days after exposure.

Skin Contact:

Corrosive! Contact with skin can cause irritation or severe burns and scarring with greater exposures.

Eye Contact:

Corrosive! Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.

Chronic Exposure:

Prolonged contact with dilute solutions or dust has a destructive effect upon tissue.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

SECTION 4: FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention. Symptoms may include sneezing, sore throat, coughing, difficulty breathing, or severe pneumonitis (lung inflammation).

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes. Rinse with **copious water** (15+ mins); neutralize with weak acid (e.g., vinegar) if available. Symptoms include severe burns, pain, redness, blistering, or white eschars (dead tissue).

EYE CONTACT: For eye exposure, immediately use ANSI-compliant eye wash stations (15+ minutes flushing). Seek medical attention even if symptoms are delayed.

INGESTION: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention. Symptoms include burning sensation in mouth/throat, vomiting (possibly bloody), abdominal pain, shock, or esophageal perforation.

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SECTION 5: FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam
Large fires: Use regular foam or flood with fine water spray.
FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.
FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES:
ENVIRONMENT PRECAUTION:
SOIL RELEASE: Dig holding area such as lagoon, pond or pit for containment. Cover with plastic sheet or tarp to minimize spreading and protect from contact with water.
WATER RELEASE: Neutralize.
METHODS & MATERIALS FOR CONTAINMENT & CLEANING UP
Do not touch spilled material. Stop leak if possible without personal risk.
Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal.
Small dry spills: Move containers away from spill to a safe area.
Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304).

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING:
Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Transfer solids using tools or equipment, which are corrosion - resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container. Considerable heat is generated when diluted with water. Proper handling procedures must be followed to prevent vigorous boiling, splattering or violent eruption of the diluted solution. Never add water to caustic. **ALWAYS ADD CAUSTIC TO WATER** and provide agitation. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. In general, keep solid sodium hydroxide away from water. Post “DO NOT USE WATER” signs in area of use to prevent accidental contact.
PRECAUTIONS FOR SAFE STORAGE (including any incompatibilities):
Store in a cool, dry, well-ventilated area. This material absorbs water. Keep containers tightly closed when not in use and when empty. Protect from damage. Store away from incompatible materials such as strong acids, nitroaromatic,

nitroparaffin Nic or organ halogen compounds. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of nickel alloys are preferred. Steel containers are acceptable if temperatures are not elevated. Nickel is the preferred metal for handling this product. Plastics or plastic-lined steel, or FRP tanks of dracaena vinyl ester resin may be suitable. If outdoor storage of pearl caustic is unavailable, the pallets should be protected against extremes of weather. Do not expose sealed containers to temperatures above 40°C (104°F)

SHELF LIFE: If properly stored, it has an infinite shelf-life & will remain intact until it is reacted with other materials.

SOLUTION STABILITY: Avoid freezing; store at 15–30°C to prevent crystallization.

SECTION 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

CONTROL PARAMETERS:

Regulatory Agency / Standard	Exposure Limit	Notes
OSHA PEL (29 CFR 1910.1000)	2 mg/m³ (Ceiling)	Do not exceed at any time. Vacated by 58 FR 35338 (June 30, 1993).
ACGIH TLV (2024)	2 mg/m³ (Ceiling)	Ceiling limit (not to be exceeded).
NIOSH REL	2 mg/m³ (Ceiling)	Avoid skin & eye contact.
UK OES STEL	2 mg/m³ (STEL)	Short-term exposure limit (15-min average).

MEASUREMENT METHOD: Particulate filter; Hydrochloric acid; Titrate; NIOSHIV # 7401, Alkaline Dusts

APPROPRIATE ENGINEERING CONTROLS:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact.

VENTILATION: Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQIPMENT

Maintain eye wash fountain and quick-drench facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.

EYE PROTECTION: Wear full face-shield and chemical safety goggles when there is potential for contact.

Skin Protection: Wear appropriate personal protective clothing to prevent skin contact. Chemical protective clothing composed of natural rubber, neoprene, nitrile, or styrene/butadiene (SBR)-coated fabric is highly recommended, having break through times greater than one hour. Butyl rubber, polyethylene, chlorinated polyurethane, or polyvinyl alcohol may be used but data suggests breakthrough times of approximately an hour or more.

RESPIRATORY PROTECTION:

Up To 10 mg/m3: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full-face piece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter, Eye protection needed; or full-face piece; SCBA.

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: LIQUID
COLOR: Colorless
CHANGE IN APPEARANCE: hygroscopic.
ODOR: odorless
ODOR THRESHOLD: Not available
MOLECULAR FORMULA: NaOH
MOLECULAR WEIGHT: 40.00
ODOR: No appreciable odor
APPEARANCE: Clear to Opaque
AUTOIGNITION TEMPERATURE: Not applicable
BOILING POINT: Approx. 145 °C (293 °F)
COEFFICIENT OF OIL / WATER: Not applicable
EVAPORATION RATE: (butyl acetate = 1) Not available
FLASH POINT: Non-combustible
FREEZING POINT: 5 – 12 °C
ODOR THRESHOLD: Not applicable
OXIDIZING PROPERTIES: Not available
PERCENT VOLATILE: Not applicable
pH: 14 (7.4 % Solution)
SOLUBILITY IN WATER: Infinite
SPECIFIC GRAVITY: 1.53 @ 15.5°C (60°F) (water = 1)
VAPOR DENSITY: Not Available
VAPOR PRESSURE: 10 mm Hg @ 55°C

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at room temperature. Rapidly absorbs carbon dioxide from the air, forming. sodium carbonate. Slowly absorbs moisture from the air.
POSSIBILITY OF HAZARDOUS REACTIONS:
REACTIVITY: May react with evolution of heat on contact with water.
CONDITIONS TO AVOID: Water, moisture, and air. Dangerous gases may accumulate in confined spaces.

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May ignite or explode on contact with combustible materials.
INCOMPATIBILITIES: combustible materials, acids, halo carbons, metals, halogens, oxidizing materials, peroxides, metal salts
HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition; SODIUM OXIDE
POLYMERIZATION: Will not polymerize. However, it can induce hazardous polymerization of acetaldehyde, acrolein and acrylonitrile.

SECTION 11: TOXICOLOGICAL INFORMATION

IRRITATION DATA:
1 percent/24-hour(s) eyes-monkey severe; 500 mg/24 hour(s) skin-rabbit severe; 400 ug eyes-rabbit mild; 1 percent eyes-rabbit severe; 50 ug/24hour(s) eyes-rabbit severe; 1 mg/24 hour(s) eyes-rabbit severe; 1 mg/30second(s) rinsed eyes-rabbit severe.
TOXICITY DATA:
1350 mg/kg skin-rabbit LD50; 104-340 mg/kg oral-rat LD50; 40 mg/kg intra peritoneal-mouse LD50; 500 mg/kg Oral-rabbit LDLo
LOCAL EFFECTS:
Corrosive: inhalation, skin, eye, ingestion
ACUTE TOXICITY LEVEL:
Toxic: ingestion
Moderately Toxic: dermal absorption
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
eye disorders, skin disorders and allergies
MUTAGENIC DATA:
Cytogenetic analysis - grasshopper parenteral 20 mg; cytogenetic analysis hamster lung 10 mmol/L; Cytogenetic analysis - hamster ovary 16 mmol/L
Inhalation Exposure
Acute Effects:
Low concentrations (≥2 mg/m³) cause **respiratory irritation** (coughing, sore throat, shortness of breath).
High concentrations may lead to **severe pneumonitis, pulmonary edema**, or **respiratory failure** due to corrosive damage to airways.
Delayed symptoms (e.g., lung swelling) can appear hours after exposure.
Chronic Effects:
Prolonged exposure to mist/dust may cause **nasal septum ulceration** and **chronic bronchitis**.
Animal data: Repeated exposure to aerosols caused **lung damage** (fibrosis, emphysema) in rats.
Ingestion Exposure
Acute Effects:
Corrosive! Swallowing even small amounts (≥5g in humans) causes **severe burns** to mouth, esophagus, and stomach.
Symptoms: **Vomiting (bloody), shock, perforation of digestive tract, and potential death**.

Long-term complications: **Esophageal strictures** (scarring) may develop weeks/years later, leading to swallowing difficulties.

Chronic Effects:

Repeated ingestion (even dilute solutions) may cause **chronic inflammation, ulcers, or strictures**.

Not a carcinogen, but severe burns may increase cancer risk due to tissue damage (per IARC/ACGIH).

Skin Contact

Acute Effects:

Severe burns (even at 0.12% concentration); pain may be delayed.

Concentrations ≥5% cause **rapid skin necrosis** (white, soft eschars).

Dissolves skin proteins, leading to **deep ulcers** if not rinsed immediately.

Chronic Effects:

Repeated exposure causes **dermatitis, cracking, or chronic ulcers**.

Eye Contact

Acute Effects:

Permanent damage/blindness possible.

Immediate symptoms: **Pain, redness, corneal opacity, eyelid swelling**.

Severe exposures: **Corneal perforation, symblepharon (fused eyelids)**.

Chronic Effects:

Repeated low-level exposure may cause **chronic conjunctivitis**.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY:

FISH TOXICITY: 240 ug/L 96-hour(s) LC50 (Mortality) Bluegill (Lepomismacrochirus)

INVERTEBRATE TOXICITY: 330000-1000000 ug/L 48-hour(s) LC50 (Mortality) Cockle (Cerastoderma edule)

ALGAL TOXICITY: 765 ug/L 30-day(s) (Biomass) Algae, phytoplankton, algal mat (Algae)

PHYTOTOXICITY: 230 ug/L 21-week(s) (Biomass) Waterweed (Elodea Canadensis)

FATE AND TRANSPORT:

BIOCONCENTRATION:

1066 ug/L 32-hour(s) BCF (Residue) Fathead minnow (Pimephales promelas) 3.1 ug/L

ENVIRONMENTAL SUMMARY: Highly toxic to aquatic life.

SECTION 13: DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal. Do not dispose of waste with normal garbage, or to sewer systems. Whatever cannot be saved for recovery or recycling, including containers, should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. Dispose per *Saudi Waste Management Center (SWMC) Hazardous Waste Regulations* (No. M/50, 2019).

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SECTION 14: TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Sodium hydroxide, solution
ID NUMBER: UN1824
HAZARD CLASS OR DIVISION: 8
PACKING GROUP: II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Sodium hydroxide, solution
UN NUMBER: UN1824
ADR/RID CLASS: 8
CLASSIFICATION CODE: C6
PACKING GROUP: II

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Sodium hydroxide, solution
UN/ID NUMBER: UN1824
IATA/ICAO CLASS: 8
PACKING GROUP: II

MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Sodium hydroxide, solution
UN NUMBER: UN1824
IMDG CLASS: 8
PACKING GROUP: II
EMS No: F-A, S-B
Limited Quantity: Not permitted.
Marine Pollutant: No
PIH Code: Not applicable.

SECTION 15: REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): 1000 LBS RQ
SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.
SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.
SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: No

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REACTIVE: Yes
SUDDEN RELEASE: No
SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.
OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.
CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: Class E: Corrosive
EUROPEAN REGULATIONS:
EC CLASSIFICATION (ASSIGNED): C Corrosive
EC Classification may be inconsistent with independently researched data.
DANGER/HAZARD SYMBOL:
C Corrosive
EC RISK AND SAFETY PHRASES:
R 35 Causes severe burns.
S ½ Keep locked-up and out of reach of children.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
CONCENTRATION LIMITS:
C>=5% C R 35
2%<=C<5% C R 34
0.5%<=C<2% Xi R 36/38
GERMAN REGULATIONS:
WATER HAZARD CLASS (WGK):
STATE OF CLASSIFICATION: VwVwS
CLASSIFICATION UNDER HAZARD TO WATER: 1
NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.
TSCA 12(b) EXPORT NOTIFICATION: Not listed.

SECTION 16: OTHER INFORMATION

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