# MATERIAL SAFETY DATA SHEET

## Section 1 Product Identification

**Product Name:** Sodium Hydroxide Solution 50%, Commercial Grade

**Synonyms:** Caustic Soda, Soda Lye, Sodium Hydrate **Product Code:** NAOH50

**Product Uses:** Inorganic and organic chemistry industry; alumina production; soap and surfactants; textile industry; oil and gas processing; rayon industry; pulp and paper industry; food industry; water treatment; agricultural industry & metal finishing industry.

**Issue Date:** 2/11/05 **Superceded Date:** 3/23/04

## Section 2 Hazards Identification

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**Emergency Overview**

Colorless Odorless Liquid

Extremely Corrosive! Contact can cause eye burns and permanent tissue damage. May be fatal if swallowed. The severity of damage depends on the concentration of the caustic and the duration of the exposure. Reactive with water and numerous commonly encountered materials, generating heat. Contact with some metals releases flammable hydrogen gas.

Highly toxic to fish and other water organisms.

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**Potential Health Effects:** See Section 11 for more information.

**Likely Routes of Exposure:** Eye and Skin Contact.

**Eye:** Eye contact of only a few seconds can cause permanent damage, even blindness.

**Skin:** Contact may produce severe irritation or corrosive skin damage, depending on the length of contact, amount of caustic and concentration.

**Inhalation:** Inhalation of caustic aerosols including mists, vapors, gas, fog and other airborne forms of any particle size causes irritation to destructive burns of the upper respiratory tract. High or prolonged inhalation exposure may lead to corrosion of mucous membranes and pneumonitis. Fatality may occur from gross exposure.

**Ingestion:** Ingestion may cause severe caustic burns to the mouth, throat,

esophagus, and stomach. Gross ingestion my cause death. Severe scarring of the throat may occur on recovery. Symptoms may include bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appear days after exposure.

This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC, or NTP.

This material meets the definition of corrosive as defined in OSHA's Hazard Communication Standard (29 CFR 1910.1200).

**Potential Environmental Effects:** Extremely toxic to aquatic life on a acute basis.

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**Section 3 Composition/Information on Ingredients**

| **Component** | **CAS#** | **%(by weight)** |
|---|---|---|
| Sodium hydroxide | 1310-73-2 | 48.5-52.0 |
| Sodium chloride | 7647-14-5 | ≤ 1.2 |
| Sodium chlorate | 7775-09-9 | ≤ 0.4 |
| Sodium carbonate | 497-19-8 | ≤ 0.2 |
| Sodium sulfate | 7757-82-6 | ≤ 0.1 |
| Iron | 7439-89-6 | ≤ 10 ppm |
| Water | 7732-18-5 | Balance |

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**Section 4 First Aid Measures**

**Eyes:** Immediately flush eyes with water for at least 15 minutes, lifting eyelids to thoroughly flush. **Do Not** try to neutralize the caustic. **Contact Physician immediately.** (Contact physician during flushing process expedites process). Apply cool packs on eyes while transporting victim to medical facility.

**Skin:** Immediately flush affected area with water for at least 15 minutes, removing all contaminated clothing while flushing. **Contact Physician immediately** (contact during flushing process expedites process). Keep affected area cool.

**Inhalation:** Remove to fresh air. **Contact Physician immediately.** Check for breathing and pulse. If breathing is difficult, give Oxygen (6 liters per minute). If breathing has stopped, give artificial respiration. Keep victim warm and at rest.

**Ingestion: DO NOT INDUCE VOMITING. Contact Physician immediately.** Give large quantities of water **only** if the victim is conscious. Keep victim warm and at rest.

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**Notes to Physician**

**Eye and Skin:** Treat symptomatically.

**Inhalation:** Individuals with pre-existing lung conditions may have increased susceptibility to the toxicity of excessive exposure.

**Ingestion:** Perform Endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the uses of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes and fluid intake are also required.
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## Section 5 Fire Fighting Measures

**Extinguishing Media:** Use extinguishing media compatible with caustic and appropriate for the burning fire, such as foam, carbon dioxide or dry chemicals. Avoid water use if possible.

**Hazardous Combustion Products:** May generate sodium oxide fumes.

**Fire Fighting Instructions:** Keep personnel removed and upwind of fire. Remove or isolate material not involved in the fire if it can be done without risk. Use water spray to cool containers and control vapors. Runoff from fire control may cause pollution. Neutralize with dilute acetic or hydrochloric acid. For potential exposure to caustic fumes, wear full protective clothing with hood and breathing air supply.

## Section 6 Accidental Release Measures

**Reportable Quantity (RQ) ≥ 156 Gallons of 50% NaOH Solution**

**Personal Precautions:** Use personal protection recommended in Section 8.

**Land Spill:** Evacuate personnel. Keep upwind of released material. Wear proper personal protective clothing. Respiratory protection is required where vapors are present. Stop leak at source. Contain released material to stop spreading. Reclaim material if possible. Pump to non-metallic container. Neutralize remaining material and surfaces with dilute acetic or hydrochloric acid. Direct wash water to local sanitary sewer if permissible.

**Water Spill:** Material is extremely toxic to aquatic life on an acute basis. If water is isolated or can be contained, neutralize with dilute acetic or hydrochloric acid.

***IN All INSTANCES, NOTIFY APPROPRIATE AUTHORITIES IF REQUIRED BY REGULATIONS.***

## Section 7 Handling and Storage

**Exposure Guidelines:**

Sodium Hydroxide solutions- PEL (OSHA): 2 mg/m3, ceiling
TLV (ACGIH): 2 mg/m3, ceiling
IDLH (NIOSH): 10mg/m3

**Engineering Controls:** Provide general and/or local exhaust ventilation to control airborne concentrations below recommended exposure guidelines.

**Eye/Face Protection:** Contact lenses should not be worn; they could contribute to severe eye damage. Wear close fitting chemical splash goggles as a minimum. Where splash hazard to face is present, also wear full-length transparent face shield.

**Skin Protection:** Use protective clothing impervious to caustic such as neoprene or polyvinyl chloride (PVC). Use precautions to ensure all potentially affected body parts are covered such as taping sleeves and pant legs to gloves and boots, respectively, and buttoning clothing to the neck. Selection of specific items such as gloves, coats, pants boots, aprons, or full-body suits will depend on operations to be performed. Avoid leather and wool. Safety shower should be located in the immediate work area.

**Respiratory Protection:** When exposure levels could exceed 2 mg/m3, a NIOSH approved air-purifying full-face respirator with high efficiency particulate filters is recommended. When exposure levels could exceed 10 mg/m3, self-contained breathing apparatus with full face piece is recommended.

**General Hygiene Considerations:** Follow good industrial hygiene practices including but not limited to: (1) avoid breathing vapors; (2) wear appropriate safety equipment; (3) launder contaminated clothing before reuse; (4) wash thoroughly before handling.

## Section 9 Physical and Chemical Properties

**Appearance:** Cloudy to water clear **Odor:** none

**Physical State:** Liquid **pH:** 14 SU **Solubility** (in H20): 100%

**Molecular Formula:** NaOH **Molecular Weight:** 40.0 (dry basis)

**Percent Volatile:** wt%: < 50% **Flammability**: non-flammable

**Evaporation Rate** (Butyl Acetate =1): ~0

**Specific Gravity** (water = 1): 1.53

**Boiling Point** (water=212 dg F): 293 dg F (145 dg C)

**Vapor Pressure:** 1.5 mmHg @ 68 dg F (20 dg C)

**Freezing Point** (water = 32 dg F): 54 dg F (12 dg C)

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## Section 10 Stability and Reactivity

**Stability:** Normally stable. Sodium hydroxide rapidly absorbs carbon dioxide from the air forming sodium carbonate.

**Conditions to avoid:** Keep away from heat, sparks or flames. **Do Not** store or mix with incompatible materials.

**Incompatible materials:** Incompatible with water, acids, flammable liquids, organic halogens, metals such as aluminum, tin and zinc, nitro methane. Corrosive to metals. Contact to some metals can generate hydrogen gas. Contact with water may generate sufficient heat to ignite combustible materials. Carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death.

**Hazardous Decomposition Products:** Does not decompose.

**Hazardous Polymerization:** Will not occur.

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## Section 11 Toxicological Information

**Reported Human Effects:** Full destruction of tissue with prolonged contact.

**Reported Animal Effects:**

Oral - $LD_{50}$ (rabbit) is 500 mg/kg @ 100% NaOH
Dermal - $LD_{50}$ (rabbit) is 1359 mg/kg @ 100% NaOH

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## Section 12 Ecological Information

**Ecotoxicity:** Highly toxic to fish and other water organisms due to likely rise in water pH and/or heat generation.

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## Section 13 Disposal Considerations

If this product as supplied becomes waste, it meets the criteria of a hazardous waste (corrosivity, EPA Hazardous waste # D002) as defined under the

Resource Conservation and Recovery Act (RCRA), 40 CFR Part 261. Dispose of in accordance with local State and Federal laws and regulations.

## Section 14 Transportation Information

**Shipment in the U.S.A. (DOT) and by water (IMO):**

Proper shipping name: Sodium hydroxide solution

Hazard Class: 8 (Corrosive) Identification # : UN1824

Packing Group: II

**Shipment by air (ICAO & IATA):** Cargo aircraft qty. limitations- 30L

## Section 15 Regulatory Information

**OSHA:** This product is classified as corrosive by definition of Hazard Communication Standard (29 CFR 1910. 1200).

**U.S. EPA:** If this product as supplied becomes waste, it meets the criteria of a hazardous waste (corrosivity, EPA hazardous waste # D002) as defined under the Resource Conservation and Recovery Act (RCRA), 40 CFR Part 261.

**TSCA:** All chemical substances in this product are listed in U.S. TSCA Section 8(b) Inventory.

**Consumer Product Safety Commission:** Specially regulated substance. Add POISON to label (16 CFR 1500.129).

**CERCLA (RQ):** This product is a hazardous substance listed in 40 CFR Part 302. The current Reportable QTY (RQ) for anhydrous sodium hydroxide is 1000 pounds.

**SARA Title III:** Section 311/312 Hazard Class- Immediate (Acute) health hazard, reactive hazard. This product does not contain any toxic chemicals subject to the reporting requirements of section 313 (40 CFR Part 372).

**California Proposition 65:** This product may contain one or more chemicals in trace quantities know to the State of California to cause cancer or reproductive toxicity as listed under the Safe Drinking Water and Toxic Enforcement Act of 1986.

**CAL/OSHA** exposure limits - 8ug/$m^3$ REL; 2 mg/$m^3$ PEL and Ceiling.

**CAL/EPA:** ADOA - 2 lbs/yr; Category llb air contaminant.

**Connecticut:** Hazardous Air Pollutants- 200 ug/$m^3$ HLV (30-min); 40 ug/$m^3$

HLV (8-hr).

**Idaho:** Limits for air contaminants - 2 mg/$m^3$, TWA

**New Jersey:** Department of Health RTK List - sn 1706. Special Hazardous Substances - Corrosive.

**New York:** Reporting of Releases Part 597 - Air RQ = 1000 lbs; Land/Water RQ = 100 lbs.

**Pennsylvania:** Right-To-Know List - Environmental Hazard.

**Rhode Island:** Hazardous Substance List - Toxic, Flammable

**Tennessee:** Hazardous Right-To-Know Ceiling - 2mg/$m^3$

**Vermont:** Permissible exposure limit- 2 mg/$m^3$ Ceiling

**Washington:** Permissible exposure limit - 2 mg/$m^3$ Ceiling

**Wisconsin:** Table 4 HAPs with acceptable Ambient Concentrations- less than 25 feet is 0.1008 ( c ) lbs/hr; greater than 25 feet is 0.384 ( c ) lbs/hr.

**Canada (Alberta, British Columbia, New Brunswick, Ontario, Quebec, Saskatchewan, Yukon):** Exposure limits - 2 mg/$m^3$ Ceiling.

**Canada - CEPA:** All components of this product are on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.

**Mexico Instruction No. 10:** TWA-2 mg/$m^3$; Skin designation- potential for cutaneous absorption.

**Inventories:** Australian Inventory of Chemical Substances; China; European Inventory of Existing Commercial Chemical Substances (215-185-5); EU Inventory of Cosmetic Ingredients (INCI); Japan Existing and New Chemical Substances (1-410); Korea Existing and Evaluated Chemical Substances (KE-31487); Philippines Inventory of Chemicals.

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## Section 16 Other Information

**HMIS ® Rating:** Health - 3; Flammability - 0; Physical Hazard - 2

**NFPA Rating:** Health - 3; Flammability - 0; Reactivity -1
Special Precautions - Corrosive

(0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard)

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**DISCLAIMER**

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