Material Safety Data Sheet

Product: Sodium Hydroxide
Cas No.: 1310-73-2
MSDS No.: 9135       Review Date: November 7, 2008

For Emergency Assistance, please call CANUTEC (613) 996-6666 COLLECT

Section 1: Product and Company Identification

Trade Name / Chemical Name: Sodium Hydroxide
Synonyms: Caustic soda; Soda lye; Sodium hydroxide solid; Sodium hydrate
Molecular Formula: NaOH
Molecular Weight: 40.00
Chemical Family: Inorganic Compounds
Company Identification: ASLCHEM INTERNATIONAL INC.
#1260-4871 Shell Road,
Richmond, B.C. Canada V6X 3Z6
For Product Information: (604) 273-8882

Section 2: Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Ingredients</th>
<th>%</th>
<th>(ACGIH)T.L.V.</th>
<th>(OSHA)PEL</th>
<th>CAS No.</th>
<th>Route, Species: LD 50 (Oral, Rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>99%</td>
<td>2 mg/m3 Ceiling</td>
<td>2 mg/m3 Ceiling</td>
<td>1310-73-2</td>
<td>500 mg/kg (10% Solution)</td>
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</tbody>
</table>

Section 3: Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS.

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 appears 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:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

**Ingestion:** DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:** Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.

**Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:** Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use 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.

Section 5: Fire Fighting Measures

**Flash Point & Method:** N/AV

**Flammable Limits (% by vol. In air):** None

<table>
<thead>
<tr>
<th>Lower</th>
<th>Higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/AV</td>
<td>N/AV</td>
</tr>
</tbody>
</table>

**Fire Extinguishing Media:** Use Carbon dioxide (CO2), Dry chemicals, Foam or any means suitable for extinguishing surrounding fire. Adding water to caustic solution generates large amounts of heat.

**Special protective equipment for fire-fighters**

Wear self-contained breathing apparatus for fire fighting if necessary.

**Unusual fire & explosion hazards:**

Upon contact with certain metals and water or moist air, hydrogen gas is generated, forming explosive mixtures with air.

**Hazardous combustion products:**

Irritating gases/vapors/fumes.

Section 6: Accidental Release Measures

**Personal precautions**

Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas.

**Environmental precautions**

Do not let product enter drains.

**Methods for cleaning up**

Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

Section 7: Handling and Storage

**Handling:**

Wash thoroughly after handling. Do not allow water to get into the container as it will cause violent reaction. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Discard contaminated shoes. Use only with adequate ventilation.

**Storage:**

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from metals. Corrosives area. Keep away from acids. Store protected from moisture. Containers must be tightly closed to prevent the conversion of NaOH to sodium carbonate by CO2 in air.
**Section 8: Exposure Controls/Personal Protection**

**Engineering Controls:**
Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

**Ventilation:** Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

**Respirators:** Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.

**Protective Gloves:**
Use gauntlet type rubber gloves.

**Eye Protection:**
Use tight fitting goggles if dust is generated. Wear splash-proof eye goggles to prevent any possibility of eye contact.

**Protective Clothing:**
Wear appropriate clothing to prevent any possibility of skin contact. Provide eyewash station and safety shower.

**Hygienic Work Practices:**
Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

**Exposure Limits:** ACGIH TLV = 2mg/m³

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV-TWA</th>
<th>OSHA PEL-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>2mg/m³</td>
<td>2mg/m³</td>
</tr>
</tbody>
</table>

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**Section 9: Physical and Chemical Properties**

**Appearance & Odour:** White, deliquescent pellets or flakes. Odorless.

**Specific Gravity:** 2.13  
**Boiling Point (Deg C):** 1390°C (2534°F)

**Vapour Density (Air=1):** more than 1  
**Melting Point (Deg C):** 318°C (604°F)

**Percent Volatile by Volume (%):** 0  
**Evaporation Rate:** N/AV

**Solubility in Water (%WW):** 111 g/100 g of water.  
**pH:** 13 - 14 (0.5% solution.)

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**Section 10: Stability and Reactivity**

**Stability:**  
Stable **X**  
Unstable **☐**

**Conditions to Avoid:** Moisture, dusting and incompatibles.

**Incompatibility (Materials to avoid):** Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may causes 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 Decomposition Products:** Sodium oxide. Decomposition by reaction with certain metals releases flammable and explosive hydrogen gas.

**Reactivity Data:** Stable under ordinary conditions of use and storage. Very hygroscopic. Can slowly pick up moisture from air and react with carbon dioxide from air to form sodium carbonate.

**Hazardous Polymerization:**
May occur **☐**  
Will not occur **X**
Section 11: Toxicological Information

Acute toxicity: Dermal: LD50, rabbit, 500 mg/kg.
Chronic toxicity:
- Inhalation, acute and repeated exposure, rat, target organ: respiratory system, corrosive effect.
- Oral route, after repeated exposure, rat, target organ: gastro-intestinal system, corrosive effect.
- In vitro, no mutagenic effect.
- Prolonged exposure to high concentrations can cause ulceration of nasal passages and lung irritation.
Carcinogenic Designation: None listed.

Section 12: Ecological Information

Acute aquatic toxicity:
LC 50, 96 HRS, FISH, mg/l: 125 (Mosquitofish)
EC 50, 48 HRS, DAPHNIA, mg/l: 100

This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information. This product is approved for use under the U.S. Environmental Protection Agency (EPA) Region IX (California) General NPDES Permit which regulates offshore discharges of drilling fluids. Contact M-I's Environmental Affairs Department for more information.

Chronic ecotoxicity: No data.

Mobility:
- Air: Instantaneous degradation.
- Water: Considerable solubility and mobility.
- Soil/sediments: Considerable solubility and mobility.
- Soil/sediments: Groundwater contamination if raining.

Degradation Abiotic:
- Air, neutralization (atmospheric CO2), t1/2=13 seconds. Degradation products: sodium carbonate (aerosol).
- Water, Instantaneous ionization with pH increase.
- Soil, ionization/neutralization.

Biotic: No data.

Potential for bioaccumulation: None.

Other adverse effects /Comments: Harmful for aquatic organisms due to alkaline pH. Diluted product is rapidly neutralized at environmental pH.

Section 13: Disposal Considerations

Waste management:
This product, should it become a waste, is hazardous according to U.S. RCRA criteria. Container may be hazardous when empty as it retains residues. All labeled precautions must be observed.

Disposal methods:
Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill. Observe state, federal regulations.
Section 14: Transportation Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SODIUM HYDROXIDE, SOLID
Hazard Class: 8
UN/NA: UN1823
Packing Group: II
Information reported for product/size: 300LB

International (Water, I.M.O.)

Proper Shipping Name: SODIUM HYDROXIDE, SOLID
Hazard Class: 8
UN/NA: UN1823
Packing Group: II
Information reported for product/size: 300LB

IATA

Proper shipping name: SODIUM HYDROXIDE, SOLID
Hazard Class: 8
UN/NA: UN1823
Packing group: II

Section 15: Regulatory Information

Regulatory status of ingredients:

<table>
<thead>
<tr>
<th>CAS No</th>
<th>TSCA</th>
<th>CERCLA</th>
<th>SARA 302</th>
<th>SARA 313</th>
<th>DSL(CAN)</th>
<th>NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310-73-2</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Sodium hydroxide</td>
</tr>
</tbody>
</table>

US Federal Regulations:


Regulatory status: This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented): SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:
1: Immediate (Acute) Health Effects.
5. Reactivity Hazard.
The components of this product are listed on or are exempt from the following international chemical registries:
TSCA (U.S.)
DSL (Canada)

State Regulations:

State Regulatory Status: This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):
Illinois Right-to-Know.
New Jersey Right-to-Know.
Pennsylvania Right-to-Know.

PROPOSITION 65: This product does not contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required.

Canadian Regulations:

LABELS FOR SUPPLY:

(To be Continued)
Section 15: Regulatory Information (Continued)

**Regulatory status:** This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

**Canadian WHMIS Classification:**
E - Corrosive Material D2B - Other Toxic Effects: Toxic Material

Section 16. Other Information

Information contained herein is provided without any warranty, and Aslchem International will not be liable for any damage which may result from the use or reliance on any information contained herein.