# Safety Data Sheet

**Material Name:** Sodium Hydroxide (Caustic Soda)

**ID:** C1-142

## Section 1 - Chemical Product and Company Identification

**Part Number:** Technical Flake, Micropearls, and Beads  
**Chemical Name:** Sodium Hydroxide (Caustic Soda)  
**Product Use:** For Commercial Use

### RESTRICTIONS on USE

*NOT TO BE USED AS A PESTICIDE. THIS PRODUCT IS NOT TO BE USED IN VIOLATION OF ANY PATENTS. CHEM ONE LTD. DISCLAIMS ANY AND ALL WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR APPLICATION. IN NO EVENT SHALL CHEM ONE LTD. OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES WHATSOEVER INCLUDING DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, LOSS OF BUSINESS PROFITS OR SPECIAL DAMAGES, EVEN IF CHEM ONE LTD. OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME STATES DO NOT ALLOW THE EXCLUSION OF LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES SO THE FOREGOING LIMITATION MAY NOT APPLY.*

### Supplier Information

Chem One Ltd.  
14140 Westfair East Drive  
Houston, Texas 77041-1104  
Phone: (713) 896-9966  
Fax: (713) 896-7540  
Emergency # (800) 424-9300 or +1 (703) 527-3887

**NOTE:** Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

## Section 2 - Composition / Information on Ingredients

### GHS HAZARDS

<table>
<thead>
<tr>
<th>Hazard Classes</th>
<th>Hazard Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosive to metal</td>
<td>Category 1</td>
</tr>
<tr>
<td>Acute toxicity, oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion</td>
<td>Category 1A</td>
</tr>
<tr>
<td>Serious eye damage</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

**Signal Word:** Danger

**Pictograms:**

### Hazard Statements

**PHYSICAL HAZARDS:**  
H290: May be corrosive to metals

**HEALTH HAZARDS:**  
H302: Harmful if swallowed  
H314: Causes severe skin burns and eye damage  
H318: Serious eye damage

**ENVIRONMENTAL HAZARDS:**  
None

Issue Date: 08/10/98 09:48:34 CLW  
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PRECAUTIONARY STATEMENTS:
P102: Keep out of reach of children
P202: Do not handle until all safety precautions have been read and understood
P261: Avoid breathing dust
P273: Avoid release to the environment
P280: Wear protective gloves, clothing and eye protection

RESPONSE STATEMENTS:
P301 + P310 + P331: IF SWALLOWED: USA Immediately call the National POISON CENTER at 800-222-1222. DO NOT induce vomiting
P303 + P361 + 353: IF ON SKIN Take off immediately all contaminated clothing. Rinse skin with water
P304 + 340: IF INHALED, Remove to fresh air and keep comfortable for breathing
P305 + P351: IF IN EYES rinse cautiously with water for at least 15 minutes
P306 + P361: IF ON CLOTHING, Take off contaminated clothing
P370: In case of fire use foam, carbon dioxide, dry chemical to extinguish fire
P376: Stop a spill if safe to do so. See section 6 for proper clean up

STORAGE STATEMENTS:
P403: Keep Cool Store in a well-ventilated place

DISPOSAL STATEMENTS:
P501: Dispose of content and/or container in accordance with local, regional, national or international regulations

*** Section 3 - Hazards Identification ***

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310-73-2</td>
<td>Sodium Hydroxide</td>
<td>98-100</td>
</tr>
</tbody>
</table>

Synonyms: Caustic soda; Sodium hydrate; Lye; White caustic; Liquid caustic.

*** Section 4 - First Aid Measures ***

Emergency Overview
Sodium Hydroxide is a white, non-volatile solid available in flake, micropearl, and bead form. Corrosive. May cause severe burns to eyes and skin. Causes respiratory tract irritation or burns. Harmful or fatal if swallowed. Contact with water may generate heat and ignite combustible materials. Sodium hydroxide is one of the strongest alkaline caustics, and can react violently when in contact with many other substances. Keep away from water, strong acids, metals, organohalogen compounds, and nitro and chloro organic compounds.

Hazard Statements
DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. CAUSES SEVERE IRRITATION AND BURNS OF RESPIRATORY SYSTEM, EYES AND SKIN. REACTS WITH WATER TO GENERATE CONSIDERABLE HEAT. Do not get in eyes, on skin, or on clothing. Do not breathe dust or mist. Wash thoroughly after handling. Keep container closed. Use only with adequate ventilation. Keep away from water, strong acids, metals, organohalogen compounds, and nitro and chloro organic compounds.

Potential Health Effects: Eyes
Corrosive to eyes. Contact of the solid or concentrated liquid with the eyes can disintegrate the corneal and conjunctival epithelia and cause corneal opacification. Symptoms can include scarring, blistering, ulceration, clouding of the eye tissue, and blindness. Delayed effects may include glaucoma and cataracts.
Potential Health Effects: Skin
Corrosive to the skin. Can cause severe burns, ulceration and permanent scarring. Damage to skin may not be apparent until many hours following exposure, as alkali compounds penetrate the skin slowly. Chronic exposure to low levels can result in dermatitis.

Potential Health Effects: Ingestion
Harmful or fatal if swallowed. Ingestion causes severe irritation of the mouth, throat, and esophagus. Symptoms may include burning pain, vomiting, diarrhea, hypersalivation, shortness of breath, potential glottic edema with respiratory compromise, collapse and possibly death. Concentrated solutions can cause perforation of the stomach or gastrointestinal tract and corrosion and necrosis of the lips, mouth, tongue, pharynx, esophagus, and gastric mucosa.

Potential Health Effects: Inhalation
May cause irritation or inflammation of the nose, throat, and lungs. Inhalation of the aerosol may cause fluid accumulation in the lungs (pulmonary edema). Effects of inhalation may be delayed. Overexposure may cause ulceration of nasal passages. Chronic overexposure may cause obstructive airway disease.

First Aid: Eyes
In case of contact with eyes, rinse immediately with plenty of water for at least 20 minutes. Irrigation of the eyes should begin immediately, to avoid damage to tissue. Administer anesthetic eye drops after one minute of flushing if victim suffers from spasms to the eyes, in order to facilitate irrigation. Seek immediate medical attention. In the event of a severe overexposure, victim should consult with an ophthalmologist.

First Aid: Skin
Superficial irrigation of the burn is helpful only if begun immediately after exposure. Immediately irrigate exposed skin with copious amounts of water for at least 20 minutes or longer, depending on the concentration, amount, and duration of exposure. Seek medical advice. Completely decontaminate clothing, shoes, and leather goods before reuse. SEVERE BURNS CAN OCCUR EVEN WITH DILUTE SOLUTIONS IF THE TISSUE IS NOT PROMPTLY DECONTAMINATED.

First Aid: Ingestion
If the material is swallowed, get immediate medical attention or advice. DO NOT INDUCE VOMITING. Rinse mouth with water to decontaminate the oral mucosa. If no respiratory compromise is present, dilute immediately with 4 to 8 ounces of milk or water. Never give anything by mouth to a victim who is unconscious or having convulsions. If victim vomits naturally, position head lower than chest area so that aspiration into the lungs cannot occur. Contact a physician or poison control center immediately.

First Aid: Inhalation
Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician
Provide general supportive measures. Prolonged skin irrigation may be required in severe cases, occasionally up to 12 to 24 hours. Debridement of the burn and skin grafting are more successful if performed early, and may prevent delayed necrosis. Experimental treatment for eye contamination has shown that topical applications and subconjunctival injections of 2% ascorbic acid may significantly decrease the incidence of corneal ulcerations and perforations. This treatment was given for 32 days.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards
Product will not burn or support combustion. Water reactive. If in contact with moisture or water, this product can create a considerable amount of heat and ignite combustible materials. When wet, attacks metals such as aluminum, tin, lead, and zinc to produce flammable and explosive hydrogen gas.

Hazardous Combustion Products
Fire may produce irritating, corrosive and/or toxic gases. Some are oxidizers and may ignite combustibles. Can produce flammable hydrogen gas upon reaction with most metals. When heated to decomposition, it emits toxic fumes of sodium oxide, peroxides, or carbonates.
**Extinguishing Media**

Use any method suitable for the surrounding fire and other materials involved. Water can be used to extinguish fire as long as the water is used in flooding amounts and care is taken to not spatter or splash the sodium hydroxide. Use water spray to keep fire-exposed containers cool.

**Fire Fighting Equipment/Instructions**

Firefighters should wear full protective clothing including self contained breathing apparatus. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. Sodium hydroxide can melt and flow when heated.

**NFPA Ratings:**

- **Health:** 3
- **Fire:** 0
- **Reactivity:** 1
- **Other:**

<table>
<thead>
<tr>
<th>Hazard Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Minimal</td>
</tr>
<tr>
<td>1</td>
<td>Slight</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>Serious</td>
</tr>
<tr>
<td>4</td>
<td>Severe</td>
</tr>
</tbody>
</table>

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**Section 6 - Accidental Release Measures**

**Containment Procedures**

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information). Keep water away from the release.

**Clean-Up Procedures**

Wear appropriate protective equipment and clothing during clean-up. With a clean shovel, carefully place the material into a clean, dry, labeled waste container, and seal tightly. Neutralize the area of the spill with DILUTE acetic acid (vinegar). Ventilate the contaminated area. Thoroughly wash the area after clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

**Evacuation Procedures**

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. In case of large spills, follow all facility emergency response procedures.

**Special Procedures**

Wear adequate personal protective equipment. Do not allow the material to contact eyes, skin, or clothing. Do not inhale dusts. Ventilate the area.

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**Section 7 - Handling and Storage**

**Handling Procedures**

Avoid generation of dusts. Do not inhale dusts. Do not allow product to contact eyes, skin, or clothing. Use in designated areas with adequate ventilation. Use caution when preparing solutions as large amounts of heat may evolve. Solutions are extremely corrosive. Keep in air-tight containers. Containers of nickel alloys are preferred. Wash hands thoroughly after handling. Do not reuse the empty container.

Never add water to a corrosive. Always add corrosives to water. 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.

**Storage Procedures**

Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).

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* * * Section 7 - Handling and Storage Continued  * * *

Empty containers may contain residual particulates, which are corrosive; therefore, empty containers should be handled with care. Do not cut, grind, weld, or drill near this container. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

Sodium Hydroxide rapidly absorbs moisture and carbon dioxide from the air and deliquesces. Do not store this material in open or unlabeled containers. Keep separate from acids, metals, explosives, organic peroxides, and easily ignitable materials. Keep material dry.

Sodium Hydroxide can cause corrosion and destruction of polyester materials, including polyester thread sometimes used to sew bulk bags for chemicals. The use of polyester materials should be avoided for containers, including bags, of Sodium Hydroxide.

* * * Section 8 - Exposure Controls / Personal Protection  * * *

Exposure Guidelines

A: General Product Information
Follow the ACGIH recommended exposure limits.

B: Component Exposure Limits
Sodium Hydroxide (1310-73-2)

ACGIH:  2 mg/m³ (ceiling) STEL
OSHA:  2 mg/m³ (ceiling) TWA
NIOSH: 2 mg/m³ TWA

Engineering Controls
Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent Standards of Canada. Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment:  Eyes/Face
Wear safety glasses with side shields (or goggles) and a face shield, if this material is made into solution. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment:  Skin
Wear appropriate work gloves for type of operation. Neoprene or polyvinyl chloride gloves are recommended. Gloves should be tested to determine their suitability for prolonged contact with this material. Use of protective overalls and long sleeves is recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment:  Respiratory
If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA’s Respiratory Protection Standard (1910.134-1998). If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. The following NIOSH Respiratory Protection Guidelines for Sodium Hydroxide are presented for further guidance in respiratory protection selection:

Concentration  Respiratory Equipment
Up to 10 mg/m³: Supplied Air Respirator (SAR) operated in continuous-flow mode, or full-facepiece respirator with a high-efficiency particulate filter(s), or powered air-purifying respirator with dust and mist filter(s), or full-facepiece SCBA, or full facepiece SAR.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Positive pressure, full-facepiece SCBA, or positive pressure, full-facepiece SCBA with an auxiliary positive pressure SCBA.

Escape: Full-facepiece respirator with high-efficiency particulate filter(s), or escape-type SCBA.
**Section 8 - Exposure Controls / Personal Protection**

**Personal Protective Equipment: General**
Eyewash fountains and emergency showers are required. Use good hygiene practices when handling this material including changing and laundering work clothing after use.

**Protective Clothing Pictograms**
- Splash Goggles
- Gloves
- Protective Apron
- Dust Respirator

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**Section 9 - Physical & Chemical Properties**

**Physical Properties: Additional Information**
The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

- **Appearance:** White
- **Odor:** Odorless
- **Physical State:** Solid
- **pH:** 14 (5% solution)
- **Vapor Pressure:** 1.5 mmHg/0.2 kPa at 20 deg C
- **Vapor Density:** Not applicable
- **Boiling Point:** 2534 deg F (1390 deg C) @ 760 mm Hg
- **Freezing/Melting Point:** 605.1 deg F (318.4 deg C)
- **Solubility (H2O):** Freely soluble
- **Specific Gravity:** 2.130 @ 20 deg C (water = 1)
- **Softening Point:** Not applicable
- **Particle Size:** Not determined
- **Bulk Density:** Not available
- **Molecular Weight:** 40.01
- **Flash Point:** Not applicable
- **Chemical Formula:** NaOH

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**Section 10 - Chemical Stability & Reactivity Information**

**Chemical Stability**
Stable under normal conditions of pressure and temperature. Sodium Hydroxide will slowly attack glass at room temperature.

**Chemical Stability: Conditions to Avoid**
Avoid contact with moisture, water, and all other incompatible materials listed in this Section.

**Incompatibility**
Sodium Hydroxide reacts vigorously, violently or explosively with nitroaromatic nitroparaffin and organohalogen compounds, glycols and organic peroxides. Under certain conditions of temperature and pressure Sodium Hydroxide can ignite or react violently with acetic acid; acetaldehyde; acetic anhydride; acrolein, acrylonitrile, allyl alcohol, allyl chloride, aluminum, chloroform + methanol; hydrochloric acid, hydrofluoric acid, maleic anhydride, nitric acid, oleum, phosphorous, sulfuric acid, diborane + octanol oxime, hydroquinone, 4-methyl-2-nitrophenol, and cinnamaldehyde. (continued on next page)
Sodium Hydroxide reacts violently with water, generating significant heat and dangerous spattering of the corrosive solution that is formed. This reaction may generate enough heat to ignite adjacent combustible materials. Sodium Hydroxide violently polymerizes acetaldehyde, acrolein, or acrylonitrile. Sodium Hydroxide will produce flammable and explosive hydrogen gas if it reacts with sodium tetraborate or metals, such as aluminum, tin or zinc. Can form spontaneously flammable chemicals upon contact with 1,2-dichloroethylene, trichloroethylene or tetrachloroethene. Sodium Hydroxide can produce carbon monoxide upon contact with solutions of sugars, such as fructose, lactose and maltose. Sodium Hydroxide and aluminum + arsenic compounds will form the poisonous gas arsine. Sodium Hydroxide will react vigorously with 1,2,4,5-tetrachlorobenzene. This reaction forms extremely toxic 2,3,7,8-tetrachlorodibenzodioxin. A potentially explosive reaction will occur with bromine; 4-chlorobutyronitrile; 4-chloro-2-methylphenol (in storage); nitrobenzene + heat; sodium tetrahydroborate; 2,2,2-trichloroethanol; zirconium + heat.

Sodium Hydroxide will react to form explosive products with ammonia + silver nitrate, and trichloroethylene. Sodium Hydroxide can cause corrosion and destruction of polyester materials, including polyester thread sometimes used to sew bulk bags for chemicals. The use of polyester materials should be avoided for containers, including bags, of Sodium Hydroxide. Crude hydroquinone mixed with Sodium Hydroxide can cause an evolution of considerable amount of heat. Sodium Hydroxide solution used to catch and neutralize bromine can react violently if not stirred. Lack of stirring allows a layer of un-reacted bromine to form below the alkali. A delayed, violent eruption can occur when the layers are disturbed during disposal operations. Continuous stirring is essential to prevent stratification of slowly reacting, mutually insoluble liquids.

Interaction of cyanogen azide with 10% ALKALI Sodium Hydroxide solutions forms sodium 5-azidotetrazolide, which explodes violently if isolated. Sodium Hydroxide can react with amphoteric metals, generating extremely flammable hydrogen gas.

Hazardous Decomposition
Fire may produce irritating, corrosive and/or toxic gases. Some are oxidizers and may ignite combustibles. Can produce flammable hydrogen gas upon reaction with most metals. When heated to decomposition, it emits toxic fumes of sodium oxide, peroxides, or carbonates. Sodium Hydroxide will rapidly absorb carbon dioxide from the air to form sodium carbonate. Sodium Hydroxide decomposes to form sodium oxide and water.

Hazardous Polymerization
Sodium Hydroxide violently polymerizes acetaldehyde, acrolein, or acrylonitrile.

Acute and Chronic Toxicity
A: General Product Information
Sodium hydroxide is one of the strongest alkaline caustics. Sodium hydroxide is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. It can cause severe burns and permanent damage to any tissue with which it comes in contact. The severity of the tissue damage caused by sodium hydroxide is a function of its concentration, the length of tissue contact time, and local conditions and skin type. Severe burns to skin can occur even with dilute solutions if the tissue is not promptly decontaminated. Can cause severe burns, ulceration and permanent scarring. Damage to skin may not be immediately apparent, and may be latent in onset due to formation of alkaline albuminates and fatty soaps in the tissue. When sodium hydroxide comes into contact with the skin it does not usually cause immediate pain, but it does cause immediate damage. Contact of the solid or concentrated liquid with the eyes can disintegrate the corneal and conjunctival epithelia and cause corneal opacification. Symptoms can include scarring, blistering, ulceration, clouding of the eye tissue and blindness. Delayed effects may include glaucoma and cataracts. Sodium hydroxide fails to coagulate protein, which would serve to prevent further penetration. Therefore, upon contact with eyes, washing with water must be started as quickly as possible, and continued for at least 15 minutes to prevent permanent injury. May cause irritation or inflammation of the nose, throat, and lungs. Inhalation of the aerosol may cause pulmonary edema. Effects of inhalation may be delayed. Overexposure may cause ulceration of nasal passages. Chronic overexposure may cause obstructive airway disease. Repeated exposure to mists or aerosols of sodium hydroxide can produce tolerance to its irritant effects. Ingestion of large doses may cause irritation of the mouth, throat and esophagus. Symptoms may include a burning pain, vomiting, diarrhea, hypersalivation, shortness of breath, potential glottic edema with respiratory compromise, collapse and possibly death. There may be a delay of weeks or months for esophageal strictures to form following ingestion. Concentrated solutions can cause perforation of the stomach or gastrointestinal tract and corrosion and necrosis of the lips, mouth, tongue, pharynx, esophagus, and gastric mucosa.
**Section 11 - Toxicological Information Continued**

**B: Component Analysis - LD50/LC50**
Sodium Hydroxide (1310-73-2)
LD50 (Intraperitoneal-mouse) 40 mg/kg

**B: Component Analysis - LD50/LC50**
Sodium Hydroxide (1310-73-2)
LDLo (Oral-rabbit) 500 mg/kg

**Carcinogenicity**

**A: General Product Information**
Squamous cell carcinomas arise frequently in tissue healing from sodium hydroxide burns. These cancers probably arise as a result of nonspecific irritant action on the tissue and abnormalities in the regenerative process, rather than due to a specific carcinogenic effect of sodium hydroxide.

**B: Component Carcinogenicity**
None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

**Epidemiology**
Information not available.

**Neurotoxicity**
Information not available.

**Mutagenicity**
Sodium hydroxide induced chromosome aberrations in grasshoppers and hamster lung cells, and also possibly in other test systems. However, pH alterations from agents such as sodium hydroxide can cause false positive results in short-term genetic assays.

**Teratogenicity**
Sodium hydroxide at a concentration of 0.001 Molar injected directly into the amniotic fluid was not teratogenic to rats, but was slightly embryotoxic.

**Other Toxicological Information**
Eye-monkey: 1%/24 hours: Severe; Skin-rabbit: 500 mg/24 hours: Severe; Eye-rabbit: 400 µg: Mild; Eye-rabbit: 1%: Severe
Eye-rabbit: 50 µg/24 hours: Severe; Eye-rabbit: 1 mg/24 hours: Severe; Rinsed with water-eye-rabbit: 1 mg/30 seconds: Severe

**Section 12 - Ecological Information**

**Ecotoxicity**

**A: General Product Information**
Expected to be highly toxic to aquatic organisms and ecosystems due to effects on pH.

**B: Ecotoxicity**
Acute Hazard Level:
- Lethal pH (goldfish) = 10.9
- Lethal pH (bluegill) = 10.5
- LC100 (Cyprinus carpio) 24 hours = 180 ppm/ 25°C; TLm (mosquito fish) 96 hours = 125 ppm/ fresh water; TLm (bluegill) 48 hours = 99 mg/L/ tap water

**Environmental Fate**
Persistence: Natural carbon dioxide will neutralize very slowly. Sodium Hydroxide is not expected to accumulate in the food chain.
Major Species Threatened: All species.
If released to an aquatic environment, Sodium Hydroxide, ground water pollution will occur if precipitation occurs prior to clean-up. Precipitation will dissolve some of the solid (with generation of heat) and will create an aqueous solution of Sodium Hydroxide, which will then penetrate soil and leach to groundwater.
**Safety Data Sheet**

**Material Name: Sodium Hydroxide (Caustic Soda)**

**ID: C1-142**

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**Section 13 - Disposal Considerations**

**US EPA Waste Number & Descriptions**

**A: General Product Information**
- Wastes may be classified as D002, D003 (Corrosive, Reactive Waste). Wastes of this material must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

**B: Component Waste Numbers**
- No EPA Waste Numbers are applicable for this product's components.

**Disposal Instructions**
- Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

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**Section 14 – Transportation Information Ground**

**NOTE:** The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under 49 CFR, IATA and IMDG to assure regulatory compliance.

**US DOT 49 CFR 100-185 Revised February 5, 2015 Information**

**UN/NA #: UN 1823**
- **Shipping Name:** Sodium Hydroxide Solid
- **Hazard Class:** 8
- **Packing Group:** II
- **Required Label(s):** 8
- **Special Provision:** IB8, IP2, IP4
- **Packaging:** 173.154, 172.212, 172.240
- **RQ Quantity:** For a single package less than the RQ of 1,000lb (454 kg), the RQ designation should not be used.

**Additional Shipping Information**

**Limited Quantity Shipments:** Shipments, except for air, need not be marked with the Proper Shipping Name of the contents, but shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100 mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg (66 pounds).

**Small Quantities for Highway and Rail:** The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle. The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement of the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test requirements of 173.4(6) (i). The outside of the package must be marked with the statement “This package conforms to 49 CFR 173.4 for domestic highway or rail transport only.”

**Excepted Quantities:** The maximum quantity of this material per inner receptacle is limited to 30 g (1 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 500g (1.1 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet a drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce. For highway or rail transportation no shipping paper is required. The package must be legibly marked with the following marking:

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De minimis Exceptions: The maximum quantity of this material per inner receptacle is limited to 1g (0.04 ounce) per receptacle and the aggregate quantity of this material per completed package does not exceed 100 g (0.22 pounds). The inner receptacles must be securely packed in an inside packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg (64 pounds). The completed package must meet the drop test. The requirements are found in 173.4(6) (i). The package must not be opened or otherwise altered until it is no longer in commerce and may be transported by aircraft. If all of the above requirements are met, then this material is not regulated.

66th Edition International Air Transport Association (IATA):
For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country

UN/NA #: UN 1823
Proper Shipping Name: Sodium Hydroxide Solid
Hazard Class: 8
Packaging Group: II
Passenger & Cargo Aircraft Packing Instruction: 859
Passenger & Cargo Aircraft Maximum Net Quantity: 15 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y844
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 5 kg
Cargo Aircraft Only Packing Instruction: 863
Cargo Aircraft Only Maximum Net Quantity: 50 kg
Excepted Quantities: E2
Special Provisions: None
ERG Code: 8L
Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name Sodium Sulfide, hydrated UN 1849 and shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background and the symbol “Y” must be black and located in the center of the square-on-point. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100 mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30g per receptacle and the aggregate quantity of this material per completed package does not exceed 0.5kg. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The *** must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The **** must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.
** SECTION 14 – Transportation Information Vessel **

Amendment 37-14 International Maritime Dangerous Goods (IMDG) Code
For shipments via marine vessel transport, the following classification information applies.

**UN/NA #: UN 1823**

**Proper Shipping Name:** SODIUM HYDROXIDE SOLID

**Hazard Class:** Class 8

**Packing Group:** II

**Special Provisions:** None

**Limited Quantities:** 1kg

**Excepted Quantities:** E2

**Packing Instructions:** P002

**Provisions:** none

**IBC Instructions:** IBC08

**IBC Provisions:** B2, B4

**EmS:** F-A, S-B

**Stowage and Handling:** Category A

**Segregation:** SG35

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**Limited Quantity Shipments:** Shipments need not be marked with the Proper Shipping Name of the contents, but shall be marked with a diamond. The top and bottom portions of the square-on-point must be black and the center white or of a suitable contrasting background. The mark must be at least 2 mm. Each side must have a minimum dimension of 100 mm. Small packages which cannot reasonably accommodate a 100 mm square-on-point mark may be marked with a square-on-point mark with a minimum side dimension of 50 mm. The total weight of each outer packaging cannot exceed 30 kg (66 pounds). A Dangerous Cargo Declaration Form required.

**Excepted Quantities:** The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 0.5kg. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 3.5.3.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:

---

**NOTE:** The ** symbol must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The *** symbol must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.
**Section 15 - Regulatory Information**

**A: General Product Information**
None.

**B: Component Analysis**
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

**SARA 302 (EHS TPQ)**
There are no specific Threshold Planning Quantities for Sodium Hydroxide. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

**C: Sara 311/312 Tier II Hazard Ratings**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Fire Hazard</th>
<th>Reactivity Hazard</th>
<th>Pressure Hazard</th>
<th>Immediate Health Hazard</th>
<th>Chronic Health Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Section 15 - Regulatory Information (Continued)**

**State Regulations**

**A: General Product Information**
Other state regulations may apply.

**B: Component Analysis - State**
The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>CA</th>
<th>FL</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Other Regulations**

**A: General Product Information**
Not determined.

**B: Component Analysis - Inventory**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>EINECS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**C: Component Analysis - WHMIS IDL**
The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Minimum Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>1% item 1442 (998)</td>
</tr>
</tbody>
</table>

**ANSI LABELING (Z129.1):**

**DANGER!** CORROSIVE. MAY BE FATAL IF SWALLOWED. CAUSES SEVERE IRRITATION AND BURNS OF RESPIRATORY SYSTEM, EYES AND SKIN. REACTS WITH WATER TO GENERATE CONSIDERABLE HEAT. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, face shields, suitable body protection, and NIOSH approved respiratory protection, as appropriate. Can be corrosive to metals. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO$_2$, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material or neutralizing agent for bases. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.
Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product(s) and/or the program(s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend
EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD
Contact Phone: (713)-896-9966

Revision Log
08/28/00 4:21 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
06/02/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Rating.
08/20/01 4:14 PM CLJ Changed contact to Sue, non-800 Chemtrec Num.
10/22/01 4:14 PM HDF Added incompatibility with polyester statement Sec 7 & 10
11/16/01 2:06 PM SEP Sect 14, removed RQ from shipping name and modified Additional Info statement on RQ.
02/18/02 11:13 AM HDF Up-date of SARA Hazard Ratings
07/31/02 11:13 PM HDF General review of entire MSDS. Up-grade Section 10 Reactivity Information. Up-Dated entire Section 14 Transportation Information to include IATA, IMO transport information.
06/22/05 1:13 pm SEP Update IATA Section 14
09/05/05 3:25 pm SEP Updated DOT & IMO Section 14
10/15/08 9:35 AM DLY Changed Chem One Physical Address, Section 1
09/18/09 MMK Updated Section 14, limited and excepted quantities and exceptions
02/04/2015 GHS Revision all sections
This is the end of SDS # C1-142

Revised By:
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