Section 01 - Product And Company Identification

Product Identifier
Sodium Hydroxide Solution [1-50%]

Other Means of Identification
Caustic soda, sodium hydrate, lye, liquid caustic, caustic

Product Use and Restrictions on Use
Acid neutralization, petroleum refining, manufacture of paper products, metal cleaning, regeneration of ion exchange resins.

Initial Supplier Identifier
ClearTech Industries Inc.
1500 Quebec Avenue
Saskatoon, SK. Canada
S7K 1V7

Prepared By
ClearTech Industries Inc. Technical Writer
Phone: 1 (800) 387-7503

24-Hour Emergency Phone
Phone: 1 (306) 664 – 2522

Section 02 - Hazard Identification

GHS-Classification
Skin Corrosion/Irritation Category 1A
Serious Eye Damage/Irritation Category 1

Physical Hazards
Corrosive to Metals Category 1

Danger

Hazard Statement
H290 – May be corrosive to metals.
H314 – Causes severe skin burns and eye damage.

Pictograms

Precautionary Statements
P234 – Keep only in original container.
P405 – Store locked up.
P260 – Do not breathe mist, vapors or spray. Use only outdoors or in well-ventilated area.
P304 + P340 – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P280 – Wear protective gloves, protective clothing, eye protection, and face protection.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P361 + P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin
P363 – Wash contaminated clothing before reuse.
P301 + P330 + P331 – IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P310 – Immediately call a POISON CENTER or doctor/physician.
P390 – Absorb spillage to prevent material damage.
P501 – Dispose of contents/container in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 03 - Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Weight %</th>
<th>Unique Identifiers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>≤ 50%</td>
<td>Not Available</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>to 100%</td>
<td></td>
</tr>
</tbody>
</table>

Section 04 - First Aid Measures

Inhalation
If symptoms are experienced, remove source of contamination or move victim to fresh air. Seek immediate medical attention.

Skin Contact / Absorption
Avoid direct contact. Remove contaminated clothing. Rinse skin with lukewarm, gently flowing water for at least 60 minutes. DO NOT INTERRUPT FLUSHING. Seek immediate medical attention. Completely decontaminate clothing, shoes and leather goods before re-use or discard.

Eye Contact
Contact lenses should never be worn when working with this product. Flush immediately with water for at least 30 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention.

Ingestion
NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Seek medical attention.

Additional Information
Not Available

Section 05 - Fire Fighting Measures

Suitable Extinguishing Media
Product does not burn. Use extinguishing media compatible with sodium hydroxide and appropriate for surrounding fire.

Unsuitable Extinguishing Media
Carbon dioxide.

Specific Hazards Arising From the Chemical
Solid sodium hydroxide in contact with moisture or water may generate sufficient heat to ignite nearby combustible materials. When moist, sodium hydroxide can react with metals, such as aluminum, tin and zinc, to form flammable and explosive hydrogen gas. Sodium hydroxide can react with a number of commonly encountered materials, such as acids, releasing enough heat to ignite nearby combustible materials. When heated to temperatures greater than 318-323°C (e.g. in a fire), solid sodium hydroxide will flow to low ground. When hot or in the molten state, it can react violently with water causing spattering and releasing an irritating mist. Toxic sodium oxide fumes can be generated by thermal decomposition at elevated temperatures. Closed containers may rupture violently when heated.

Special Protective Equipment for Fire-Fighters
Sodium hydroxide solid and solutions are very corrosive and at high temperatures, decomposition occurs giving off strong, corrosive fumes of sodium oxide. Do not enter without wearing NIOSH-approved self-contained breathing apparatus and clothing.

Further Information
Not Available
Section 06 - Accidental Release Measures

Personal Precautions / Protective Equipment / Emergency Procedures
Wear appropriate personal protective equipment. Ventilate area. Only enter area with PPE. Stop or reduce leak if safe to do so. Flush with water to remove any residue.

Environmental Precautions
Prevent material from entering sewers and waterways.

Methods and Materials for Containment and Cleaning Up
Solutions should be contained by diking with inert material, such as sand or earth. Solutions can be recovered or carefully diluted with water and cautiously neutralized with acids such as acetic acid or hydrochloric acid. LARGE SPILLS: Contact fire and emergency services and supplier for advice.

Section 07 - Handling and Storage

Precautions for Safe Handling
This material is EXTREMELY CORROSIVE and HIGHLY REACTIVE. Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.

Conditions for Safe Storage
Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from incompatible materials.

Incompatibilities
Water, aluminum, tin, zinc, tetrahydrofuran, 1,2,4,5-tetrachlorobenzene, 2,2,2-trichloroethanol, chloronitrobenzenes, nitrobenzene, maleic anhydride, cyanogen azide, nitroalkanes, silver nitrate, ammonia, zirconium, acetaldehyde, acrolein, acrylonitrile, allyl alcohol, allyl chloride, zinc dust, 1,2-dichloroethylene, trichloroethylene, tetrachloroethane, phosphorus, hydroquinone, cinnamaldehyde, mineral acids, chlorine trifluoride, phosphorous pentoxide, trichloronitromethane, sugars, chloroform, methanol.

Section 08 - Exposure Controls and Personal Protection

Exposure Limit(s)

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of Listing</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>ACGIH</td>
<td>TLV-C</td>
<td>2mg/m^3</td>
</tr>
<tr>
<td></td>
<td>OSHA</td>
<td>PEL-T-TWA</td>
<td>2mg/m^3</td>
</tr>
</tbody>
</table>

Engineering Control(s)

Ventilation Requirements
Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions must be provided in accordance with all fire codes and regulatory requirements. Supply sufficient replacement air to make up for air removed by exhaust systems.

Other
Emergency shower and eyewash must be available and tested in accordance with regulations and be in close proximity.

Protective Equipment

Eyes/Face
Chemical goggles, full-face shield, or a full-face respirator should be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Hand Protection
Impervious gloves of chemically resistant material (rubber or PVC) should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.

Skin and Body Protection
Body suit, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.

Impervious boots of chemically resistant material should be worn at all times. No special footwear is required other than what is mandated at place of work.
**Respiratory Protection**

NIOSH RECOMMENDATIONS FOR SODIUM HYDROXIDE CONCENTRATIONS IN AIR (3):

- **Up to 10 mg/m³:** Any supplied-air respirator operated in a continuous-flow mode. Any powered air-purifying respirator with a high-efficiency particulate filter.  
- **(APF = 50)** Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece.

**Thermal Hazards**  
Not Available

---

**Section 09 - Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Physical State</strong></td>
<td>Viscous liquid</td>
</tr>
<tr>
<td><strong>Colour</strong></td>
<td>Clear to slightly turbid</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Odourless</td>
</tr>
<tr>
<td><strong>Odour Threshold</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Property</strong></td>
<td></td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>13-14</td>
</tr>
<tr>
<td><strong>Melting Point/Freezing Point</strong></td>
<td>≤12°C</td>
</tr>
<tr>
<td><strong>Initial Boiling Point and Boiling Range</strong></td>
<td>&lt;145°C</td>
</tr>
<tr>
<td><strong>Flash Point</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Evaporation Rate</strong></td>
<td>The only evaporation that occurs is water.</td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>Non-Flammable</td>
</tr>
<tr>
<td><strong>Upper Flammable Limit</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Lower Flammable Limit</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Vapour Pressure (mm Hg, 20°C)</strong></td>
<td>~0</td>
</tr>
<tr>
<td><strong>Vapour Density (Air=1)</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Relative Density</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Solubility(ies)</strong></td>
<td>Very soluble in water. Soluble in absolute alcohol, methanol and glycerol; moderately soluble in ethanol; insoluble in acetone and diethyl ether.</td>
</tr>
<tr>
<td><strong>Partition Coefficient: n-octanol/water</strong></td>
<td>Not Applicable (dissociates)</td>
</tr>
<tr>
<td><strong>Auto-ignition Temperature</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Decomposition Temperature</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>36.31cP (40% solution)</td>
</tr>
<tr>
<td><strong>Explosive Properties</strong></td>
<td>Not Available</td>
</tr>
</tbody>
</table>
Specific Gravity (Water=1) 1.22-1.53
% Volatiles by Volume Not Available
Formula NaOH
Molecular Weight 40.00

Section 10 - Stability and Reactivity

Reactivity Not Available
Stability Normally stable if kept dry. Rapidly absorbs carbon dioxide and water from the air forming sodium carbonate.
Possibility of Hazardous Reactions Polymerization will not occur.
Conditions to Avoid Water, generation of dust.
Incompatible Materials Water, aluminum, tin, zinc, tetrahydrofuran, 1,2,4,5-tetrachlorobenzene, 2,2,2-trichloroethanol, chloronitrotoluenes, nitrobenzene, maleic anhydride, cyanogen azide, nitroalkanes, silver nitrate, ammonia, zirconium, acetaldehyde, acrolein, acrylonitrile, allyl alcohol, allyl chloride, zinc dust, 1,2-dichloroethylene, trichloroethylene, tetrachloroethene, phosphorus, hydroquinone, cinnamaldehyde, mineral acids, chlorine trifluoride, phosphorous pentoxide, trichloronitromethane, sugars, chloroform, methanol.
Hazardous Decomposition Products Sodium oxide fumes may be generated by thermal decomposition at high temperatures.

Section 11 - Toxicological Information

Acute Toxicity

<table>
<thead>
<tr>
<th>Component</th>
<th>Oral LD$_{50}$ (mg/kg, rat)</th>
<th>Dermal LD$_{50}$ (mg/kg)</th>
<th>LC$_{50}$ (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide (50%)</td>
<td>280-680</td>
<td>2700</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Chronic Toxicity – Carcinogenicity

<table>
<thead>
<tr>
<th>Component</th>
<th>IARC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>Not considered to be carcinogenic by ACGIH and IARC.</td>
</tr>
</tbody>
</table>

Skin Corrosion/Irritation Corrosive to skin.
Ingestion Ingestion can result in burns to the lips, tongue, throat, esophagus and stomach; abdominal pain; nausea; vomiting; diarrhea and death.
Inhalation Inhalation is only likely to occur if an aerosol is formed as sodium hydroxide does not readily form a vapour. Exposure to aerosol may lead to irritation of respiratory tract, inflammation of lungs, difficulty breathing. May cause pulmonary edema.
Serious Eye Damage/Irritation Corrosive. Capable of producing severe eye burns and permanent injury.
Respiratory or Skin Sensitization Sodium hydroxide is not known to be a skin sensitizer.
Germ Cell Mutagenicity The available evidence does not suggest that sodium hydroxide is a mutagen.
Reproductive Toxicity Sodium hydroxide is not known to cause reproductive toxicity.
STOT-Single Exposure Breathing may result in respiratory irritation.
STOT-Repeated Exposure Not Applicable
Aspiration Hazard Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May cause severe pneumonitis and destruction of lung tissue. May cause pulmonary edema.
Section 12 - Ecological Information

**Ecotoxicity**

<table>
<thead>
<tr>
<th>Component</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Daphnia and Other Aquatic Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Hydroxide</td>
<td>Not Available</td>
<td>LC₅₀ (Gambusia affinis, 96hr): 125mg/L</td>
<td>EC₅₀ (Ceriodaphnia dubia, 48hr): 40.38mg/L</td>
</tr>
</tbody>
</table>

**Biodegradability**
Not biodegradable.

**Bioaccumulation**
Does not bioaccumulate.

**Mobility**
Very mobile in soil and very soluble in water.

**Other Adverse Effects**
Toxic to aquatic life through an immediate raise in pH to toxic levels.

Section 13 - Disposal Considerations

**Waste From Residues/Unused Products**
Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

**Contaminated Packaging**
Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transport Information

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN 1824</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Proper Shipping Name</td>
<td>SODIUM HYDROXIDE SOLUTION</td>
</tr>
<tr>
<td>Transport Hazard Class(es)</td>
<td>8</td>
</tr>
<tr>
<td>Packaging Group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental Hazards</td>
<td>Not listed as a marine pollutant under Canadian TDG Regulations, schedule III.</td>
</tr>
<tr>
<td>Special Precautions</td>
<td>Not Available</td>
</tr>
<tr>
<td>Transport in Bulk</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Additional Information**

<table>
<thead>
<tr>
<th>Packing Group</th>
<th>Limited Quantity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>1 L</td>
</tr>
<tr>
<td>III</td>
<td>5 L</td>
</tr>
</tbody>
</table>

**TDG**

**Other**
Secure containers (full and/or empty) with suitable hold down devises during shipment and ensure all caps, valves, or closures are secured in the closed position.

**TDG PRODUCT CLASSIFICATION:** This product has been classified on the preparation date specified at section 14 of this MSDS / SDS, for transportation in accordance with the requirements of part 2 of the Transportation of Dangerous Goods Regulations. If applicable, testing and/or published test data regarding the classification of this product are listed in the references at section 16 of this MSDS / SDS.

Section 15 - Regulatory Information

**NOTE:** THE PRODUCT LISTED ON THIS SDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS SDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.
NSF Certification

Product is certified under NSF/ANSI Standard 60 for corrosion and scale control, and pH adjustment at a maximum dosage for the following:

- Sodium hydroxide 10%: 500mg/L
- Sodium hydroxide 11%: 454mg/L
- Sodium hydroxide 12%: 416mg/L
- Sodium hydroxide 13%: 384mg/L
- Sodium hydroxide 14%: 357mg/L
- Sodium hydroxide 15%: 333mg/L
- Sodium hydroxide 16%: 312mg/L
- Sodium hydroxide 17%: 294mg/L
- Sodium hydroxide 18%: 277mg/L
- Sodium hydroxide 19%: 263mg/L
- Sodium hydroxide 20%: 250mg/L
- Sodium hydroxide 21%: 238mg/L
- Sodium hydroxide 22%: 227mg/L
- Sodium hydroxide 23%: 217mg/L
- Sodium hydroxide 24%: 208mg/L
- Sodium hydroxide 25%: 200mg/L
- Sodium hydroxide 26%: 192mg/L
- Sodium hydroxide 27%: 185mg/L
- Sodium hydroxide 28%: 178mg/L
- Sodium hydroxide 29%: 172mg/L
- Sodium hydroxide 30%: 167mg/L
- Sodium hydroxide 31%: 161mg/L
- Sodium hydroxide 32%: 156mg/L
- Sodium hydroxide 33%: 151mg/L
- Sodium hydroxide 34%: 147mg/L
- Sodium hydroxide 35%: 143mg/L
- Sodium hydroxide 36%: 138mg/L
- Sodium hydroxide 37%: 135mg/L
- Sodium hydroxide 38%: 131mg/L
- Sodium hydroxide 39%: 128mg/L
- Sodium hydroxide 40%: 125mg/L
- Sodium hydroxide 41%: 122mg/L
- Sodium hydroxide 42%: 119mg/L
- Sodium hydroxide 43%: 116mg/L
- Sodium hydroxide 44%: 114mg/L
- Sodium hydroxide 45%: 111mg/L
- Sodium hydroxide 46%: 108mg/L
- Sodium hydroxide 47%: 106mg/L
- Sodium hydroxide 48%: 104mg/L
- Sodium hydroxide 49%: 102mg/L
- Sodium hydroxide 50%: 100mg/L

NSF product use restrictions based on requirements obtained from the NSF website for current requirements.

Section 16 - Other Information

Preparation Date: July 31, 2015

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / SDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service center.

References:

1) CHEMINFO
2) eChemPortal
3) TOXNET
4) Transportation of Dangerous Goods Canada
5) CHRIS
6) HSDB
7) ECHA

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24 Hour Emergency Number - All Locations – 1(306) 664-2522