1. Product and Company Identification

Material name: CAUSTIC SODA
Chemical name: Sodium hydroxide
Applications: Alkalinity Control
Supplier: Baker Hughes Drilling Fluids
2001 Rankin Rd.
Houston, TX 77073
Emergency telephone number 713-439-8900

2. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>SODIUM HYDROXIDE</td>
<td>1310-73-2</td>
<td>&gt; 97</td>
</tr>
</tbody>
</table>

Non-hazardous and other components below reportable levels

Composition comments: This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

3. Hazards Identification

Emergency overview: May cause severe irritation or burns to the eyes, skin, gastrointestinal tract, and respiratory system. Risk of serious damage to eyes.

Potential health effects:

Routes of exposure:
- Inhalation: Skin contact. Eye contact.
- Eyes: Causes severe eye burns. Corrosive to the eyes and may cause severe damage including blindness.
- Skin: Contact causes severe skin irritation and possible burns.
- Inhalation: Can cause severe respiratory irritation. Inhalation of mists or vapors may produce upper airway edema, wheezing, pulmonary edema, pneumonitis and respiratory failure.
- Ingestion: Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. Ingestion of this product may cause nausea, vomiting and diarrhea.

Target organs: Eyes. Respiratory system. Skin.
Chronic effects: Prolonged skin contact may defat the skin and produce dermatitis.

4. First Aid Measures

First aid procedures:
- **Eye contact**: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention immediately.
- **Skin contact**: Wash off immediately with plenty of water for at least 15 minutes. Wash affected area with mild soap and water. Remove and isolate contaminated clothing and shoes. Get medical attention immediately. Launder contaminated clothing before reuse.
- **Inhalation**: Move to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately.
- **Ingestion**: Immediately give large quantities of water to drink. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Get medical attention immediately.

General advice: Keep victim warm. In case of shortness of breath, give oxygen. Immediate medical attention is required. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties: None known.
Extinguishing media:
- **Suitable extinguishing media**: Do not use water. Use extinguishing agent suitable for type of surrounding fire.
Protection of firefighters

Move containers from fire area if you can do it without risk. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

6. Accidental Release Measures

Evacuation procedures
Ventilate closed spaces before entering. Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained.

Methods for containment
Prevent entry into waterways, sewers, basements or confined areas. Stop the flow of material, if this is without risk.

Methods for cleaning up
Shovel or sweep up. Avoid dust formation.

7. Handling and Storage

Handling
Handle and open container with care. Avoid breathing dusts from this material. Do not get this material in your eyes, on your skin, or on your clothing. Wash hands after handling and before eating. Considerable heat is generated when water or acid is added, therefore when making solutions always add the caustic to the water or acid with constant stirring.

Storage
Use care in handling/storage. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep this material away from food, drink and animal feed. Keep out of the reach of children.

8. Exposure Controls / Personal Protection

Exposure guidelines

ACGIH - Threshold Limits Values - Ceilings (TLV-C)
SODIUM HYDROXIDE 1310-73-2 2 Mg/m3 Ceiling

ACGIH - Threshold Limits Values - TLV Basis - Critical Effects
SODIUM HYDROXIDE 1310-73-2 irritation

OSHA - Final PELs - Time Weighted Averages (TWAs)
SODIUM HYDROXIDE 1310-73-2 2 Mg/m3 TWA

Engineering controls
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Personal protective equipment

Eye / face protection
Wear chemical goggles. Face-shield. Eye wash fountain and emergency showers are recommended.

Skin protection
Use of protective coveralls and long sleeves is recommended. Use of impervious boots is recommended. Use of an impervious apron is recommended. Recommended gloves include rubber, neoprene, nitrile or viton.

Respiratory protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

General hygiene considerations
Avoid contact with the skin and the eyes. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Appearance / Color / Form

Odor
Odourless.

Clarity
Not available

Odor threshold
Not available

Physical state
Solid

pH
12, conc: 0.05% (solution); 13, conc: 1% (solution); 14, conc: 5% (solution)

Melting point
604.4 °F (318 °C) estimated

Freezing point
Not available

Boiling point
2534 °F (1390 °C) estimated

Flash point
Not available

Evaporation rate
Not available

Flammability limits in air, lower, % by volume
Not available

Flammability limits in air, upper, % by volume
Not available

Vapor pressure
0 HPa at 20 °C

Vapor density
Not available
### 2.13 Specific gravity
2.13 @20 C

### 2.13 Relative density
2.1322 estimated

### Solubility
Soluble in water.

### Octanol/H2O coeff
Not available

### Auto-ignition temperature
Not available

### Decomposition temperature
Not available

### Molecular weight
40.01 g/mol

### Molecular formula
NaOH

### 10. Chemical Stability and Reactivity Information

**Chemical stability**
Stable at normal conditions.

**Conditions to avoid**
Avoid contact with water. Direct contact with water may cause an exothermic reaction.

**Incompatible materials**
Alkali sensitive metals or alloys including aluminum, brass, bronze, copper, lead, tin, and zinc. Acids. Halogenated compounds.

**Hazardous decomposition products**
None known.

**Possibility of hazardous reactions**
Will not occur.

### 11. Toxicological Information

**Acute effects**
Causes severe burns.

**Component analysis - LD50**

<table>
<thead>
<tr>
<th>Toxicology Data - Selected LD50s and LC50s</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SODIUM HYDROXIDE</td>
<td>1310-73-2</td>
</tr>
<tr>
<td>Dermal LD50 Rabbit</td>
<td>1350 mg/kg</td>
</tr>
</tbody>
</table>

**Chronic effects**
Prolonged or repeated exposure may cause lung injury. Prolonged skin contact may defat the skin and produce dermatitis.

### 12. Ecological Information

**Ecotoxicity**
Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

**Environmental effects**
Harmful to aquatic life.

**Persistence / degradability**
This material is inorganic and not subject to biodegradation.

**Bioaccumulation / accumulation**
Not expected to bioaccumulate.

### 13. Disposal Considerations

**Disposal instructions**
Dispose in accordance with all applicable regulations.

### 14. Transport Information

**Department of Transportation (DOT) Requirements**

<table>
<thead>
<tr>
<th>Basic shipping requirements:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper shipping name</td>
<td>Sodium hydroxide, solid</td>
</tr>
<tr>
<td>Hazard class</td>
<td>8</td>
</tr>
<tr>
<td>UN number</td>
<td>UN1823</td>
</tr>
<tr>
<td>Packaging group</td>
<td>II</td>
</tr>
</tbody>
</table>

**Additional information:**

<table>
<thead>
<tr>
<th>Special provisions</th>
<th>IB8, IP2, IP4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packaging exceptions</td>
<td>154</td>
</tr>
<tr>
<td>Packaging non bulk</td>
<td>212</td>
</tr>
<tr>
<td>Packaging bulk</td>
<td>240</td>
</tr>
<tr>
<td>ERG number</td>
<td>154</td>
</tr>
</tbody>
</table>

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Material name: CAUSTIC SODA

Material ID: 1070   Revision date: 27-MAR-2006   Print date: 27-MAR-2006
**IATA**

Basic shipping requirements:
- Proper shipping name: Sodium hydroxide, solid
- Hazard class: 8
- UN number: 1823
- Packaging group: II

**IMDG**

Basic shipping requirements:
- Proper shipping name: SODIUM HYDROXIDE, SOLID
- Hazard class: 8
- UN number: 1823
- Packaging group: II

Additional information:
- Hazard ID: 80
- Item: C6
- Labels required: 8
- Transport Category: 2

**15. Regulatory Information**

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

- **FDA - Direct Food Additives**
  - SODIUM HYDROXIDE: 1310-73-2, 21 CFR 173.310
- **FDA - Food Additives Generally Recognized as Safe (GRAS)**
  - SODIUM HYDROXIDE: 1310-73-2, 21 CFR 184.1763

**Occupational Safety and Health Administration (OSHA)**

- 29 CFR 1910.1200 hazardous chemical: Yes

**CERCLA (Superfund) reportable quantity**

- SODIUM HYDROXIDE: 1000

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

- Hazard categories:
  - Immediate Hazard - Yes
  - Delayed Hazard - No
  - Fire Hazard - No
  - Pressure Hazard - No
  - Reactivity Hazard - Yes

- **Section 302 extremely hazardous substance**: No

- **Section 311 hazardous chemical**: Yes

**Inventory status**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (CCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of New and Existing Chemicals (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Japanese Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Korean Inventory of Chemicals (KICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>No</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s).
The product is classified and labelled in accordance with EC directives or respective national laws.

State regulations

**Massachusetts - Right To Know List**
SODIUM HYDROXIDE 1310-73-2 Present

**New Jersey - Right to Know Hazardous Substance List**
SODIUM HYDROXIDE 1310-73-2 sn 1706

**Pennsylvania - RTK (Right to Know) List**
SODIUM HYDROXIDE 1310-73-2 Environmental hazard

### 16. Other Information

**HMIS ratings**
- Health: 3*
- Flammability: 0
- Physical hazard: 2
- Personal protection: D

**NFPA ratings**
- Health: 3
- Flammability: 0
- Instability: 2

**Disclaimer**
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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Cheryl Hood - (713)625-4888

**Issue date**
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