SAFETY DATA SHEET
according to Regulation (EC) No. 453/2010

SODIUM HYPOCHLORITE SOLUTION

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product Identifier
Product Name: SODIUM HYPOCHLORITE SOLUTION
Internal ID Code: HM003443

1.2. Relevant identified uses of the substance or mixture and uses advised against
Recommended Use: Solvent
Sector of use: SU2 - Mining, (including offshore industries)
Product category: PC20 - Products such as pH-regulators, flocculants, precipitants, neutralization agents, other unspecific
Process categories: PROC4 - Use in batch and other process (synthesis) where opportunity for exposure arises

1.3. Details of the supplier of the safety data sheet
Halliburton Energy Services
Halliburton House, Howemoss Place
Kirkhill Industrial Estate
Dyce
Aberdeen, AB21 0GN
United Kingdom

www.halliburton.com
For further information, please contact
E-Mail address: fdunexchem@halliburton.com

1.4. Emergency telephone number
+44 8 08 189 0979 / 1-760-476-3961

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

<table>
<thead>
<tr>
<th>REGULATION (EC) No 1272/2008</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Corrosion / irritation</td>
<td>Category 1 B - (H314)</td>
</tr>
<tr>
<td>Serious Eye Damage / Eye Irritation</td>
<td>Category 1 - (H318)</td>
</tr>
</tbody>
</table>
Acute Aquatic Toxicity
Acute 1 - (H400)
Chronic Aquatic Toxicity
Chronic 2 - (H411)
Substances/mixtures corrosive to metal.
Category 1 - (H290)

2.2. Label Elements

Hazard Pictograms

Signal Word
Danger
Hazard Statements
H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H400 - Very toxic to aquatic life
H411 - Toxic to aquatic life with long lasting effects
EUH031 - Contact with acids liberates toxic gas

Precautionary Statements - EU (§28, 1272/2008)
P280 - Wear protective gloves/eye protection/face protection
P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/physician

Contains
Substances
Sodium hypochlorite
CAS Number
7681-52-9

2.3. Other Hazards
This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on Ingredients

3.2. Mixtures

<table>
<thead>
<tr>
<th>Substances</th>
<th>EINECS</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>EU - CLP Substance Classification</th>
<th>REACH No.</th>
</tr>
</thead>
</table>

For the full text of the H-phrases mentioned in this Section, see Section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation
If inhaled, move victim to fresh air and seek medical attention.

Eyes
Immediately flush eyes with large amounts of water for at least 30 minutes.
Skin

Seek prompt medical attention.
In case of contact, immediately flush skin with plenty of soap and water for at least 30 minutes and remove contaminated clothing, shoes and leather goods immediately. Get medical attention immediately.

Ingestion

Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2. Most Important symptoms and effects, both acute and delayed
Causes severe skin burns and eye damage. May cause mild respiratory irritation.

4.3. Indication of any immediate medical attention and special treatment needed
Notes to Physician Treat symptomatically

SECTION 5: Firefighting Measures

5.1. Extinguishing media

Suitable Extinguishing Media
Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons
None known.

5.2. Special hazards arising from the substance or mixture

Special Exposure Hazards
Releases oxygen at high temperatures. Decomposition in fire may produce harmful gases.

5.3. Advice for firefighters

Special Protective Equipment for Fire-Fighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Ensure adequate ventilation. Evacuate all persons from the area.
See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Neutralize to pH of 6-8. Scoop up and remove.

6.4. Reference to other sections
See Section 8 and 13 for additional information.

SECTION 7: Handling and Storage

7.1. Precautions for Safe Handling
Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Store away from acids. Store away from reducing agents. Store in a cool well ventilated area. Keep container closed when not in use.

7.3. Specific End Use(s)

Exposure Scenario No information available
Other Guidelines No information available

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters
Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EU</th>
<th>UK</th>
<th>Netherlands</th>
<th>France</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Germany</th>
<th>Spain</th>
<th>Portugal</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Italy</th>
<th>Poland</th>
<th>Hungary</th>
<th>Czech Republic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Denmark</th>
<th>Romania</th>
<th>Croatia</th>
<th>Cyprus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Derived No Effect Level (DNEL)

Worker

No information available.

General Population

Predicted No Effect Concentration (PNEC)

No information available.

8.2. Exposure controls

Engineering Controls

Use in a well ventilated area. Local exhaust ventilation should be used in areas without good cross ventilation.

Personal protective equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Acid gas respirator.

In high concentrations, supplied air respirator or a self-contained breathing apparatus.

Hand Protection


Skin Protection

Rubber apron.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

Eyewash fountains and safety showers must be easily accessible.

Environmental Exposure Controls

Do not allow material to contaminate ground water system

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Pungent</td>
</tr>
<tr>
<td>Color</td>
<td>Clear light yellow</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>11.2-11.4</td>
</tr>
<tr>
<td>Freezing Point/Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>&gt;100 °C / &gt;212 °F</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.14</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
</tbody>
</table>
Explosive Properties  
No information available

Oxidizing Properties  
No information available

9.2. Other information  
VOC Content (%)  
No data available

SECTION 10: Stability and Reactivity

10.1. Reactivity  
Not expected to be reactive.

10.2. Chemical Stability  
Stable

10.3. Possibility of Hazardous Reactions

Contact with acids liberates very toxic gas

10.4. Conditions to Avoid  
Keep away from heat, sparks and flame.

10.5. Incompatible Materials

Strong acids. Reducing agents. Contact with metals. Ammonium compounds.

10.6. Hazardous Decomposition Products


SECTION 11: Toxicological Information

11.1. Information on Toxicological Effects

Acute Toxicity

Inhalation  
May cause mild respiratory irritation.

Eye Contact  
Causes serious eye damage.

Skin Contact  
Causes severe burns.

Ingestion  
Causes burns of the mouth, throat and stomach.

Chronic Effects/Carcinogenicity  
No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

Toxicology data for the components

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>8200 mg/kg (Rat)</td>
<td>&gt; 10000 mg/kg (Rabbit)</td>
<td>&gt;5.25 mg/L (Rat)</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Did not cause sensitization on laboratory animals (guinea pig)</td>
</tr>
</tbody>
</table>

Eye damage/irritation

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Respiratory Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Mutagenic Effects

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mutagenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>In vivo tests did not show mutagenic effects.</td>
</tr>
</tbody>
</table>

Carcinogenic Effects

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Carcinogenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Did not show carcinogenic effects in animal experiments</td>
</tr>
</tbody>
</table>

Reproductive toxicity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Reproductive toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal</td>
</tr>
</tbody>
</table>
Substances | CAS Number | STOT - single exposure
---|---|---
Sodium hypochlorite | 7681-52-9 | May cause disorder and damage to the Respiratory system. Mucous Membrane Gastrointestinal tract (GI)

Substances | CAS Number | STOT - repeated exposure
---|---|---
Sodium hypochlorite | 7681-52-9 | No significant toxicity observed in animal studies at concentration requiring classification.

Substances | CAS Number | Aspiration hazard
---|---|---
Sodium hypochlorite | 7681-52-9 | Not applicable

### SECTION 12: Ecological Information

#### 12.1. Toxicity

**Ecotoxicity Effects**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>EC50 0.095 mg/L (Skeletonema costatum) EC50 (72h) 0.03565 mg/L (Pseudokirchnerella subcapitata)</td>
<td>LC50 0.06 - 0.11 mg/L (Pimephales promelas) LC50 (96h) 0.2 mg/L (Salmo gairdneri) NOEC (28d) 0.04 mg CPO/L (Menidia peninsulae)</td>
<td>EC50 (3h) 563 mg/L (Activated sludge, domestic)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
</tbody>
</table>

#### 12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>Log Kow = -3.42</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>7681-52-9</td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 12.5. Results of PBT and vPvB assessment

This mixture contains no substance considered to be persistent, bioaccumulating or toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

<table>
<thead>
<tr>
<th>Substances</th>
<th>PBT and vPvB assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

#### 12.6. Other adverse effects

**Endocrine Disruptor Information**

This product does not contain any known or suspected endocrine disruptors

### SECTION 13: Disposal Considerations

#### 13.1. Waste treatment methods

**Disposal Method**

Disposal should be made in accordance with federal, state, and local regulations. Follow all applicable national or local regulations.

**Contaminated Packaging**

#### SECTION 14: Transport Information
SODIUM HYPOCHLORITE SOLUTION

IMDG/IMO
UN Number: UN1791
UN Proper Shipping Name: Hypochlorite Solution (10% Available Chlorine)
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

RID
UN Number: UN1791
UN Proper Shipping Name: Hypochlorite Solution (10% Available Chlorine)
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

ADR
UN Number: UN1791
UN Proper Shipping Name: Hypochlorite Solution (10% Available Chlorine)
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

IATA/ICAO
UN Number: UN1791
UN Proper Shipping Name: Hypochlorite Solution (10% Available Chlorine)
Transport Hazard Class(es): 8
Packing Group: III
Environmental Hazards: Marine Pollutant

14.1. UN Number: UN1791
14.2. UN Proper Shipping Name: Hypochlorite Solution (10% Available Chlorine)
14.3. Transport Hazard Class(es): 8
14.4. Packing Group: III
14.5. Environmental Hazards: Marine Pollutant
14.6. Special Precautions for User: None
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories
EINECS Inventory: This product, and all its components, complies with EINECS
US TSCA Inventory: All components listed on inventory or are exempt.
Canadian DSL Inventory: All components listed on inventory or are exempt.

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

Germany, Water Endangering Classes (WGK)
WGK 2: Hazard to waters.

15.2. Chemical Safety Assessment
No information available

SECTION 16: Other Information

Full text of H-Statements referred to under sections 2 and 3
H272 - May intensify fire; oxidizer
H290 - May be corrosive to metals
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects
H411 - Toxic to aquatic life with long lasting effects
EUH031 - Contact with acids liberates toxic gas

Key or legend to abbreviations and acronyms
bw – body weight
CAS – Chemical Abstracts Service
EC – European Commission
EC10 – Effective Concentration 10%
EC50 – Effective Concentration 50%
EEC – European Economic Community
ErC50 – Effective Concentration growth rate 50%
IBC Code – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL0 – Lethal Loading 0%
LL50 – Lethal Loading 50%
MARPOL – International Convention for the Prevention of Pollution from Ships
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOHS – National Institute for Occupational Safety and Health
NOEC – No Observed Effect Concentration
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccumulative and Toxic
PC – Chemical Product category
PEL – Permissible Exposure Limit
ppm – parts per million
PROC – Process category
STEL – Short Term Exposure Limit
SU – Sector of Use category

Key literature references and sources for data
www.ChemADVISOR.com/

Revision Date: 29-Oct-2015
Revision Note
SDS sections updated: 9

This safety data sheet complies with the requirements of Regulation (EC) No. 453/2010

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End of Safety Data Sheet