MATERIAL SAFETY DATA SHEET

Product name: Sodium Bromide Solution
Product id: 2270SL
Revision date: 27/11/2012
Supersedes: 11/09/2009
Revision: 8

1. Identification of the substance & the company

Chemical name: Sodium bromide water solution
Type of product and use: For use in completion and oil drilling fluids and for industrial use
Company: Bromine Compounds Ltd
P.O.B 180, Beer Sheva 84101, Israel
Tel +972-8-6297830

Emergency telephone number:
- For Europe: (+31) 115 689000
- For UK and Ireland: +44 (0) 1270 502891 (24 Hours)
- For USA: Chemtrec (800) 424-9300
- For Asia - Pacific: ALERT-SGS
  24 hr Toll Free Number: +800 ALERTSGS (+800-2537-8747)
  24 hr Singapore Exchange Number: +65 6542-9595

2. Hazards identification

GHS classification
Product is not subject to classification according to GHS.
Not subject to labelling in accordance with Regulation (EC) No. 1272/2008 (CLP)

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>Weight %</th>
<th>Index No.</th>
<th>EC No.</th>
<th>EU Classification</th>
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<tr>
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### 4. First-aid measures

**Eye contact**  
Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 20 minutes. Get medical attention immediately.

**Skin contact**  
Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use. Get medical attention if irritation occurs.

**Inhalation**  
In case of mist inhalation or breathing fumes released from heated material, remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

**Ingestion**  
If swallowed, wash mouth thoroughly with plenty of water. Get medical attention immediately.  

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NOTE: Never give an unconscious person anything to drink
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**Notes to the physician**  
No specific antidote  
Treat symptomatically and supportively.

### 5. Fire - fighting measures

**Suitable extinguishing media**  
Material is not combustible. Use extinguishing media appropriate to surrounding fire conditions.

**Fire fighting procedure**  
Cool containers with water spray. In closed stores, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.

**Unusual fire and explosion hazards**  
Will decompose from ca. 800°C releasing poisonous and corrosive fumes of bromine, hydrogen bromide and sodium oxide.

### 6. Accidental release measures

**Personal precautions**  
See section "Exposure controls/personal protection".

**Methods for cleaning up**  
Absorb on sand or vermiculite and place in closed container for disposal.
7. Handling and storage

Handling
Avoid bodily contact. Keep containers tightly closed.

Storage
Keep in a well-ventilated place away from incompatible materials (see "materials to avoid").

8. Exposure controls / personal protection

Exposure Limits:

<table>
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<th>Components</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
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<td>Sodium Bromide</td>
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</table>

Ventilation requirements
Provide adequate ventilation

Use local exhaust as necessary, especially under mist conditions.

Personal protective equipment:
- Respiratory protection
  Not required; except in case of aerosol formation.
- Hand protection
  Protective gloves
- Eye protection
  Chemical safety goggles
- Skin and body protection
  Body covering clothes and boots

Hygiene measures
Wash hands thoroughly after handling and before eating or smoking. Do not eat, smoke or drink where material is handled, processed or stored. Safety shower and eye bath should be provided.

9. Physical and chemical properties

Appearance
Colourless liquid, odourless

Melting point/range
Not available

Flash point
None

Flammable/Explosion limits
Not available

Auto-ignition temperature
Not applicable

Vapour pressure
Not applicable

Evaporation rate (ether=1)
As of water

Vapor density
Not available

Solubility:
- Solubility in water
  94.6 gr/100ml at 25°C (NaBr 100%)
- Solubility in other solvents
  methanol: 14.8 g/100g at 25°C
  ethanol: 95%: 7 g/100g at 25°C

Density
1.38-1.508 g/ml (20 °C)

pH
Not determined
10. Stability and reactivity

Stability: Stable under normal conditions
Conditions to avoid: Heating above decomposition temperature
Hazardous decomposition products: Hydrogen bromide and sodium oxide
Hazardous polymerization: Will not occur

11. Toxicological information

Acute toxicity:
- Rat oral LD50: >5000 mg/kg (NaBr 46%)
- Rat dermal LD50: >2000 mg/kg (NaBr 46%)
- Rat inhalation LC50: Not available
- Dermal irritation (rabbit): Not irritant (NaBr 46%)
- Eye irritation (rabbit): Moderate irritant (NaBr 46%)

Dermal sensitization: Not a sensitizer.

Effects of overexposure:
- Ocular: Mild irritant
- Dermal: Not irritant to intact skin. Slightly irritant on prolonged contact to abraded skin.
- Inhalation: Irritant to upper respiratory tract.
- Ingestion: Abdominal pain, nausea and vomiting. May cause falling asleep, muscular incoordination and respiratory depression.

Chronic toxicity: Repeated skin contact may cause dermatitis
Repeated oral intake of bromides (>9 mg/kg body weight/day) may affect the central nervous system. Warning symptoms include mental dullness, slurred speech, weakened memory, apathy, anorexia, constipation, drowsiness and loss of sensitivity to touch and pain.

Mutagenicity: Does not induce DNA repair in cultured human epithelioid cells
Not clastogenic in human lymphocytes metaphase analysis
Not mutagenic by the Ames Test

Carcinogenicity: Not classified by IARC
Not included in NTP 12th Report on Carcinogens
Reproductive toxicity
Sodium bromide has been shown to cause embryo-fetal toxicity and malformations in rats at dose levels which also produce maternal toxicity. The No-Observed Effect Level (NOEL) is 100 mg/kg/day, and the Acceptable Daily Intake (ADI) for sodium bromide from food and drinking water in humans is 1 mg/kg/day. Comparable high doses of sodium chloride (table salt) similarly cause malformations, embryo-fetal toxicity, and maternal toxicity in mice.

Teratogenicity
In the oral developmental toxicity study in rabbits, the NOAEL (No Observed Adverse Effect Level) for maternal toxicity and the NOEL (No Observed Effect Level) for developmental toxicity were considered to be 250 mg/kg/day

12. Ecological information

Environmental fate
NaBr is an inorganic salt, which fully dissociates in aquatic environment to bromide and sodium ions. It also undergoes degradation in soil to bromide ion (no further degradation or biodegradation will occur).

Aquatic toxicity:
- 96 Hour-LC50, Fish >1000 mg/l (rainbow trout)
  >1000 mg/l (bluegill sunfish)
  >1000 mg/l (juvenile turbot) (NaBr 44%)
- 72 hour - EC50, Marine algae >1000 mg/l (Skeletonema costatum) (NaBr 44%)
- 48 Hour-EC50,Marine Invertebrate >2000 mg/l (Acartia tonsa)
- 48 Hour-EC50, Daphnia magna >1000 mg/l

Avian toxicity:
- Oral LD50, Bobwhite quail >2250 mg/kg
- Dietary LC50, Mallard duck >5633 ppm
- Dietary LC50, Bobwhite quail >5633 ppm

Toxicity to micro-organisms
Activated sewage sludge respiration inhibition test: EC50 > 1000 mg/l (3 hours). NOEC was 1000 mg/l (3 hours)

13. Disposal considerations

Waste disposal
Observe all federal, state and local environmental regulations when disposing of this material.
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<table>
<thead>
<tr>
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<td>2270SL</td>
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<td>Supersedes</td>
<td>11/09/2009</td>
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14. Transportation information

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15. Regulatory information

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</tbody>
</table>

16. Other information

This data sheet contains changes from the previous version in section(s) 1, 2(ROW), 4, 8, 11, 12, 13

Health, Safety & Environment Policy
We will strive to ensure that our operations and products meet the needs of the present global community without compromising the ability of future generations to meet their needs. We accept that the success of our business is dependent on the supply of products and services that will benefit society whilst ensuring human safety and protection of the environment and natural resources. Within the framework of our commitment to the Responsible Care program, we will provide a healthy and safe work environment for employees and will responsibly manage our products at all stages of their life cycle in order to protect human health and the environment whilst maintaining high production standards of operation.
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TO MEET THIS COMMITMENT WE WILL: Comply with or exceed applicable national and international regulatory requirements and other requirements to which we subscribe. Communicate openly and actively encourage dialogue with employees, customers and community concerning our products and operations. Implement documented management systems consistent with and for promotion of the Responsible Care ethics.

Develop and supply products that can be manufactured, transported, used and disposed of safely whilst best meeting the needs of our customers. Regularly assess, continually improve and responsibly manage health, safety and environmental risks associated with products and processes throughout their life-cycles. Share knowledge and expertise with others and seek to learn from and incorporate improved practices into our own operations.

Educate and train employees, contractors and customers to improve their HSE performance. Communicate up-to-date information to enable our workers, customers and other interested parties to handle our products in a safe and environmentally responsible manner. Endeavor to work with customers, suppliers, distributors and contractors to foster the safe use, transport and disposal of our chemicals. Support Product Stewardship programs in cooperation with customers, distributors and transporters.

Although the information and recommendations set forth herein (hereinafter "information") are presented in good faith and believed to be correct as of the date hereof, Bromine Compounds Ltd. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its safety and suitability for their purposes prior to use. In no event will Bromine Compounds Ltd. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE, ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH THE INFORMATION REFERS.

In an event of discrepancy between the contents of this MSDS and the English version of it, the English version shall prevail.

Prepared by
HERA Division in ISRAEL
telephone: +/972-8-6297835
telefax: +/972-8-6297832
www.icl-ip.com
e-mail:msdsinfo@icl-ip.com

End of safety data sheet