MATERIAL SAFETY DATA SHEET

Product Name: Sodium Bromide Biocide

Product id: 2270B

Revision date: 05/03/2009

Supersedes: 03/01/2006

1. Identification of the substance & the company

Chemical name: Sodium bromide

Chemical formula: NaBr

Chemical family: Inorganic bromide

Molecular weight: 102.9

Type of product and use: Biocide for industrial water treatment and for swimming pools

Supplier: Clearon Corp.
95 MacCorkle Ave. SW, South Charleston, WV 25303, USA
Tel: (304) 746-3000

Emergency Telephone: Chemtrec (800)424-9300

2. Hazards identification

Emergency overview: White, odourless, crystalline solid
None under recommended use instructions

Potential Health Effects:
- Eye Contact: Mild irritant
- Skin contact: 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 effects/Carcinogenicity: Repeated skin contact may cause dermatitis.

3. Composition / information on ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Bromide</td>
<td>7647-15-6</td>
<td>98</td>
</tr>
</tbody>
</table>
4. First-aid measures

Eye contact
Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advise.

Skin contact
Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advise.

Inhalation
Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advise.

Ingestion
Call poison control center, or doctor immediately for treatment advise. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

Note to physician
Probable mucosal damage may contraindicate the use of gastric lavage.

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 hydrogen bromide and sodium oxide.

6. Accidental release measures

Personal precautions
Wear respirator, chemical safety goggles, rubber gloves and boots.

Methods for cleaning up
Sweep up, place in a bag and hold for waste disposal or possible re-use. Ventilate area and wash spill site after material pickup is complete.
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>
<thead>
<tr>
<th>Components</th>
<th>ACGIH-TLV Data</th>
<th>OSHA (PEL) Data</th>
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</thead>
<tbody>
<tr>
<td>Sodium Bromide 7647-15-6</td>
<td>Not determined</td>
<td>Not determined</td>
</tr>
</tbody>
</table>

Ventilation requirements
Provide adequate ventilation.

Personal protective equipment:
- Respiratory protection: Dust respirator
- Hand protection: Protective gloves
- Eye protection: Chemical safety goggles
- Skin and body protection: Body covering clothes and boots

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

9. Physical and chemical properties

Appearance
White, odourless, crystalline solid

Melting point/range
755°C

Boiling point/range
1390°C

Flash point
None

Flammable/Explosion limits
Not flammable

Auto-ignition temperature
Not applicable

Vapour pressure
1 mmHg (806°C)

Vapor density
Not applicable under standard conditions

Evaporation rate (ether=1)
Not applicable under standard conditions

Solubility:
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- Solubility in water: 94.6 gr/100ml at 25°C
- Solubility in other solvents: ethanol: 95%: 7 g/100g at 25°C  methanol: 14.8 g/100g at 25°C
Specific gravity: 3.203
Partition coefficient (n-octanol/water): Not applicable since this material is almost completely soluble in water.

10. Stability and reactivity

Stability: Stable under normal conditions. The powder product tends to cake under normal storage 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: 4200 mg/kg
- Rabbit dermal LD50: >2000 mg/kg
- Rat dermal LD50: >2000 mg/kg
- Eye irritation (rabbit): Slightly irritant
- Dermal irritation (rabbit): Not irritant

Dermal sensitization: Not a sensitizer

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 11th 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 gavage pre-natal developmental toxicity study in the Rabbit, there were no obvious effects of maternal treatment on the survival, growth or development of the offspring at any of the dosages investigated. The No Observed Effect Level (NOEL) for the developing conceptus was 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)

- **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

#### Persistence and degradability
Activated sewage sludge respiration inhibition test: EC50 > 1000 mg/l (3 hours). NOEC was 1000 mg/l (3 hours)

#### Bioaccumulative potential
Bioaccumulation is not likely to occur since this material is highly soluble in water.

### Germany, water endangering classes (WGK)
1

### 13. Disposal considerations

#### Waste disposal
Add into a large vessel containing water and drain into sewer with ample water. Avoid access to streams, lakes or ponds. Observe all federal, state and local environmental regulations when disposing of this material.
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</table>

## 14. Transportation information

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<tr>
<td>IMO</td>
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<tr>
<td>ICAO/IATA</td>
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## 15. Regulatory information

<table>
<thead>
<tr>
<th>USA</th>
<th>Reported in the EPA TSCA Inventory.</th>
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<tbody>
<tr>
<td>Canada</td>
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<td>WHMIS hazard class</td>
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<td>New Zealand Inventory</td>
<td>Listed in NZIoC</td>
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<td>China inventory</td>
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<td>Korea</td>
<td>Listed in ECL (KE-31368)</td>
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<tr>
<td>Philippines</td>
<td>Listed in PICCS</td>
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</table>

## 16. Other information

This data sheet contains changes from the previous version in section(s) 9, 11, 12, 15
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16. Other information

Further information
The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product.
This information has been prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product.
Additionally, if this Material Safety Data Sheet is more than three years old, you should contact Clearon at the phone number listed below to make certain that this sheet is current.

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

Prepared by
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Phone number: (304) 746-3000

End of safety data sheet