1. Identification of the Substance/Mixture and of the Company/Undertaking:

1.1 Product Identifier: Lithium Bromide Solution, Uninhibited
1.1.1 Substances: Not applicable
1.1.2 Mixture name: Lithium Bromide Solution, Uninhibited

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:
- Industrial Manufacturing
- Only to be supplied for industrial uses
- Do not use for private purposes (household).

1.3 Details of the Supplier of the Safety Data Sheet

North America
FMC Corporation
2801 Yorkmont Road, Suite 300
Charlotte, NC 28208
Phone: +1.704.426.5300
Fax: +1.704.426.5370
1.888.lithium
Email: lithium.info@fmc.com
Web: www.fmc-lithium.com

Europe
FMC Chemicals
Commercial Road
Bromborough, Merseyside
CH62 3NL, England
Phone: +44.151.334.8085
Fax: +44.151.482.7361

Asia Pacific
FMC Asia Innovation Center
No 3 Building No. 4560
Jinke Road
Shanghai, China 201203
T: +86.21.2067.5888

1.4 Emergency Telephone Number:

North America
CHEMTREC: +1.800.424.9300
+1.703.527.3887
Plant: +1.704.629.5361
Medical: +1.303.595.9048

Europe
24 hr Specialist advice number:
CHEMTREC: +44 870 8200418

Asia Pacific
Phone: +86.21.2067.5888

2. Hazards Identification

2.1 Classification of the Substance or mixture:
2.1.1 GHS Classification [EC Regulation No 1272/2008 and US OSHA regulations]
- Acute Toxicity, Category 4
- Eye Irritant, Category 2
- Skin irritant, Category 2
- Skin sensitization, Category 1

2.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]
- Xn, R22; Xi, R36/38, R43

2.2 Label Elements:
2.2.3 Hazard Pictograms(s):

2.2.4 Signal Word:
- Warning

Hazard Statement(s):
- Harmful if swallowed H302
- Causes serious eye irritation H319
- Causes skin irritation H315
- May cause an allergic skin reaction H317

Precautionary Statement(s):
- Wear protective gloves/protective clothing/eye protection/face protection. P280
- IF IN EYES: Rinse cautiously w/ water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P305 + P351 + P338
- If eye irritation persists: Get medical advice/attention. P337 + P313
- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P301 + P312
- IF ON SKIN: Wash with plenty of soap and water. P302 + P352
- If skin irritation occurs: Get medical advice/attention. P332 + P313
Additional Precautionary Statements(s):

- Contaminated work clothing should not be allowed out of the workplace. P272
- Wash contaminated clothing before reuse. P363
- Avoid breathing dust/fume/gas/mist/vapours/spray. P261
- Wash hands thoroughly after handling. P264
- Do not eat, drink or smoke when using this product. P270
- Take off contaminated clothing and wash before reuse P362
- Dispose of contents/ container to an approved waste disposal plant. P501

2.3 Other Hazards

None.

3. Composition / Information on Ingredients

3.1 Substances

Not applicable.

3.2 Mixtures

3.2.1 GHS Classification [EC: Regulation No 1272/2008; US: OSHA regulations]

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>EC No</th>
<th>EC Index No</th>
<th>REACH Reg No</th>
<th>Wt.%</th>
<th>Classification, Hazard Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithium bromide</td>
<td>7550-35-8</td>
<td>231-439-8</td>
<td>None</td>
<td>01-2119970708-24-0000</td>
<td>52-56</td>
<td>Acute tox 4 H 302 Skin Irrit 2 H315 Eye Irrit 2 H319 Skin Sens 1 H317</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>44-48</td>
<td>None</td>
</tr>
</tbody>
</table>

3.2.2 EC: Classification according to 67/548/EEC or 1999/45/EC [DSD/DPD]

<table>
<thead>
<tr>
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<th>REACH Reg No</th>
<th>Wt.%</th>
<th>Classification, Hazard Phrases</th>
</tr>
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<tr>
<td>Lithium bromide</td>
<td>7550-35-8</td>
<td>231-439-8</td>
<td>None</td>
<td>01-2119970708-24-0000</td>
<td>52-56</td>
<td>Xn R22</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>44-48</td>
<td>Xi R 36/38 R43</td>
</tr>
</tbody>
</table>

(see Section 16 for abbreviations and R-phrase text)

4. First Aid Measures

4.1 Description of First Aid Measures

**EYES:** Immediately flush with water for at least 15 minutes, lifting the upper and lower eyelids intermittently. See a medical doctor or ophthalmologist immediately.

**SKIN:** Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain medical attention if signs of irritation or ill-health.

**INGESTION:** Quickly wipe material from the mouth and rinse mouth with water. Do not induce vomiting unless under medical supervision. Obtain medical attention if signs of irritation or ill-health.

**INHALATION:** Remove to fresh air. If breathing discomfort occurs and persists, see a medical doctor.

4.2 Most Important Symptoms and effects, both acute and delayed

Symptoms of over-exposure will typically be a result of the irritant nature of the substance with discomfort to skin and if swallowed, local effects with discomfort to the mouth and GI tract.

4.3 Indication of any immediate medical attention and special treatment needed.

**Notes to medical doctor:**

Product is irritant to the eyes, skin and mucous membranes. Treatment is controlled removal of exposure followed by symptomatic and supportive care.
5. Fire-Fighting Measures

5.1 Extinguishing media
Dry chemical, CO2, water spray or regular foam.

5.2 Special hazards arising from the substance or mixture

| Hazardous combustion products | None. Not combustible. |
| General Hazard               | No known physical hazard, non-combustible. |
| Properties contributing to   | Not flammable |
| Flammability                 | Not applicable |
| Flammable limits in air      | Not applicable |
| Auto ignition temperature    | Not applicable |
| Sensitivity to static discharge | Not applicable |
| Sensitivity to static impact | Not applicable |

5.3 Advice for fire-fighters
Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures
Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.

6.2 Environmental precautions
Contain spill. Do not wash into drains. Dispose of at qualified waste disposal facility.

6.3 Methods and material for containment and cleaning up
Contain spill with absorbant. Sweep up and place in approved transport container. Dispose of waste according to local and Federal laws and regulations.

6.4 Reference to other sections
Before cleanup measures begin, review the entire SDS with particular attention to Section 2, Hazards Identification; and Section 8, Exposure Controls/Personal Protection.

6.5 Additional information
Not specified.

7. Handling and Storage

7.1 Precautions for safe handling
Avoid contact with eyes, skin or clothing. Avoid breathing mist. Use with adequate ventilation. Wear safety glasses or goggles and rubber gloves. Wash thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities
Keep away from strong acids. Keep container closed. This product does not contain a corrosion inhibitor and therefore may corrode steel and stainless steel containers and equipment.

7.3 Specific end use(s)
Defined in Exposure scenarios. Industrial and professional use only.

8. Exposure Controls / Personal Protection

8.1 Control parameters

Lithium bromide

DNEL
Long-term exposure, systemic, inhalation 3.8 mg/m³
Long-term exposure, systemic, dermal 10.9 mg/kg/day

PNEC
PNEC aqua (freshwater) 21.3 mg/l
PNEC STP 287 mg/l

EXPOSURE LIMITS
8.2 Exposure controls

**Engineering controls:**
Use local exhaust ventilation to keep airborne concentrations below exposure limits.

**Personal protective equipment**

**Eyes and Face:** Safety glasses or goggles.

**Respiratory:** When engineering controls are not adequate, wear a respirator approved for protection against inorganic dusts. US: NIOSH or MSHA approved

**Protective Clothing:**

**Gloves:** Nitrile/Neoprene/PVC/Natural Rubber (permeation breakthrough not detected during 6 hr test)

These glove recommendations should not be used as the absolute basis for glove selection. Actual in-use conditions may vary glove performance from the controlled conditions of laboratory tests. Factors such as concentration and temperature, glove thickness and glove reuse, may affect performance. Other glove requirements, such as length, dexterity, cut, abrasion, puncture and snag resistance, or glove grip need to be considered in making your final selection.

**Other:** Not specified.

**Work Hygienic Practices:**

Quick-drench eyewash and safety shower.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance:</strong></td>
<td>Clear, colorless liquid</td>
</tr>
<tr>
<td><strong>Odor:</strong></td>
<td>Odorless</td>
</tr>
<tr>
<td><strong>Odor threshold:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>(1% solution) @ 25°C: 9</td>
</tr>
<tr>
<td><strong>Melting point:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Boiling point:</strong></td>
<td>140°C (284°F)</td>
</tr>
<tr>
<td><strong>Flash point:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation rate (butyl acetate = 1):</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flammability:</strong></td>
<td>Not flammable</td>
</tr>
<tr>
<td><strong>Flammable limits:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapor pressure:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapor density (air = 1):</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Specific gravity:</strong></td>
<td>3.5 g/cc</td>
</tr>
<tr>
<td><strong>Solubility in water:</strong></td>
<td>Miscible in any proportion</td>
</tr>
<tr>
<td><strong>Partition coefficient n-octanol/water:</strong></td>
<td>Not applicable. No components considered to be soluble in octanol</td>
</tr>
<tr>
<td><strong>Autoignition 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>Not available</td>
</tr>
<tr>
<td><strong>Explosive properties:</strong></td>
<td>Not explosive</td>
</tr>
<tr>
<td><strong>Oxidizing properties:</strong></td>
<td>Not an oxidizer</td>
</tr>
</tbody>
</table>

9.2 Other information

- **Self-reactive properties:** Does not meet classification criteria.
- **Pyrophoric properties:** Does not meet classification criteria.
- **Self-heating properties:** Does not meet classification criteria.
- **Water reactive properties:** Does not meet classification criteria.
- **Corrosive to metals:** Does not meet classification criteria.
- **Molecular weight:** 86.84 (LiBr)

10. Stability and Reactivity

10.1 Reactivity

Reacts with acids to form hydrogen bromide. Not reactive with
10.2 Chemical stability
Stable.

10.3 Possibility of hazardous reaction
Hazardous polymerization will not occur.

10.4 Conditions to avoid
Contact with acids

10.5 Incompatible materials
Acids

10.6 Hazardous decomposition products
None

11. Toxicological Information

11.1 Information on toxicological effects
The mixture has not been tested, but properties can be predicted based on the properties of the two components.

(a) acute toxicity
Lithium bromide discriminating acute oral dose > 500 mg/kg
Lithium bromide solution (ca 50%) acute inhalation toxicity > 15.57 mg/l
Lithium bromide discriminating acute dermal > 2000 mg/kg

(b) skin corrosion/irritation
Classified as irritant to skin on the basis of lithium bromide

(c) serious eye damage/irritation
Classified as irritant to eyes on the basis of lithium bromide

(d) respiratory/skin sensitisation
Classed as sensitizer to skin on the basis of lithium bromide

(e) germ cell mutagenicity
None of the components considered to be mutagenic.

(f) carcinogenicity
None on the components considered to be carcinogenic

(g) reproductive toxicity
None on the components suspected of damaging fertility or the unborn child.

(h) STOT-single exposure
None on the components considered to cause organ damage

(i) STOT-repeated exposure
None on the components considered to cause organ damage

(j) aspiration hazard
Lithium bromide in aqueous solution, does not present an aspiration hazard.

Lithium bromide has been extensively tested for REACH registration.

Acute Effects From Overexposure:
No data available for the formulation.
No envisaged effects other than acute effects from local irritation

Chronic Effects From Overexposure:
No data available for product.

Carcinogenicity Listings
EH40: Not listed.
IARC: Not listed.
NTP: Not listed.
OSHA: Not considered a carcinogen under OSHA.
ACGIH: Not listed.

12. Ecological Information

12.1 Toxicity:
The mixture has not been tested, but properties can be predicted based on the properties of lithium bromide.
Fish 96h LC50 estimated > 800 mg/L (trout)
Aquatic invertebrate 48h EC50 estimated > 500 mg/L (daphnia)
Plant 96h LC50 estimated > 500 mg/l (algae)
Sludge inhibition, 3h EC50 > 200 mg/l

12.2 Persistence and degradability
Inorganic salt.

12.3 Bioaccumulative potential
Inorganic. Lithium salts are not bioaccumulative

12.4 Mobility in soil
Not expected to be mobile.

12.5 Results of PBT and vPvB assessment
Inorganic
12.6 **Other adverse effects**
Due to the nature of the material and the specialist applications, this product is not considered to be a risk to the environment.

13. Disposal Considerations

13.1 **Waste treatment methods**
**Disposal method:**
- Do not discharge to waste water systems.
- Dispose of waste according to local and national laws and regulations.

14. Transport Information

14.1 **UN Number**
Not classified

14.2 **UN proper shipping name (IMDG, ICAO, ADR, DOT)**
None

14.3 **Transport hazard class(es) (IMDG, ICAO, ADR, DOT)**
None

14.4 **Packing group (IMDG, ICAO, ADR, DOT)**
None

14.5 **Environmental hazards**
None

14.6 **Special precautions for user**
None

14.7 **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
None

15. Regulatory Information

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

**EUROPEAN UNION:**

German Wassergefährdungsklasse (water hazard class)
Lithium bromide 1

**UNITED STATES:**

*Section 311 Hazard Category (40 CFR 370):*
Immediate (acute) health hazard,
This product does not contain a toxic chemical subject to the reporting requirements of Section 313 of Emergency Planning and Community Right-To-Know Act of 1986.

*Section 313 Reportable Ingredients (40 CFR 372):*
Not listed

*Section 302 Extremely Hazardous Substances (40 CFR 302.4):*
Not listed

*CERCLA Hazardous Substance (40 CFR 302.4):*
This product is not subject to TSCA 12 (b) Export Notification Requirements.

**NFPA Rating:**
Health: 1 Flammability: 0 Reactivity: 0 Special: None

**INTERNATIONAL INVENTORY STATUS:**

<table>
<thead>
<tr>
<th>Inventory/Country</th>
<th>Product Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>EINECS (EU)</td>
<td>Listed</td>
</tr>
<tr>
<td>TSCA (US)</td>
<td>Listed</td>
</tr>
<tr>
<td>ECL (Korea)</td>
<td>Listed</td>
</tr>
<tr>
<td>DSL (Canada)</td>
<td>Listed</td>
</tr>
</tbody>
</table>

15.2 **Chemical Safety Assessment**
A Chemical Safety Assessment has been carried out for lithium bromide

16. Other Information
European Union:

R Phrases:

R22 Harmful if swallowed.
R36/38 Irritating to eyes and skin.
R43 May cause sensitisation by skin contact

List of Abbreviations used in this SDS:

PBT Persistent, Bioaccumulative and Toxic
vPvB very Persistent, very Bioaccumulative
PEC Predicted environmental concentration
PNEC Predicted no effect concentration
DNEL Derived no effect level

Specific uses identified for Exposure Scenarios

ES1 Manufacture of fine chemicals and pharmaceutical synthesis
ES2 Industrial use of substances in closed systems - Absorption Chillers
ES3 Professional use of substances in closed systems - Absorption Chillers

REVISION SUMMARY: Revision # 0. New SDS.

This SDS has been prepared to meet E U. S. OSHA Hazard Communication Standard requirements.
type 1a
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