1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Red-Al® sodium bis(2-methoxyethoxy)aluminum hydride solution
Product Number: 196193
Brand: Aldrich
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA
Telephone: +1 800-325-5832
Fax: +1 800-325-5052
Emergency Phone #: (314) 776-6555

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Water Reactive, Toxic by ingestion, Toxic by skin absorption, Corrosive, Target Organ Effect, Teratogen, Reproductive hazard

Target Organs
Bladder, Liver, Kidney, Brain.

GHS Label elements, including precautionary statements

Pictogram

Signal word  Danger

Hazard statement(s)
H225  Highly flammable liquid and vapour.
H301 + H311  Toxic if swallowed or in contact with skin.
H304  May be fatal if swallowed and enters airways.
H315  Causes skin irritation.
H319  Causes serious eye irritation.
H331  Toxic if inhaled.
H336  May cause drowsiness or dizziness.
H361  Suspected of damaging fertility or the unborn child.
H371  May cause damage to organs.
H401  Toxic to aquatic life.

Precautionary statement(s)
P210  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260  Do not breathe dust/fume/gas/mist/vapours/spray.
P280  Wear protective gloves/protective clothing.
P301 + P310  IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311  Call a POISON CENTER or doctor/physician.
P331  Do NOT induce vomiting.

HMIS Classification
Health hazard: 3
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 2

NFPA Rating
Health hazard: 3
Fire: 3
Reactivity Hazard: 2
Special hazard: W

Potential Health Effects

Inhalation
May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Vapours may cause drowsiness and dizziness.

Skin
Toxic if absorbed through skin. Causes skin burns.

Eyes
Causes eye burns.

Ingestion
Toxic if swallowed. Causes burns. Aspiration hazard if swallowed - can enter lungs and cause damage.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Vitride®, Sodium bis(2-methoxyethoxy) aluminum hydride solution SBAH Sodium dihydrido-bis(2-methoxyethoxy)aluminate Sodium bis(2-methoxyethoxy)aluminum dihydride

Formula: $C_6H_{16}AlNaO_4$

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium dihydridobis(2-methoxyethanolato)aluminate(1-)</td>
<td>22722-98-1</td>
<td>245-178-2</td>
<td>&gt;= 65 - &lt;= 70 %</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>203-625-9</td>
<td>601-021-00-3</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Carbon dioxide (CO2) Dry powder

Extinguishing media which shall not be used for safety reasons
Water

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Do not flush with water.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place. Never allow product to get in contact with water during storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>TWA</td>
<td>100 ppm 375 mg/m³</td>
<td>1989-01-19</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>150 ppm 560 mg/m³</td>
<td>1989-01-19</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>200 ppm</td>
<td>1997-08-04</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z2</td>
</tr>
<tr>
<td>Remarks</td>
<td>Z37.12-1967</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CEIL</td>
<td>300 ppm</td>
<td>1997-08-04</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z2</td>
</tr>
<tr>
<td></td>
<td>Z37.12-1967</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peak</td>
<td>500 ppm</td>
<td>1997-08-04</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z2</td>
</tr>
<tr>
<td></td>
<td>Z37.12-1967</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>20 ppm</td>
<td>2008-01-01</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Visual impairment Female reproductive Pregnancy loss 2008 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of a lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.
Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves.

Eye protection
Tightly fitting safety goggles. Faceshield (8-inch minimum).

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
- Form: liquid
- Colour: light yellow

Safety data
- pH: no data available
- Melting point: no data available
- Boiling point: 110 °C (230 °F)
- Flash point: 4 °C (39 °F) - closed cup
- Ignition temperature: no data available
- Lower explosion limit: 1.27 %(V)
- Upper explosion limit: 7 %(V)
- Vapour pressure: 28 hPa (21 mmHg) at 20 °C (68 °F)
- Density: 1.036 g/mL at 25 °C (77 °F)
- Water solubility: no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Vapours may form explosive mixture with air. Reacts violently with water.

Conditions to avoid
Heat, flames and sparks. Exposure to moisture.

Materials to avoid
Water, Oxidizing agents, Combustible material

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Hydrogen gas, Carbon oxides, Aluminum oxide, Sodium oxides
Reacts with water to form: - Hydrogen gas

Thermal decomposition
205 °C
11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
LD50 Oral - rat - > 50 mg/kg
LD50 Dermal - rabbit - > 200 mg/kg

**Skin corrosion/irritation**
Skin - rabbit - Severe skin irritation

**Serious eye damage/eye irritation**
Eyes: no data available

**Respiratory or skin sensitization**
no data available

**Germ cell mutagenicity**
no data available

**Carcinogenicity**
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**
no data available

**Specific target organ toxicity - single exposure (GHS)**
no data available

**Specific target organ toxicity - repeated exposure (GHS)**
no data available

**Aspiration hazard**
no data available

**Potential health effects**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>Inhalation</td>
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<td>Ingestion</td>
<td>Toxic if swallowed. Causes burns. Aspiration hazard if swallowed - can enter lungs and cause damage.</td>
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<tr>
<td>Skin</td>
<td>Toxic if absorbed through skin. Causes skin burns.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye burns.</td>
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</table>

**Signs and Symptoms of Exposure**
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Additional Information**

12. ECOLOGICAL INFORMATION

**Toxicity**
no data available

**Persistence and degradability**
no data available

**Bioaccumulative potential**
13. DISPOSAL CONSIDERATIONS

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 3399  Class: 4.3 (3)  Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable (Sodium dihydridobis(2-methoxyethanolato)aluminate(1-))
Reportable Quantity (RQ): 2857 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 3399  Class: 4.3 (3)  Packing group: I  EMS-No: F-G, S-N
Proper shipping name: ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (Sodium dihydridobis(2-methoxyethanolato)aluminate(1-))
Marine pollutant: No

IATA
UN-Number: 3399  Class: 4.3 (3)  Packing group: I
Proper shipping name: Organometallic substance, liquid, water-reactive, flammable (Sodium dihydridobis(2-methoxyethanolato)aluminate(1-))
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Water Reactive, Toxic by ingestion, Toxic by skin absorption, Corrosive, Target Organ Effect, Teratogen, Reproductive hazard

DSL Status
All components of this product are on the Canadian DSL list.

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>2007-07-01</td>
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SARA 311/312 Hazards
Fire Hazard, Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
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### New Jersey Right To Know Components

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### California Prop. 65 Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.</td>
<td>108-88-3</td>
<td>2007-09-28</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

### 16. OTHER INFORMATION

**Further information**

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