SAFETY DATA SHEET

1. Identification

Product identifier POTASSIUM HYDROXIDE, 30-55%

Other means of identification

   Synonyms
   Caustic potash, potassium lye, potassium hydrate

   Recommended use
   Potassium source, pH neutralizer, manufacturer of inorganic potassium chemicals, manufacturer of deicer, Manufacture of liquid fertilizers, Herbicides, Pesticides and other agriculture chemicals

   Recommended restrictions
   None known.

Manufacturer/Importer/Supplier/Distributor information

Company name Olin Chlor Alkali Products
Address 490 Stuart Road, NE
          Cleveland, TN  37312

Company name Pioneer Americas, LLC (d/b/a Olin Chlor Alkali Products)
Address 490 Stuart Road, NE
          Cleveland, TN  37312

Company name Olin Canada ULC (d/b/a Olin Chlor Alkali Products)
Address 2020 Robert-Bourassa Blvd., Suite 2190
          Montreal, Quebec H3A 2A5

General Information

   Telephone (888) 658-6SDS (737)
   Website olinchloralkali.com
   Contact person ORC SDS Control Group
   Emergency phone number CHEMTREC
          US:  1-800-424-9300                         Canada:  1-800-567-7455

2. Hazard(s) identification

   Physical hazards Corrosive to metals Category 1
   Health hazards Acute toxicity, oral Category 4
   Skin corrosion/irritation Category 1B
   Serious eye damage/eye irritation Category 1
   Environmental hazards Hazardous to the aquatic environment, acute hazard Category 3
   OSHA defined hazards Not classified.

Label elements

   Signal word Danger
   Hazard statement Harmful if swallowed. May be corrosive to metals. Causes severe skin burns and eye damage. Harmful to aquatic life.
   Precautionary statement Prevention
          Keep only in original container. Wear protective gloves/protective clothing/eye protection/face protection. Do not eat, drink or smoke when using this product. Do not breathe mist or vapor. Wash thoroughly after handling. Avoid release to the environment.
Response
If swallowed: Rinse mouth. Do NOT induce vomiting. If inhaled: Remove person to fresh air and keep comfortable for breathing. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. Wash contaminated clothing before reuse. Absorb spillage to prevent material damage.

Storage
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)
None known.

Supplemental information
None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hydroxide</td>
<td>1310-58-3</td>
<td>30-55</td>
</tr>
</tbody>
</table>

Composition comments
Components not listed are either non-hazardous or are below reportable limits.

4. First-aid measures

Inhalation
Move to fresh air. Get medical attention if symptoms occur.

Skin contact
Take off immediately all contaminated clothing. Wash off IMMEDIATELY with plenty of water for at least 15-20 minutes. Get medical attention immediately! Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed
Corrosive effects. May cause temporary blindness and severe eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire. Do not use halogenated extinguishing agents.

Specific hazards arising from the chemical
The product itself does not burn. May decompose upon heating to produce corrosive and/or toxic fumes. Contact with metal may release flammable hydrogen gas.

Special protective equipment and precautions for firefighters
Fire fighters should enter the area only if they are protected from all contact with the material. Full protective clothing, including self-contained breathing apparatus, coat, pants, gloves, boots and bands around legs, arms, and waist, should be worn. No skin surface should be exposed.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. Use water spray to cool unopened containers.

Specific methods
Use water spray to cool unopened containers.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Wear appropriate personal protective equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained. Heavier than water. See Section 8 of the SDS for Personal Protective Equipment.
Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. Retain and dispose of contaminated wash water. For waste disposal, see Section 13 of the SDS.

Environmental precautions

Do not discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Use caution when combining with water; DO NOT add water to caustic; ALWAYS add caustic to water while stirring to minimize heat generation. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe mist or vapor. Use only with adequate ventilation. Wear appropriate personal protective equipment. Transfer and storage systems should be compatible and corrosion resistant. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed. Store in a cool, dry, well-ventilated place. Store in corrosive resistant container with a resistant inner liner. Store away from incompatible materials (See Section 10). Store at temperatures not exceeding 40°C/104°F. Compatible storage materials may include, but not be limited to, the following: nickel and nickel alloys, steel, plastics, plastic or rubber-lined steel, FRP, or Derakane vinyl ester resin. Do not allow material to freeze.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hydroxide (CAS 1310-58-3)</td>
<td>Ceiling</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium hydroxide (CAS 1310-58-3)</td>
<td>TWA</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear goggles (or safety glasses with side shields) and a face shield. Wear a full-face respirator, if needed. PPE requirements should match type and amount used as determined by the end users PPE hazard assessment.

Skin protection

Hand protection

Wear appropriate chemical resistant gloves.

Skin protection

Other

Wear appropriate chemical resistant clothing.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state

Liquid.

Form

Liquid.
Color
Clear to slightly hazy.

Odor
Odorless.

Odor threshold
Not available.

pH
14 (0.5% Solution)

Melting point/freezing point
-27.4 °F (-33 °C) (45% Solution)

Initial boiling point and boiling range
271.4 °F (133 °C) (45% Solution)

Flash point
Not available.

Evaporation rate
Not available.

Flammability (solid, gas)
Not available.

Upper/lower flammability or explosive limits
Flammability limit - lower (%)
Not available.

Flammability limit - upper (%)
Not available.

Explosive limit - lower (%)
Not available.

Explosive limit - upper (%)
Not available.

Vapor pressure
6.4 mm Hg at 77°F (25°C) (45% Solution)

Vapor density
Not available.

Relative density
For product range of concentrations: 1.283 g/cm3 to 1.572 g/cm3

Solubility(ies)
Solubility (water)
Not available.

Partition coefficient (n-octanol/water)
Not available.

Auto-ignition temperature
Not available.

Decomposition temperature
Not available.

Viscosity
Not available.

Other information
Density varies in an approximately linear relationship with strength.

Molecular formula
KOH

Molecular weight
56.1 g/mol

10. Stability and reactivity

Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
Material is stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization does not occur.

Conditions to avoid
Reacts violently with strong acids. This product may react with oxidizing agents. Do not mix with other chemicals. Corrosive to aluminum, tin, zinc, copper and most alloys in which they are present including brass and bronze. Corrosive to steels at elevated temperatures above 40°C (104°F).

Incompatible materials

Hazardous decomposition products
Contact with metals (aluminum, zinc, tin) and sodium tetrahydroborate liberates hydrogen gas.

11. Toxicological information

Information on likely routes of exposure

Inhalation
Vapors and mist may irritate throat and respiratory system and cause coughing.

Skin contact
Causes skin burns.

Eye contact
Causes eye burns.

Ingestion
Harmful if swallowed. Causes digestive tract burns.

Symptoms related to the physical, chemical and toxicological characteristics
Burning pain and severe corrosive skin damage. Permanent eye damage including blindness could result.
Information on toxicological effects

Acute toxicity
Harmful if swallowed.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
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</thead>
<tbody>
<tr>
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<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
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<tr>
<td>Oral</td>
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<tr>
<td>LD50</td>
<td>Rat</td>
<td>273 mg/kg</td>
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</table>

Skin corrosion/irritation
Causes severe skin burns and eye damage.

Serious eye damage/eye irritation
Causes severe eye burns. Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization
This product is not expected to cause respiratory sensitization.

Skin sensitization
This product is not expected to cause skin sensitization.

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

IARC Monographs. Overall Evaluation of Carcinogenicity
Not listed.

NTP Report on Carcinogens
Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

Reproductive toxicity
This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Not classified.

Aspiration hazard
Not classified, however droplets of the product may be aspirated into the lungs through ingestion or vomiting and may cause a serious chemical pneumonia.

Chronic effects
Prolonged inhalation may be harmful.

Further information
Prolonged inhalation may be harmful.

12. Ecological information

Ecotoxicity
Harmful to aquatic life.

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<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<tr>
<td>Aquatic</td>
<td></td>
<td></td>
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<tr>
<td>Fish</td>
<td>LC50</td>
<td>Western mosquitofish (Gambusia affinis) 80 mg/l, 96 Hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
No data is available on the degradability of this product.

Bioaccumulative potential
No data available for this product.

Mobility in soil
Not available.

Other adverse effects
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazardous waste code
If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261. D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

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<tr>
<td>Transport hazard class(es)</td>
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<td></td>
<td>Subsidiary risk -</td>
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<td>Label(s) 8</td>
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<td>Packing group</td>
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</table>

Special precautions for user

Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.

Special provisions

B2, IB2, T7, TP2

Packaging exceptions

154

Packaging non bulk

202

Packaging bulk

242

IATA

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<tr>
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<td></td>
<td>Subsidiary risk -</td>
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<td>Packing group II</td>
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<td>Environmental hazards</td>
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<td>ERG Code</td>
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Special precautions for user

Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.

IMDG

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<th>UN1814</th>
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<td>UN proper shipping name</td>
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<td></td>
<td>Subsidiary risk -</td>
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<tr>
<td></td>
<td>Packing group II</td>
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<td>Environmental hazards</td>
<td>Marine pollutant No.</td>
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<tr>
<td></td>
<td>EM-S F-A, S-B</td>
</tr>
</tbody>
</table>

Special precautions for user

Read safety instructions, SDS and emergency procedures before handling. Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA Hazardous Substance: Potassium Hydroxide, CAS # 1310-58-3, RQ = 1000 lbs.

TSCE Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Potassium hydroxide (CAS 1310-58-3) LISTED
Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
- Immediate Hazard - Yes
- Delayed Hazard - No
- Fire Hazard - No
- Pressure Hazard - No
- Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical
Yes

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations
- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  Not regulated.
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  Not regulated.
- Safe Drinking Water Act (SDWA)
  Not regulated.

US state regulations
- US. Massachusetts RTK - Substance List
  Potassium hydroxide (CAS 1310-58-3)
- US. New Jersey Worker and Community Right-to-Know Act
  Potassium hydroxide (CAS 1310-58-3)
- US. Pennsylvania Worker and Community Right-to-Know Law
  Potassium hydroxide (CAS 1310-58-3)
- US. Rhode Island RTK
  Potassium hydroxide (CAS 1310-58-3)
- US. California Proposition 65
  This product is not listed, but it may contain elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 Safe Drinking Water and Toxic Enforcement Act. For additional information, contact Olin Technical Services (800-299-6546).

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
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<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date: 20-December-2013
Revision date: 08-March-2016
Version #: 03
HMIS® ratings
Health: 3
Flammability: 0
Physical hazard: 0

NFPA ratings

List of abbreviations
LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective Concentration, 50%.
TWA: Time weighted average.

References
EPA: AQUIRE database
HSDB® - Hazardous Substances Data Bank
US. IARC Monographs on Occupational Exposures to Chemical Agents
IARC Monographs. Overall Evaluation of Carcinogenicity
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices

Disclaimer
This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.