

SAFETY DATA SHEET



CAUSTIC POTASH LIQUID (ALL GRADES)

SDS No.: M31866
North America EN

Rev. Date: 16-Dec-2021

SECTION 1. CHEMICAL PRODUCT / COMPANY IDENTIFICATION

Company Identification:	Occidental Chemical Corporation 14555 Dallas Parkway, Suite 400 Dallas, Texas 75254-4300
Manufacturing Address:	Occidental Chemical Corporation 266 Highway 3142 Taft, LA 70057-2608
24 Hour Emergency Telephone Number:	1-800-733-3665 (USA); CANUTEC (Canada): 1-613-996-6666; CHEMTREC (within USA and Canada): 1-800-424-9300; CHEMTREC (outside USA and Canada): +1 703-527-3887; CHEMTREC Contract No: CCN16186
To Request an SDS:	MSDS@oxy.com or 1-972-404-3245
Customer Service:	1-800-752-5151 or 1-972-404-3700
Product Identifier:	CAUSTIC POTASH LIQUID (ALL GRADES)
Trade Name:	Caustic Potash Membrane Dilute Solution 45%, 48%, 50% Caustic Potash (10-51% solutions) Caustic Potash Liquid Caustic Potash Membrane Food Grade 45 - 50%
Synonyms:	KOH; Liquid Potash; Potassium Hydroxide
Product Use:	Intermediate in industrial manufacturing processes, such as manufacture of potassium fertilizers, potassium carbonate or other potassium salts and other organic chemicals; Food processing; Alkaline batteries; detergents / soaps; Dyeing, bleaching, and mercerizing cotton; Paint and varnish removers; Electroplating, photoengraving, and lithography; Analytical chemistry and in organic synthesis; Pharmaceutic aid (alkalizer); Chemical peeling of fruits and vegetables; Absorption of CO ₂ , SO ₃ , and NO ₃ in gas streams; pH adjustment

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Uses Advised Against: This product meets ANSI/AWWA B511-10 and the test requirements specified in the Food Chemicals Codex (FCC); however, all prospective uses of this product in a food or food related application must be carefully assessed by the user against appropriate regulations. The product user should not make the assumption that products meeting FCC test requirements are satisfactory for all uses without such assessment. In addition, there may be other applicable requirements for a particular food product application that may need to be considered in this assessment, for example, such as those defined by the United States Food and Drug Administration (US FDA) for production in a facility following all cGMP (current Good Manufacturing Practices). It is the user's responsibility to ensure compliance of this product for their particular food use application

Other Global Restrictions on Use: Other restrictions on use based on local, regional, or national regulations may exist and must be determined on a case-by-case basis.

Chemical Family: Alkali Metal Hydroxide

Note: Caustic potash (potassium hydroxide or KOH) is manufactured by Occidental Chemical Corporation using membrane electrolytic cell technology.

SECTION 2. HAZARDS IDENTIFICATION

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

EMERGENCY OVERVIEW:

Color: Colorless
Physical State: Liquid
Appearance: Clear liquid
Odor: Odorless

Signal Word: **DANGER**

MAJOR HEALTH HAZARDS: CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. CAUSES SERIOUS EYE DAMAGE. HARMFUL IF SWALLOWED.

PHYSICAL HAZARDS: MAY BE CORROSIVE TO METALS. Mixing with water, acid or incompatible materials may cause splattering and release of heat. Do not store in aluminum container, use aluminum fittings, or aluminum transfer lines, as aluminum will quickly corrode and flammable hydrogen gas will be generated. Accelerated corrosion can occur in areas where equipment is subjected to extremely high temperatures. Absorb / collect spillage to prevent

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material damage.

PRECAUTIONARY STATEMENTS: Do not breathe dusts or mists. Wash skin and contaminated clothing thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves, protective clothing, eye, and face protection. Keep only in original container or container compatible with product (see Section 7 - Safe Storage Conditions). Absorb / collect spillage to prevent material damage.

ADDITIONAL HAZARD INFORMATION: Toxicity may be delayed and may not be readily visible. Significant exposures must be referred for medical attention immediately. There is no specific antidote.

HAZARD CLASSIFICATION:

GHS: PHYSICAL HAZARDS:	Category 1 - May be corrosive to metals
GHS: CONTACT HAZARD - SKIN:	Category 1A - Causes severe skin burns and eye damage
GHS: CONTACT HAZARD - EYE:	Category 1 - Causes serious eye damage
GHS: ACUTE TOXICITY - ORAL:	Category 4 - Harmful if swallowed

Unknown Acute Dermal Toxicity:

There is no acute dermal toxicity data available for this material. Potassium hydroxide is a corrosive substance at concentrations of about 2% and higher. For this reason, there is no need for further acute toxicity testing.

Unknown Acute Inhalation Toxicity:

There is no acute inhalation toxicity data available for this material. Potassium hydroxide is a corrosive substance at concentrations of about 2% and higher. For this reason, there is no need for further acute toxicity testing.

GHS SYMBOL: Corrosive, Exclamation mark



GHS SIGNAL WORD: DANGER

GHS HAZARD STATEMENTS:**GHS - Physical Hazard Statement(s)**

- May be corrosive to metals

GHS - Health Hazard Statement(s)

- Harmful if swallowed
- Causes severe skin burns and eye damage

GHS - Precautionary Statement(s) - Prevention

- Do not breathe dust, fume, gas, mist, vapors, or spray
- Wash skin and contaminated clothing thoroughly after handling
- Do not eat, drink or smoke when using this product
- Wear protective gloves/protective clothing/eye protection/face protection
- Keep only in original container

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GHS - Precautionary Statement(s) - Response

- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
- IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing

- IF EXPOSED (skin/eye): Immediately call a POISON CENTER or doctor/physician
- IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing
- IF INHALED: Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see First Aid information on product label and/or Section 4 of the SDS)
- Absorb spillage to prevent material damage

GHS - Precautionary Statement(s) - Storage

- Store in a secure manner
- Store in corrosive resistant and NON-ALUMINUM container with a resistant inner liner (NOTE: flammable hydrogen gas may be generated if aluminum container and/or aluminum fittings are used)

GHS - Precautionary Statement(s) - Disposal

- Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations

Physical Hazards of Significance Not Mentioned in GHS Classification

- Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas will be generated
- Accelerated corrosion can occur in areas where equipment is subjected to extremely high temperatures

See Section 11: TOXICOLOGICAL INFORMATION

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Percent [%]
Water	7732-18-5	49-90
Potassium hydroxide	1310-58-3	10-51

SECTION 4. FIRST AID MEASURES

General Advice: Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis, and/or perforation.

INHALATION: IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. IF INHALED: Immediately call a POISON CENTER OR PHYSICIAN.

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SKIN CONTACT: IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water/shower. SPECIFIC TREATMENT: Wash with lots of water. IF EXPOSED (skin): Immediately call a POISON CENTER or doctor/physician. Wash clothing before reuse. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

EYE CONTACT: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. SPECIFIC TREATMENT: Wash with lots of water. IF EXPOSED (eyes): Immediately call a POISON CENTER or doctor/physician.

INGESTION: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Most Important Symptoms/Effects (Acute and Delayed):

Corrosive. This material may be corrosive to any tissue it comes in contact with. It can cause serious burns and extensive tissue destruction resulting in liquefaction, necrosis, and/or perforation.

Acute Symptoms/Effects:

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeal spasm and edema, shortness of breath, bronchio-constriction, and possible pulmonary edema. Severe and permanent scarring may occur. Aspiration of this material may cause the same conditions.

Skin: Skin Corrosion: When skin is exposed to solid product with moisture, may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Eye: Serious Eye Damage. Eye exposures may cause eyelid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur. Ingestion may result in corrosive injury to the upper gastrointestinal tract. Signs and symptoms include vomiting, blood in vomit, drooling, difficulty swallowing, pain with swallowing, and abdominal pain. Hoarseness, cough, difficulty breathing are indicators of serious complications. Esophageal injury may occur in absence of oral burns. Oral burns are significant and further investigation is indicated.

Delayed Symptoms/Effects:

- Repeated or prolonged exposures to skin that cause irritation may cause a chronic dermatitis

Protection of First-Aiders: Protect yourself by avoiding contact with this material. Use personal protective equipment (PPE). Refer to Section 8 for specific PPE recommendations. Avoid contact with skin and eyes. Do not ingest. Do not breathe vapors, mist, or spray. At minimum, treating personnel should utilize PPE sufficient for prevention of bloodborne pathogen transmission.

Notes to Physician: Medical observation and assessment is recommended for all ingestions, all eye exposures, and symptomatic inhalation and dermal exposures. If medical observation is required, monitor for a minimum of 4 hours for the onset or worsening of symptoms. For symptomatic ingestion, do not administer oral fluids and consider investigation by endoscopy, X-ray, or CT scan. Esophageal perforation, airway compromise, hypotension, and shock are possible. For prolonged exposures and significant exposures, consider delayed injury to exposed tissues. If burn is present, treat as any thermal burn, after decontamination. There is no antidote. Treatment is supportive care.

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Surgical intervention may be required.

Medical Conditions Aggravated by Exposure: Corrosive. May aggravate pre-existing eye, skin, and respiratory conditions (including asthma and other breathing disorders).

SECTION 5. FIRE-FIGHTING MEASURES

Explosive properties: In water solution caustic potash can react with amphoteric metals (such as aluminum) generating hydrogen which is flammable and/or explosive when ignited.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire. Use water spray to keep containers cool. Avoid direct contact of this product with water as this can cause an exothermic reaction. Use guidelines for firefighting found in ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)].

Unsuitable Extinguishing Media: Do not use a solid water stream as it may scatter and spread fire by the heat that the fire generates in contact with the water.

Specific Hazards: Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air. Hydrolysis generates enough heat to ignite adjacent combustible material. Dissolves in water with liberation of heat, may steam and spatter. Solution is basic (alkaline).

Fire Fighting: Move container from fire area if it can be done without risk. Cool containers with water. Wear NIOSH approved positive-pressure self-contained breathing apparatus operated in pressure demand mode. Avoid contact with skin and eyes. Avoid inhalation of material or combustion by-products.

Advice for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Avoid contact with skin and eyes. Move container from fire area if it can be done without risk. Do not apply water directly to a leak. Heat is generated when mixed with water.

Hazardous Combustion Products: May react with chemically reactive metals such as aluminum, zinc, magnesium, copper, etc. to release hydrogen gas which can form explosive mixtures in air

Sensitivity to Mechanical Impact: Not sensitive.

Sensitivity to Static Discharge: Not sensitive.

Lower Flammability Level (air): Not flammable

Upper Flammability Level (air): Not flammable

Flash point: Not flammable

Auto-ignition Temperature: Not applicable

GHS: PHYSICAL HAZARDS:

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- Category 1 - May be corrosive to metals

Physical Hazards of Significance Not Mentioned in GHS Classification

- Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas will be generated
 - Accelerated corrosion can occur in areas where equipment is subjected to extremely high temperatures
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SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Avoid contact with skin, eyes and clothing. Do not breathe dust, fume, gas, mist, vapors, or spray. Wear appropriate personal protective equipment recommended in Section 8, Exposure Controls / Personal Protection, of the SDS. Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures. Take any precaution to avoid mixing with combustibles or incompatible materials. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment: Wear protective gloves, protective clothing, eye, and face protection.

Emergency Procedures: All transfer facilities should have a documented spill prevention and containment program for all hazardous materials. Consideration must be given to the containment of caustic spills and leaks to comply with applicable federal, state, and local regulations.

Environmental Precautions: Keep out of water supplies and sewers. This material is alkaline and may raise the pH of surface waters with low buffering capacity. Releases should be reported, if required, to appropriate agencies.

Methods and Materials for Containment, Confinement, and/or Abatement: .:

Methods and Materials for Clean-up

Recovery: In case of spill or leak, stop the leak as soon as possible. Small and large spills: Contain spilled material if possible. After containment, collect the spilled material and transfer to a chemical waste area. Liquid material may be removed with a properly rated vacuum truck. The recovered product must be transferred to an appropriate and compatible container (stainless steel, PVC, Fiberglass or similar). Seal and label container.

Neutralization: Neutralize residue with dilute acid and follow with a liberal covering of sodium bicarbonate or other acceptable drying agent. See Section 13, Disposal considerations, for additional information.

Final Disposal: Shovel dry material into suitable container. Recycle or dispose according to regulations.

Additional Disaster Prevention Measures: Use caution when selecting spill absorbents. Liquids with this reactive group classification have been known to react with the absorbents such as cellulose-based absorbents and mineral-based and clay-based absorbents.

SECTION 7. HANDLING AND STORAGE

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Handling:

Precautions for Safe Handling: Keep equipment clean by immediately washing off any spill or accumulation of caustic potash. Extreme care must be exercised when adding dry caustic potash to water or to a solution. Its high heat of solution generates large amounts of heat which can cause local boiling or spurting. When making solutions always add the caustic potash slowly to the water surface with constant stirring. Never add the water to the caustic potash.

Technical measures/precautions: Caustic potash is corrosive and should be handled in either steel, nickel, nickel alloys or certain types of plastic equipment. The specific handling material will depend on the conditions under which the material is being used. Consideration must be given to handling temperatures, solution concentration, need to control iron contamination / corrosion, and equipment location along with safety / environmental risk potential.

Other precautions: The addition of caustic potash to liquid will cause a rise in temperature. If caustic potash becomes concentrated in one area, or is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists or boiling or spattering which may cause immediate VIOLENT ERUPTION.

Prevention of contact: Do not breathe dust or spray mist. Wash skin and contaminated clothing thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves, protective clothing, eye, and face protection.

Storage:

Safe Storage Conditions: Caustic potash is a corrosive chemical, which is normally handled in either steel, nickel, nickel alloys or certain types of plastic equipment. The specific material will depend on the conditions under which the material is being used. Do not store in aluminum container, or use aluminum fittings or transfer lines, as flammable hydrogen gas may be generated. Store and handle in accordance with all current regulations and standards. Keep container tightly closed and properly labeled. Store in a cool, dry, well ventilated area. Keep separated from incompatible substances (see below or Section 10 of the Safety Data Sheet).

Technical measures: When using plastic storage containers such as polyethylene, polypropylene, PVC or CPVC ensure their maximum temperature limitation is not exceeded. In addition, ensure glue joints do not contain silica fillers, which can easily be attacked by caustic potash. Consult with the manufacturer of all storage and processing equipment to determine the exact limitations of the specific plastic being considered.

Incompatible Substances:

- Flammable liquids
- Water
- Acids, halogenated compounds, and prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys

Packaging or Materials of Construction: The location, capacity, design, maintenance and operation of caustic storage installations may be subject to local, state or provincial regulations and to insurance company requirements. Installations shall fully comply with all applicable requirements.

Additional Information:

Do not store in aluminum container, use aluminum fittings, or aluminum transfer lines, as aluminum will quickly corrode and flammable hydrogen gas will be generated. Aluminum, copper, zinc, lead and their alloys (brass and bronze) are NOT suitable for handling or storing caustic potash. Caustic potash readily attacks these materials.

GHS: PHYSICAL HAZARDS:

- Category 1 - May be corrosive to metals

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Physical Hazards of Significance Not Mentioned in GHS Classification

- Do not store in aluminum container or use aluminum fittings or transfer lines, as flammable hydrogen gas will be generated
- Accelerated corrosion can occur in areas where equipment is subjected to extremely high temperatures

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**REGULATORY EXPOSURE LIMIT(S):**

No United States Regulatory Exposure Levels; however, see Canadian Regulatory Exposure Level(s).

Component	Canada - TWAs	Canada - STELs	Canada - Ceilings
Potassium hydroxide 1310-58-3	-----	-----	Ontario - 2 mg/m ³ (Ceiling)

NON-REGULATORY EXPOSURE LIMIT(S):

Listed below for the product components that have non-regulatory occupational exposure limits (OELs).

Component	ACGIH TWA	ACGIH STEL	ACGIH Ceiling	Skin Absorption - ACGIH	OSHA TWA (Vacated)	OSHA STEL (Vacated)	OSHA Ceiling (Vacated)
Potassium hydroxide 1310-58-3	-----	-----	2 mg/m ³	-----	-----	-----	2 mg/m ³

- The Non-Regulatory United States Occupational Safety and Health Administration (OSHA) limits, if shown, are the Vacated 1989 PEL's (vacated by 58 FR 35338, June 30, 1993). OSHA Ceiling values indicate the exposure limit, which at no time shall be exceed. Instantaneous monitoring is the preferred method to determine compliance with OSHA Ceiling values. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure which shall not be exceeded at any time during the working day [29CFR1910.1000(a)(1)]

ACGIH TLV Ceiling (C) limits are airborne concentrations that should not be exceeded in the workplace under any circumstances. Ceiling limits can supplement other limits or stand alone.

ENGINEERING CONTROLS: Use closed systems when possible. Provide local exhaust ventilation where dust or mist may be generated. Ensure compliance with applicable exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection: Wear chemical safety goggles with a face shield to protect against eye and skin contact when appropriate. Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Wear protective clothing to minimize skin contact. When potential for contact with wet material exists, wear Tychem® or similar chemical protective suit. When potential for contact with dry material exists, wear disposable coveralls suitable for dust exposure, such as Tyvek®. Always place pants legs over boots. Thoroughly clean and dry contaminated clothing before reuse. Discard contaminated leather goods.

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Hand Protection: Wear appropriate chemical resistant gloves. If contact with forearms is likely, wear gauntlet style gloves. Consult a glove supplier for assistance in selecting an appropriate chemical resistant glove.

Protective Material Types: Butyl rubber, Natural rubber, Nitrile, Polyvinyl chloride (PVC), Tychem®, Tyvek®

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate, use a NIOSH approved full-facepiece respirator with an N100, R100, or P100 filter. For an emergency or planned entry into unknown concentrations or IDLH conditions, use any self-contained breathing apparatus (SCBA) that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode OR any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus (e.g. airline with auxiliary escape pack). A respiratory protection program that meets 29 CFR 1910.134 must be followed whenever workplace conditions warrant use of a respirator.

Other Protective Equipment: Provide an emergency eyewash fountain and quick drench shower in the immediate work area.

HYGIENE MEASURES: Do not breathe dust or spray mist. Do not get in eyes, on skin, or on clothing. Wear protective gloves, protective clothing, eye, and face protection. For environmental protection remove and wash all contaminated protective equipment before re-use. Use outdoors or in a well-ventilated area. Keep separated from incompatible substances.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Clear liquid
Color:	Colorless
Odor:	Odorless
Molecular Weight:	56.11
Molecular Formula:	KOH
Chemical Family:	Alkali Metal Hydroxide
pH:	13 - 14
Freezing Point/Range:	-85 to 39 °F (-65 to 4 °C)
Boiling point / boiling range	216 a 289 °F (102 a 143 °C)
Flash point:	Not flammable
Vapor Pressure:	4 mmHg @ 77°F (25°C) 50% solution 20 mmHg @ 77°F (25°C) 20% solution
Vapor Density (air=1):	No data available
Relative Density/Specific Gravity (water=1):	1.09 - 1.52 @ 15.6 °C
Density:	9.09 - 12.67 lbs/gal (1.09 - 1.52 kg/L) @ 15.6 °C
Water Solubility:	100%
Partition Coefficient (n-octanol/water):	Not applicable
Auto-ignition Temperature:	Not applicable
Odor Threshold [ppm]:	Not applicable

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Evaporation Rate (ether=1):	No data available
VOC Content (%):	0%
Volatility:	No data available
Flammability (solid, gas):	Not flammable
Lower Flammability Level (air):	Not flammable
Upper Flammability Level (air):	Not flammable
Viscosity:	See Caustic Potash Technical Handbook page 36 (Graph 7: Viscosity of Aqueous KOH Solutions)
Radioactivity:	90% KOH of 40K = 19,430 Bq /Kg (calculated)

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability: Stable at normal temperatures and pressures.

Reactivity: Soluble in water, releasing heat sufficient to ignite combustibles. Reacts with acids, giving off heat.

Possibility of Hazardous Reactions: Mixing with water, acid, or incompatible materials may cause splattering and release of large amounts of heat. When moist, reacts with some metals forming flammable hydrogen gas. Carbon monoxide gas may form upon contact with reducing sugars, food and beverage products in enclosed spaces. Potassium hydroxide (KOH) can form a potentially explosive reaction with bromoform + crown ethers, chlorine dioxide, nitrobenzene, nitromethane, nitrogen trichloride, peroxidized tetrahydrofuran, 2,4,6-trinitrotoluene. Reaction with ammonium hexachloroplatinate(2-) + heat forms a heat-sensitive explosive product. Violent reaction or ignition under the appropriate conditions with acids, alcohols, p-bis(1,3-dibromoethyl)benzene, cyclopentadiene, germanium, hyponitrous acid, maleic anhydride, nitroalkanes, 2-nitrophenol, potassium peroxodisulfate, sugars, 2,2,3,3-tetrafluoropropanol, thorium dicarbide, and molten ortho nitrophenol. 1,2-Dichloroethylene and potassium hydroxide reaction/ produces chloroacetylene, which is spontaneously flammable in air.

Conditions to Avoid (e.g., static discharge, shock, or vibration): No information available.

Incompatible Substances: Flammable liquids. Water. Acids, halogenated compounds, and prolonged contact with aluminum, brass, bronze, copper, lead, tin, zinc or other alkali sensitive metals or alloys.

Hazardous Decomposition Products: Thermal decomposition can lead to release of toxic/corrosive fumes of potassium oxide.

Hazardous Polymerization: Will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS:**ACUTE TOXICITY:**

When in solution, this material will affect all tissues with which it comes in contact. The severity of the tissue damage

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is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure, there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact.

Eye contact: Potassium hydroxide is a corrosive substance at concentrations of about 2% and higher. Causes serious eye damage, which can result in severe irritation, pain and burns, and permanent damage including blindness.

Skin contact: Potassium hydroxide is a corrosive substance at concentrations of about 2% and higher. Causes severe skin burns.

Inhalation: May cause severe irritation of the respiratory tract with coughing, choking, pain and possibly burns of the mucous membranes. This material can be extremely destructive to the tissue of the mucus membranes and respiratory system.

Ingestion: Ingestion of alkali such as potassium hydroxide (KOH) causes liquefactive necrosis, which results in gastrointestinal burns. The severity of damage depends on concentration of KOH, but also on the quantity swallowed. Aspiration into the airway can result in life-threatening injuries to the larynx, the tracheobronchial passages, and the lungs.

CHRONIC TOXICITY:

Repeated and prolonged skin contact may result in dermatitis.

SIGNS AND SYMPTOMS OF EXPOSURE:

Inhalation (Breathing): Respiratory System Effects: Exposure to airborne material may cause irritation, redness of upper and lower airways, coughing, laryngeal spasm and edema, shortness of breath, bronchio-constriction, and possible pulmonary edema. Severe and permanent scarring may occur. Aspiration of this material may cause the same conditions.

Skin: Skin Corrosion: When skin is exposed to solid product with moisture, may cause redness, itching, irritation, swelling, burns (first, second, or third degree), liquefaction of skin, and damage to underlying tissues (deep and painful wounds).

Eye: Serious Eye Damage. Eye exposures may cause eyelid burns, conjunctivitis, corneal edema, corneal burn, corneal perforation, damage to internal contents of the eye, permanent visual defects, and blindness and/or loss of the eye.

Ingestion (Swallowing): Gastrointestinal System Effects: Exposure by ingestion may cause irritation, swelling, and perforation of upper and lower gastrointestinal tissues. Permanent scarring may occur. Ingestion may result in corrosive injury to the upper gastrointestinal tract. Signs and symptoms include vomiting, blood in vomit, drooling, difficulty swallowing, pain with swallowing, and abdominal pain. Hoarseness, cough, difficulty breathing are indicators of serious complications. Esophageal injury may occur in absence of oral burns. Oral burns are significant and further investigation is indicated.

GHS HEALTH HAZARDS:

GHS: CONTACT HAZARD - SKIN: Category 1A - Causes severe skin burns and eye damage

GHS: CONTACT HAZARD - EYE: Category 1 - Causes serious eye damage

GHS: ACUTE TOXICITY - ORAL: Category 4 - Harmful if swallowed

TOXICITY DATA:

PRODUCT TOXICITY DATA: Data is from studies conducted internally

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LD50 Oral: 365 mg/kg oral-rat LD50	LD50 Dermal: No data available	LC50 Inhalation: No data available
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COMPONENT TOXICITY DATA: The component toxicity data is populated by the LOLI database and may differ from the product toxicity data given

Component	Oral LD50	Dermal LD50	Inhalation LC50
Potassium hydroxide	284 mg/kg (Rat)	No data available	

Skin/Eye Irritation/Corrosion: Potassium hydroxide in dry forms and in liquid forms at concentrations $\geq 2\%$ are corrosive to skin, eyes, and mucosa tissues.

Skin Absorbent / Dermal Route: NO

Direct skin contact can cause severe burns if not quickly rinsed away with copious amounts of water, there is no indication that skin contact with potassium hydroxide can elicit systemic poisoning.

RESPIRATORY OR SKIN SENSITIZATION: Existing negative animal skin sensitization data and lack of reported human cases supports not classifying potassium hydroxide as either a skin or respiratory sensitizer.

CARCINOGENICITY: Systemic carcinogenicity is not expected to occur because potassium hydroxide is not expected to be systemically available in the body under normal handling and use conditions. In addition, there are no valid carcinogenicity studies available to assess the risk on local carcinogenic effects.

SPECIFIC TARGET ORGAN TOXICITY (Single Exposure): While there are no available inhalation studies due to animal welfare concerns; human experience with this substance is that it acts as a strong alkali in both dust and mist forms. Not only does it act as a corrosive to skin, eyes, and mucosa; inhalation exposure to dust or mists may cause irritation of the upper respiratory tract and tissue damage and pulmonary edema may develop.

SPECIFIC TARGET ORGAN TOXICITY (Repeated or Prolonged Exposure): While there are no available inhalation studies due to animal welfare concerns and while experience with this substance is mainly inflammation of upper respiratory tract, chronic exposures have been reported in the literature to cause ulcers in the nasal septum. However, there are no reports on investigation and research regarding what levels of airborne concentrations and the duration of exposure occurrence causes these nasal septum ulcers.

INHALATION HAZARD: There are no acute inhalation toxicity data available for this material. Potassium hydroxide is a corrosive substance at concentrations of about 2% and higher. For this reason, there is no need for further acute toxicity testing. In addition, all human exposure cases were the result of unintentional ingestion or suicide attempts not applicable to the occupational setting; therefore, GHS classification for acute inhalation toxicity is not possible.

GERM CELL/IN-VITRO MUTAGENICITY: Potassium hydroxide did not induce mutagenicity in in-vitro and in-vivo studies.

REPRODUCTIVE TOXICITY: Potassium hydroxide is not expected to be systemically available in the body under normal handling and use conditions and for this reason it can be stated that the substance will not reach the fetus nor male and female reproductive organs. Therefore, it can be concluded that a specific study to determine the developmental or reproduction toxicity of potassium hydroxide is not necessary.

ASPIRATION HAZARD: Not applicable for solid forms of potassium hydroxide. There are human case reports in the literature of unintentional ingestion of liquid KOH describing aspiration hazards of the alkali into the airways causing fatal damage to the larynx, trachea, bronchus, and lungs.

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TOXICOKINETICS: As potassium hydroxide is dissociated in the body fluids, its systemic toxicity must be discussed for its constituting potassium (K⁺) and hydroxyl ions (OH⁻) separately. Regulation of K⁺ concentration in blood is assured principally by renal excretion and reabsorption. Uptake of the OH⁻ ion is not expected to change the pH in the blood under normal handling and use conditions.

METABOLISM: Not available.

BIOLOGICAL DISTRIBUTION: See Toxicokinetics above.

PATHOGENICITY AND ACUTE INFECTIOUSNESS (ORAL, DERMAL, AND INHALATION): Studies suggest that exposure may increase the prevalence of wheezing and rhinitis; however, no measurable changes in lung function were identified.

ENDOCRINE DISRUPTOR: This product does not contain any known or suspected endocrine disruptors.

NEUROTOXICITY: Potassium is an essential constituent of the body fluids. It is the principal intracellular cation (approximately 5.7 g/l) and it is necessary for the nervous and muscular cells function, as well as for several metabolic activities, among others the synthesis of proteins. Severe toxic doses of over 310 mg/l may lead to neuromuscular paralysis; however, these toxic dosages would be a direct result from intentional ingestion not expected in the occupational setting.

IMMUNOTOXICITY: No relevant information available.

SECTION 12. ECOLOGICAL INFORMATION

ECOTOXICITY (EC, IC, and LC):

Aquatic Toxicity:

Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K⁺ and OH⁻. Therefore, the only possible effect would result from the pH effect. There are no available chronic aquatic data for KOH. The acute effects are mostly linked to pH; it is not expected to have long-term effect on the environment.

Fish Toxicity:

LC50 (Gambusia affinis): 80 mg/L 96h static

Algae Toxicity:

ErC50 Green algae: 61 mg/kg (96 hour)

Invertebrate Toxicity:

EC50 (Daphnia magna): 60 mg/L/48 hour (static bioassay at 20.3-20.7 °C)

FATE AND TRANSPORT:

PERSISTENCE: This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

BIODEGRADATION: This material is inorganic and not subject to biodegradation.

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BIOCONCENTRATION: This material is not expected to bioconcentrate in organisms.

BIOACCUMULATIVE POTENTIAL: Potassium hydroxide is a strong alkaline substance that dissociates completely in water to K⁺ and OH⁻. Considering its high water solubility, potassium hydroxide is not expected to bioconcentrate in organisms. Log Pow is not applicable for an inorganic compound that dissociates.

MOBILITY IN SOIL: Potassium hydroxide is not expected to be absorbed in soil due to its dissociation properties and high water solubility.

ADDITIONAL ECOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms. The risk that potassium hydroxide poses for the environment is essentially restricted to pH increase.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from material:

Reuse or reprocess, if possible. Keep out of water supplies and sewers. May be subject to disposal regulations. Dispose in accordance with all applicable regulations.

Container Management:

Dispose of container in accordance with applicable local, regional, national, and/or international regulations. Container rinsate must be disposed of in compliance with applicable regulations.

Contaminated Material:

Contaminated packaging should be disposed of as unused product.

SECTION 14. TRANSPORT INFORMATION

LAND TRANSPORT

U.S. DOT 49 CFR 172.101:

UN NUMBER: UN1814
PROPER SHIPPING NAME: Potassium hydroxide, solution
HAZARD CLASS/ DIVISION: 8
PACKING GROUP: II
LABELING REQUIREMENTS: 8
RQ (Lbs.): RQ 1,000 Lbs. (Potassium hydroxide)

Special provisions for transport: Not applicable.

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

UN NUMBER: UN1814
SHIPPING NAME: Potassium hydroxide, solution

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CLASS OR DIVISION: 8
PACKING/RISK GROUP: II
LABELING REQUIREMENTS: 8

MARITIME TRANSPORT (IMO / IMDG)

UN NUMBER: 1814
PROPER SHIPPING NAME: Potassium hydroxide, solution
HAZARD CLASS / DIVISION: 8
Packing Group: II
LABELING REQUIREMENTS: 8

AIR TRANSPORT (ICAO / IATA)

UN Number: 1814
Proper shipping name: Potassium hydroxide, solution
Hazard Class: 8
Packing group: II
Special Instructions CAO: IATA Certificate for shipping personnel is required

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code The substance poses risks from the point of view of safety (S) and contamination (P). Classified as "Y", presents a danger to marine resources or human health.

SECTION 15. REGULATORY INFORMATION**U.S. REGULATIONS****OSHA REGULATORY STATUS:**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

If a release is reportable under CERCLA section 103, notify the state emergency response commission and local emergency planning committee. In addition, notify the National Response Center at (800) 424-8802 or (202) 426-2675.

Component	U.S. DOT Hazardous Substances/ RQs	CERCLA Hazardous Substances / RQs	CERCLA Section 302 EHS EPCRA RQs	Section 302 Threshold Planning Quantity (TPQ)
Potassium hydroxide 1310-58-3 (10 - 51)	1000 lbs(RQ)	1000 lb	Not listed	Not Listed

SARA EHS Chemical (40 CFR 355.30)

Not regulated.

EPCRA SECTIONS 311/312 HAZARD CATEGORIES (40 CFR 370.10):

Acute Health Hazard

SARA HAZARD CATEGORIES ALIGNED WITH GHS (2018):

Physical Hazard - Corrosive to Metal
Health Hazard - Acute Toxin (any route of exposure)
Health Hazard - Skin Corrosion or Irritation

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Health Hazard - Serious eye damage or eye irritation

EPCRA SECTION 313 (40 CFR 372.65):

Not regulated.

DEPARTMENT OF HOMELAND SECURITY (DHS)- Chemical Facility Anti-Terrorism Standards (6 CFR 27):

No components in this material are regulated under DHS

OSHA PROCESS SAFETY (PSM) (29 CFR 1910.119):

Not regulated.

FDA: This material has Generally Recognized as Safe (GRAS) status under specific FDA regulations. Additional information is available from the Code of Federal Regulations which is accessible on the FDA's website

Only the Food Grade product is guaranteed to be produced under all current Good Manufacturing Practices (cGMP) requirements as defined by the Food and Drug Administration (FDA)

Food grade product is produced in a facility that is accredited as a Safe Quality Food (SQF) Facility, certified under the Global Food Safety Initiative (GFSI), and meets the Food Chemical Codex (FCC) requirements

EPA'S CLEAN WATER AND CLEAN AIR ACTS:

Component(s) not listed on impacted regulatory lists.

OTHER REGULATIONS OF NOTE:

The U.S. Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA), and Transport Canada (TC) have requirements applicable to handling hazardous materials and the emergency response to clean up spills and releases. In particular, OSHA has regulations contained in 29 CFR 1910.120 covering areas including cleanup operations, use of personal protective equipment and emergency response training. Shippers, carriers and marine terminal operators should familiarize themselves with these specific requirements and other OSHA/WHMIS emergency response requirements

NATIONAL INVENTORY STATUS**U.S. INVENTORY STATUS: Toxic Substance Control Act (TSCA):**

Component	TSCA Inventory	TSCA ACTIVE LIST	TSCA 12(b)	TSCA/Section 4	TSCA/Section 5	TSCA/Section 6	TSCA/Section 8
Potassium hydroxide 1310-58-3 (10 - 51 %)	Listed	ACTIVE	Not Listed	Not listed	Not Listed	Not listed	Not listed

Canadian Chemical Inventory: All components of this product are listed on either the DSL or the NDSL.

Component	DSL	NDSL
Potassium hydroxide 1310-58-3 (10 - 51)	Listed	Not Listed

STATE REGULATIONS**California Proposition 65:**

This product is not listed on the California Governor's current list of Carcinogens, Reproductive Toxicants, and/or Candidate Carcinogens (Proposition 65), but it may contain trace amounts of impurities that are listed. For additional information, contact Occidental Chemical Corporation Customer Service (1-800-752-5151 or 1-972-404-3700).

Component	California	California	California	Massachusetts Right	Rhode Island Right

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	Proposition 65 Cancer WARNING:	Proposition 65 CRT List - Male reproductive toxin:	Proposition 65 CRT List - Female reproductive toxin:	to Know Hazardous Substance List	to Know Hazardous Substance List
Potassium hydroxide 1310-58-3 (10 - 51 %)	Not Listed	Not Listed	Not Listed	Listed	Listed

Component	New Jersey Right to Know Hazardous Substance List	New Jersey Special Health Hazards Substance List	New Jersey - Environmental Hazardous Substance List	Pennsylvania Right to Know Hazardous Substance List	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Special Hazardous Substances	Pennsylvania Right to Know Environmental Hazard List
Potassium hydroxide	1571	Listed-corrosive	Not Listed	Listed	Not Listed	Not Listed	Present

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Workplace Hazardous Materials Information System (WHMIS 2015) which includes the amended Hazardous Products Act (HPA) and the Hazardous Product Regulations (HPR).

Component	Canada - CEPA - Schedule I - List of Toxic Substances	Canada - NPRI	Canada - CEPA - 2010 Greenhouse Gases (GHG) Subject to Mandatory Reporting	Canadian Chemical Inventory:	NDSL
Potassium hydroxide 1310-58-3 (10 - 51)	Not listed	Not Listed	Not Listed	Listed	Not Listed

SECTION 16. OTHER INFORMATION

Prepared by: OxyChem Corporate HESS - Product Stewardship

Rev. Date: 16-Dec-2021

Reason for Revision:

- Modified Fire Fighting Measure Recommendations: SEE SECTION 5
- Revised Handling and Storage Recommendations: SEE SECTION 7
- Updated Physical and Chemical Properties. SEE SECTION 9
- TOXICOLOGICAL INFORMATION (SECTION 11)
- Updated Transportation Information: SEE SECTION 14
- Added air transport certificate requirements for shipping personnel: SEE SECTION 14
- Added NFPA 704 Symbol: SEE SECTION 16

IMPORTANT:

The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESSED OR IMPLIED, IS MADE REGARDING PERFORMANCE, SAFETY, SUITABILITY, STABILITY OR OTHERWISE. This information is not intended to be all-inclusive as to the manner and conditions of use, handling, storage, disposal and other factors that may involve other or additional legal, environmental, safety or performance considerations, and Occidental

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Chemical Corporation assumes no liability whatsoever for the use of or reliance upon this information. While our technical personnel will be happy to respond to questions, safe handling and use of the product remains the responsibility of the customer. No suggestions for use are intended as, and nothing herein shall be construed as, a recommendation to infringe any existing patents or to violate any federal, state, local or foreign laws.

OSHA Standard 29 CFR 1910.1200 requires that information be provided to employees regarding the hazards of chemicals by means of a hazard communication program including labeling, safety data sheets, training and access to written records. We request that you, and it is your legal duty to, make all information in this Safety Data Sheet available to your employees.

End of Safety Data Sheet