

POTASSIUM HYDROXIDE**PRODUCT IDENTIFICATION****Chemical Name and Synonyms:**

Potassium hydroxide; Potassium hydrate; Caustic potash;
Lye

Chemical Family:

Inorganic potassium compound/alkali hydroxide

Chemical Formula:

KOH

Product Use:

Laboratory reagent

Manufacturer's Name and Address:

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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
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Potassium hydroxide	>85	2 mg/m ³	1310-58-3
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PHYSICAL DATA**Physical State:**

Solid

Odour and Appearance:

Odourless, white to slightly yellow, deliquescent lumps, pellets,
flakes or rhombohedral crystals

Odour Threshold (ppm):

Odourless

Vapour Pressure (mm Hg):

1 mm Hg @ 719°C

Vapour Density (Air = 1):

Not applicable

Evaporation Rate:

Not applicable

Boiling Point (degrees C):

1320°C

Melting Point (degrees C):

360°C (varies with water content, anhydrous, 380°C)

pH:

13.5 (0.1 M solution)

Specific Gravity:

2.044 @ 15°C

Coefficient of Water/Oil distribution:

Log P (oct) = 0.65; 0.83

SHIPPING DESCRIPTION**UN:**

1813

T.D.G. Class:

8

Pkg. Group:

II

REACTIVITY DATA**Chemical Stability:**

Normally stable. Reacts with water, generating heat.
Rapidly absorbs carbon dioxide from air, forming potassium
carbonate.

Incompatibility with other substances:

Reacts vigorously, violently or explosively with many organic

and inorganic compounds. Acids: violent reaction can occur,
yielding heat and pressure which can burst an enclosed
container. Water: reaction may generate enough heat to ignite
combustible materials; reaction splatters corrosive potassium
hydroxide solution. Metals: reaction may produce flammable
and explosive hydrogen gas. Organohalogen compounds:
may react to form spontaneously combustible compounds.
Maleic anhydride and nitro and chloro organic compounds may
react explosively. Violently polymerizes acetaldehyde, acrolein,
acrylonitrile. Reacts with phosphorus to produce spontaneously
flammable phosphine gas. Corrosive to aluminum, lead, tin,
zinc, copper, brass, bronze, steel at elevated temperatures.
Not corrosive to nickel.

Reactivity:

Avoid elevated temperatures, contact with water, moisture, or
air. Avoid all incompatible and combustible materials,
generation of dust or mist.

Hazardous Decomposition Products:

Potassium oxide, potassium carbonate.

FIRE AND EXPLOSION DATA**Flammability:**

Not combustible, but reacts with many common substances,
including water, generating enough heat to ignite nearby
combustible materials. Releases flammable/explosive gas on
contact with metals or some other chemicals.

Extinguishing Media:

Use extinguisher suitable for surrounding fire. Use carbon
dioxide with care as it reacts with potassium hydroxide to
generate heat. Use flooding amounts of water as spray or fog
to cool containers; do not allow to come in contact with the
chemical itself. At high temperatures, fuming may occur,
giving off strong corrosive gas. Fight fire from upwind, from a
safe distance. Firefighters must wear protective equipment
(NIOSH/OSHA approved self-contained breathing apparatus)
and clothing (chemical splash suit) sufficient to prevent
inhalation of mists or vapours, contact with skin and eyes.

Flash Point (Method Used):

Non flammable

Autoignition Temperature:

Not applicable

Upper Flammable Limit (% by volume):

Not applicable

Lower Flammable Limit (% by volume):

Not applicable

Hazardous Combustion Products:

Potassium oxide, hydrogen gas

Sensitivity to Impact:

None identified

Sensitivity to Static discharge:

None identified

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:****LD₅₀:**

(oral, rat): 365 mg/kg; (oral, male rat) 273 mg/kg

LC₅₀:

Not available

Effects of Acute Exposure to Product:

Potassium hydroxide is toxic and corrosive to all tissue.

Inhaled:

Corrosive. Does not readily form vapour and is deliquescent so

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is not likely to form dust. Aerosols (may be formed when water is poured on solid) may cause severe irritation to nose, throat, and upper respiratory tract, with coughing, choking, pain in the nose, mouth and throat, lesions of the nasal septum and burns of the mucous membranes. Severe overexposure can cause pulmonary edema which may be fatal. Symptoms (shortness of breath, cyanosis, weak, rapid pulse, frothy sputum, hypotension, hemoconcentration, and moist rales) may appear several hours after exposure.

In contact with skin:

Solutions are extremely corrosive. May cause severe skin burns, with deep ulceration and permanent scarring. Will absorb moisture from skin (perspiration), air, and water being used for removal, and will form concentrated solutions which cause severe burns. Severity of injury depends on the concentration and duration of exposure. Even weak solutions may cause severe skin damage. Corroded areas are soft, gelatinous and necrotic, tissue destruction may be deep. May not be painful immediately; onset of pain may be delayed for several hours.

In contact with eyes:

Corrosive. Contact with solid or solutions may cause pain and burns, possibly severe. Severity of injury depends on the concentration and duration of exposure. Even weak solutions may cause severe damage. Solid will absorb moisture from eye or from water being used for removal and form highly concentrated corrosive solution. May cause edema, destruction of epithelium corneal opacification, iritis. Full extent of the injury may not be immediately apparent. May cause scarring of the cornea, and permanent blindness.

Ingested:

Ingestion is not a normal route of exposure for humans. Where ingestion of strong alkalis has occurred in humans, symptoms included severe pain, vomiting, diarrhea, and collapse. If death does not occur in the first 24 hours, the patient may improve for 2-4 days and then have a sudden onset of severe abdominal pain, and rapid fall of blood pressure, indicating delayed gastric or esophageal perforation. Damage to the esophagus and stomach after ingestion may progress for 2-3 weeks. Death from peritonitis may occur as late as 1 month after ingestion. Even though the patient recovers from the immediate damage, esophageal stricture may occur weeks, months or even years later to make swallowing difficult.

Effects of Chronic Exposure to Product:

Repeated or prolonged inhalation may cause ulcerative changes in the mouth and nasal passages, bronchial and gastrointestinal disturbances. Repeated or prolonged skin contact may cause dermatitis. Frequent applications of aqueous solutions (3-6%) of potassium hydroxide to skin of mice for 46 weeks produced tumors identical to those from coal tar; first warts, then skin tumors developed.

Carcinogenicity:

Implicated as a cause of cancer of the esophagus in humans who have ingested it. These cancers are due to tissue destruction rather than the chemical itself.

Teratogenicity:

No information available

Reproductive Effects:

No information available

Mutagenicity:

No in vivo information available. In vitro information suggests probably not mutagenic.

Synergistic Products:

None known

PREVENTIVE MEASURES

Engineering Controls:

Local corrosion-proof exhaust ventilation required.

Respiratory Protection:

Up to 10 mg/m³, NIOSH/OSHA approved supplied-air respirator operated in continuous-flow mode, or full face-piece respirator with high-efficiency particulate filters, or powered air-purifying respirator with dust and mist filter, or full face-piece self-contained breathing apparatus, or full face-piece supplied-air respirator. Higher or unknown concentrations, full face-piece respirator with high-efficiency particulate filters or escape-type self-contained breathing apparatus.

Eye Protection:

Chemical safety goggles, full face shield.

Skin Protection:

Butyl, nitrile or natural rubber, neoprene, PVC or Viton™ gloves. Other impervious clothing, apron, sleeves, coverall, boots, sufficient to prevent contact.

Other Personal Protective Equipment:

Emergency shower and eye wash in working order and within easy access.

Leak and Spill Procedure:

Evacuate and ventilate area. Eliminate ignition sources; remove combustible materials from area. Cleanup personnel must be thoroughly trained in the hazards of this chemical and must wear protective equipment and clothing sufficient to prevent inhalation of mists or vapours, and contact with skin and eyes. DO NOT TOUCH SPILLED MATERIAL. Gather up dry chemical for recycling or disposal. Neutralize final traces and flush area with water. Contain solutions with inert material. Prevent from entering sewers and waterways. Carefully dilute with water and neutralize with dilute acid (may generate heat and fumes, wear respiratory equipment to avoid exposure). Collect in appropriate containers for disposal. Flush the spill area with copious amounts of water.

Waste Disposal:

Follow all federal, provincial, and local regulations.

Handling Procedures and Equipment:

EXTREMELY CORROSIVE, TOXIC. Before working with this product, ensure that engineering controls are operating. Personnel working with this product must be thoroughly trained in its hazards and its safe use and must wear appropriate protective equipment and clothing. Avoid all contact and inhalation. Use the smallest amount possible for the purpose in a designated area with adequate ventilation. Keep workplace free of extraneous and incompatible materials. Use corrosion-resistant tools and equipment. When diluting, always add solid to liquid, sprinkling solid slowly over surface of lukewarm water, stirring constantly. Treat empty containers with caution as they will contain hazardous residues.

Storage Requirements:

Store in suitable, labelled containers, in a cool, dry, well-ventilated area, away from all incompatible materials. Keep container tightly closed. Storage facilities should be made of corrosion-resistant materials, and should have raised sill or ramps. Protect from damage, and inspect frequently for signs of leaking. Containers may develop pressure during storage; if venting is necessary it must be performed by trained personnel. Do not vent swollen drums; contact manufacturer for directions. Do not expose sealed containers to elevated temperatures.

FIRST AID MEASURES

Specific Measures:

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Eyes:

Quickly blot or brush away excess chemical. **IMMEDIATELY** flush eyes with copious amounts of gently running water, holding eyelids open, at least sixty (60) minutes. Wear impervious gloves to avoid contact during first aid procedures. Take care not to rinse contaminated water into the unaffected eye. Continue irrigating with weater or normal saline until the pH has returned to normal (30-60 minutes). Do not interrupt flushing to transport victim to hospital. Cover with sterile bandages. Get medical attention **IMMEDIATELY**.

Skin:

Remove contaminated clothing (including shoes, watches, belts, rings). Wear protective gloves to avoid contact. **IMMEDIATELY** flush the exposed area with large amounts of running water for at least sixty (60) minutes. Do not interrupt flushing. Get **MEDICAL ATTENTION IMMEDIATELY** even if there is no pain. Discard contaminated clothing, shoes, etc.

Inhalation:

Immediately remove to fresh air (rescuers must use caution to avoid exposure to contaminating fumes). Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped begin artificial respiration immediately (use mouth shield to avoid direct contact). **GET MEDICAL ATTENTION IMMEDIATELY**. Stay with casualty until medical assistance is obtained. Onset of pulmonary edema may be delayed; if victim feels unwell during the next 48 hours, get medical attention immediately.

Ingestion:

DO NOT INDUCE VOMITING. If casualty is alert and not convulsing, rinse mouth with water and give 2 to 4 cups of water or milk to dilute material. **IMMEDIATELY OBTAIN MEDICAL ATTENTION**. If spontaneous vomiting occurs, have casualty lean forward with head down to avoid breathing in of emesis. Rinse mouth thoroughly and administer 2 cups of water or milk. Avoid contact with emesis.

REFERENCES USED

CCINFO disc: Cheminfo

Budavari: The Merck Index, 12th ed., 1997

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 3, 1990

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION**Date Issued:**

March 10, 1989

Revision:

March 2012

MSDS:

6160-1

Proposed WHMIS Designation:

D1B; E

Prepared by: Caledon Laboratories Ltd. (905)

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