Potassium Hydroxide Solution (35-48%)

Date of Preparation: October 2003 Revision: 3

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Potassium Hydroxide Solution (35%-48%)
Chemical Formula: KOH
Other Designations: KOH-ULM; Caustic potash; Potassium hydroxide; Lye; Potassium hydrate; Potassium Hydroxide
General Use: Electroplating, lithography and photoengraving; in analytical chemistry and in organic synthesis; semiconductor industry.
Manufacturer: Kanto Corporation, 13424 N. Woodrush Way, Portland, OR 97203
Non-Emergency Contact: Customer Service, Phone (503) 283-0405, FAX (503) 240-0409

For Emergencies Call CHEMTREC at 1-800-424-9300

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% vol
Potassium Hydroxide	1310-58-3	35-48
Deionized Water	7732-18-5	61-52

Occupational Exposure Limits

	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
Ingredient	**TWA**	**STEL**	**TWA**	**STEL**	**TWA**	**STEL**	**IDLH**
Potassium Hydroxide	None established	None established	2 mg/m^3 (Ceiling)	None established	2 mg/m^3	None established	None established

Section 3 - Hazards Identification

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Corrosive! Causes severe burns to eye, skin, and respiratory tract. May cause serious lung damage. Repeated skin contact can cause dermatisis. Reacts with water producing excessive heat.

HMIS
H 3
F 0
R 1
PPE†
†Sec. 8

Potential Health Effects

Primary Entry Routes: Inhalation, skin and eye contact, ingestion
Target Organs: Skin, eyes, mucous membranes, and respiratory system.
Acute Effects

Inhalation: Vapors and mists are highly corrosive to the upper respiratory tract and are capable of causing severe burns. Inhalation of dust may be fatal due to spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis and severe pulmonary edema. Symptoms of overexposure include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.

Eye: Vapors and mists are extremely corrosive to the eyes and are capable of causing severe damage with loss of sight. Moderate eye irritation leading to inflammation is possible. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Skin: Vapors and mists are extremely corrosive to the skin and are capable of causing severe burns and ulceration; severe skin irritation after prolonged or repeated exposure. Contact dermatitis can develop which is characterized by skin redness and swelling and may progress to vesiculation, scaling and thickening of the epidermis. Repeated exposures may produce severe ulceration. Burns are not immediately painful; onset of pain may be delayed minutes or hours.

Ingestion: Ingestion may result in severe burns to the mouth, throat and stomach, pain, nausea and vomiting, swelling of the larynx and subsequent suffocation, perforation of the gastrointestinal tract.

Carcinogenicity: Not listed
Chronic Effects: None listed

Section 4 - First Aid Measures

Eye Contact: Gently lift eyelids and flush immediately and continuously with copious amounts of water for at least 15 minutes. Do not allow the victim to rub or keep eyes tightly shut. Consult an ophthalmologist immediately.

Skin Contact: Rinse with flooding amounts of water, while removing contaminated clothing, for at least 15 minutes. Wash with soap and water. Seek medical attention immediately. Wash clothing before reuse.

Ingestion: If the victim is conscious, give large amounts of water. Seek medical attention immediately. Never give anything by mouth to an unconscious or convulsing person.

Inhalation: Remove exposed person to an uncontaminated atmosphere and support breathing. If not breathing, give artificial respiration. Seek medical attention immediately.

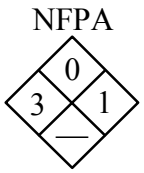
After first aid, seek appropriate in-plant, paramedic, or community medical support.

Note to Physicians: For acute or short-term repeated exposures to highly alkaline materials:

1. Oxygen is given as indicated.
2. The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
3. Alkali corrosives cause damage by liquefaction necrosis whereby the saponification of fats and solubilization of proteins allow deep penetration into the tissue. Burns are not readily apparent due to the delayed onset of symptoms and pain.

Section 5 - Fire-Fighting Measures

Flash Point: Nonflammable
Autoignition Temperature: Not applicable
LEL: Not applicable
UEL: Not applicable



Flammability Classification: Noncombustible.
Extinguishing Media: Water spray, carbon dioxide, or foam.
General Fire Hazards/Hazardous Combustion Products: Containers may burn when exposed to fire. Solid in contact with water or moisture is highly alkaline and can produce heat. May release flammable hydrogen gas when heated to decomposition.
Fire Incompatibility: The material is corrosive to aluminum, zinc and tin producing highly flammable hydrogen gas.
Fire-Fighting Instructions: Contact fire department and tell them location and nature of hazard. Prevent spillage from entering drains or waterways. Do not approach containers suspected to be hot. Cool fire-exposed containers with water spray from a protected location. If safe to do so, remove containers form path of fire. Avoid spraying water onto liquid pools.
Fire-Fighting Equipment: Because fire produces toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full-face piece operated in pressure-demand or positive-pressure mode. Equipment should be thoroughly decontaminated after use.

Section 6 - Accidental Release Measures

Small Spills: Clean up all spills immediately. Use protective equipment including respiratory protection. Contain spill and absorb with inert material. Place in suitable containers for disposal. Neutralize residue with dilute acetic acid.
Large Spills: Contact fire department and tell them location and nature of hazard. Clear area of personnel and move upwind. Wear full body protective clothing with breathing apparatus. Prevent spillage from entering drains or waterways. Stop leak if safe to do so. Absorb with dry, inert material and place in labeled drums for disposal. Neutralize residue with dilute acetic acid. If contamination of drains or waterways occurs, advise emergency services. After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and reusing.
Regulatory Requirements: Follow applicable OSHA regulations (29 CFR 1910.120).

Section 7 - Handling and Storage

Handling Precautions: Avoid contact with skin and eyes from liquid or vapors. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Handle and open container with care. Avoid contact with incompatible materials. Avoid physical damage to containers. Contact with water generates heat. Keep containers securely sealed when not in use.
Recommended Storage Methods: Store in a cool (32°F+ for 45% or 59°F+ for 48%), dry, well-ventilated area away from incompatible substances. Store with other corrosives.
Regulatory Requirements: Follow applicable OSHA regulations.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls
Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.
Administrative Controls
Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance and Odor: Clear and odorless.
Vapor Pressure: 2.6 mm Hg @ 20°C
Vapor Density (Air=1): >1
Formula Weight: 56.1
Density: 1.45 (45%)
Specific Gravity (H_2O=1, at 4 °C): 1.5

Water Solubility: 100%
Boiling Point: 280°F
Freezing: 48°F
Viscosity: 3.7 cP
% Volatile: Negligible
Evaporation Rate: No data
pH: ~13.5

Section 10 - Stability and Reactivity

Stability: Product is considered stable under normal handling conditions.

Polymerization: Hazardous polymerization will not occur.

Chemical Incompatibilities: Water, strong oxidizers, reducing agents, strong acids and organic materials, nitro compounds, trichloroethylene, aluminum, tin, zinc, lead, magnesium, and sodium.

Conditions to Avoid: Direct heat and sunlight, which can cause partial decomposition of potassium hydroxide.

Hazardous Decomposition Products: Flammable hydrogen gas can be released upon decomposition.

Section 11- Toxicological Information*

TOXICITY
Oral (rat) LD_{50}: 273 mg/kg

IRRITATION
Skin (human): 50 mg/24h - Severe
Skin (rabbit): 50 mg/24h - Severe
Eye (rabbit): 1 mg/24h rinse-Moderate

* See NIOSH, *RTECS (TT 2100000)*, for additional data.

Section 12 - Ecological Information

Ecotoxicity: Mosquito fish, LC_{50}: 80 ppm/24 hr.

Environmental Fate: Expected to decompose in the environment. Exposure to aquatic organisms can be severe due to the high pH of the solution.

Section 13 - Disposal Considerations

Disposal: Recycle wherever possible or consult manufacturer for recycling options. Treat and neutralize with dilute acid at an effluent treatment plant. Recycle containers; otherwise dispose of in an authorized landfill.

Disposal Regulatory Requirements: See Federal, state, and local regulations.

Section 14 - Transport Information

DOT Transportation Data (49 CFR 172.101)

Shipping Name: Potassium hydroxide, solution
Hazard Class: 8
ID No.: UN1814
Packing Group: II
Label: 8
Special Provisions (172.102): B2, IB2, T7, TP2

Packaging Authorizations
Exceptions: 173. 154
Non-bulk Packaging: 173.202
Bulk Packaging: 173.242

Quantity Limitations
Passenger, Aircraft, or Railcar: 1L
Cargo Aircraft Only: 30L

Vessel Stowage Requirements
Vessel Stowage: A

Emergency Response Guidebook #154

Section 15 - Regulatory Information

EPA Regulations:
RCRA Hazardous Waste Number (40 CFR 261.22): D002
RCRA Hazardous Waste Classification (40 CFR 261.22): Characteristics of Corrosivity

CERCLA Hazardous Substance (40 CFR 302.4) listed specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307(a), CAA, Sec. 112
CERCLA Reportable Quantity (RQ): 1000 lb (454 kg)
SARA 311/312 Codes: Acute, Reactive
SARA Toxic Chemical (40 CFR 372.65): Not listed
SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not listed
TSCA: Listed

OSHA Regulations:
Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Listed

Section 16 - Other Information

Revision Notes: Revision 3: Corrections to Section 2 and 9.
..... Revision 2: Revisions to Sections 7, 9, 14, and 15.
..... Revision 1: Change to 16-section format.

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