Oltrin Solutions, LLC

Product Safety Summary for

Sodium Hydroxide Solution, 30-52%

Chemical Identity

Substance Name:	Sodium Hydroxide
CAS number:	1310-73-2
Synonyms:	Caustic Soda, Caustic, Lye
Chemical Formula:	NaOH

Product Uses

Sodium hydroxide serves a wide range of end use markets. Major industrial users of sodium hydroxide include the pulp and paper manufacturing, detergent, and chemical industries. Other significant users are the alumina, oil and gas, and textile industries.

Sodium hydroxide is often used as an intermediate in the manufacture of other chemicals or as a processing aid when certain pH conditions are needed. In water treatment, for example, sodium hydroxide is used for its neutralization property. Also, because it can effectively dissolve grease, sodium hydroxide is used as a cleaning agent in the food and recycling industries. Common consumer products containing sodium hydroxide are detergents, soaps, and drain cleaners.

Physical/Chemical Properties

Pure sodium hydroxide is a white solid at room temperature, though Oltrin Solutions, LLC markets it only as an aqueous solution (32% or 50%). Sodium hydroxide is a strong alkaline substance that dissociates completely in water into the sodium ion (NA^{+}) and hydroxyl ion (OH). This dissociation is strongly exothermic, so a vigorous reaction occurs when sodium hydroxide is added to water. Some additional physical and chemical properties are listed below for the 50% solution:

Color	Clear
Odor	Odorless
pH	14
Relative Density	1.53 at 20°C (68°F)
Freezing Point	11.67°C (53.01°F)
Boiling Temperature	142°C (287.6°F)
Vapor Pressure	23.76 mmHg (approximately) at 25°C (77°F)
Solubility in Water	100%

Additional physical and chemical property information is available on the Sodium Hydroxide Solution Safety Data Sheet (SDS).

Human Health Information

Sodium hydroxide solutions are strongly alkaline with a 50% solution having a pH of 14. Due to this, sodium hydroxide is a severe eye, skin, and respiratory tract irritant, and it can burn tissue with which it comes in contact. Eye contact is a serious hazard, as it can cause severe irritation and possible blindness.

Inhaling aerosols of sodium hydroxide may result in irritation of the nose and throat. Ingesting sodium hydroxide may cause digestive tract burns.

Additional data on acute and chronic health effects can be found on the product Safety Data Sheet (SDS).

Environmental Information

Persistence & Degradability	Expected to degrade rapidly in air.
Bioaccumulation	Not expected to bioaccumulate.
Aquatic Life	Harmful to aquatic life.

For more data, see product Safety Data Sheet (SDS).

Potential Exposure

The most likely ways exposures can occur are:

- **Manufacturing or Industrial Workplace Exposure:** Exposure could occur in the manufacturing facility or in industrial facilities that use sodium hydroxide. Typical exposures are to the skin or eyes during maintenance, sampling, or testing. Where possible, control exposure hazards through engineered and administrative controls. Otherwise, follow good industrial hygiene practices and utilize personal protective equipment.

- **Consumer Exposure:** Oltrin Solutions, LLC does not sell sodium hydroxide in retail stores, though it may be an ingredient in some consumer products. Exposure to these products is deemed safe if used in accordance with the label instructions.

- **Environmental Exposure:** Release to the environment may occur during the manufacture, storage, or transport of sodium hydroxide. If a spill occurs, emergency personnel should wear protective equipment to minimize exposures. If possible, dike any spilled material to prevent the flow of material to drains or water courses. Absorb spill with inert material (dry sand or earth) and place in chemical waste container. Flush area with water.

More information on prevention and mitigation of potential exposures is available in the product Safety Data Sheet.

Risk Management

Sodium hydroxide is non-flammable, non-explosive, and non-toxic. It is, however, an alkaline material and poses hazards to the skin and eyes. Sodium hydroxide can react with certain materials of construction. *Prior to using sodium hydroxide, carefully read and understand the Safety Data Sheet.*

The following are some risk management measures that are effective against these hazards:

- Provide eyewash fountains and safety showers in areas where sodium hydroxide is used or handled. Flush areas of the body that have come in contact with sodium hydroxide with large amounts of water, and then seek medical attention. DO NOT use any kind of neutralizing solution, particularly in the eyes, without direction from a physician.
- To prevent eye contact during use or handling, protective eye wear (such as splash goggles, a full face shield, or safety glasses with side shields) must be worn.
- Work areas where sodium hydroxide is used should be well-ventilated to maintain concentrations below exposure limits. If exposures exceed accepted limits or if respiratory discomfort is experienced, use a NIOSH approved air purifying respirator with high efficiency particulate filters.
- Wear appropriate chemical resistant clothing and gloves. Suitable materials include natural rubber, neoprene, and nitrile. Gloves should be long enough to come well above the wrist, and sleeves should be positioned securely over the glove wrists.
- Sodium hydroxide causes leather to disintegrate rapidly. For this reason, wear rubber boots. Wear the bottoms of trouser legs outside the boots. DO NOT tuck in.
- When making solutions, always add the sodium hydroxide slowly to the surface of the water with constant agitation. Never add the water to the sodium hydroxide. Always start with lukewarm water (80 -100°F). Never start with hot or cold water. Dangerous boiling or splattering can occur if sodium hydroxide is added too rapidly, or allowed to concentrate in one area, or added to hot or cold liquids. Care must be taken to avoid these situations.
- Residues that dry on equipment can cause irritation. Keep equipment clean by promptly washing off any accumulation.
- Equipment used for sodium hydroxide storage or processing should be constructed of the proper materials. For example, bulk storage containers should be constructed of mild steel carbon or stainless steel. Do not use aluminum as a material of construction.
- The packing glands of pumps used in sodium hydroxide service should be shielded to prevent spraying in the event of a leak.
- A safety shield of wrap-around polypropylene is recommended for all flanged joints. This will protect personnel against spraying in case a gasket leaks.

- Provide unloading lines for sodium hydroxide solution with a sign to notify truck drivers of the correct line for connection. Recommended sign wording is Sodium Hydroxide Only, UN1824.

Product Stewardship

Additional technical assistance regarding physical property data and specific information for storing, unloading, and using sodium hydroxide, can be requested from Oltrin Solutions, LLC. See contact information below.

Regulatory Information

The following is a summary of regulations and guidelines that pertain to sodium hydroxide (additional regulations and guidelines may apply):

- Sodium hydroxide (including solutions) is designated as a hazardous substance under Section 311(b) (2) of the Clean Water Act. See 40 CFR 116.4.
- Under the Comprehensive Environmental Resource and Conservation Liability Act (CERCLA) any release of 1000 pounds or more of sodium hydroxide to the environment within a 24-hour period, not specifically allowed by a permit, must be reported to the National Response Center (NRC).
- Sodium hydroxide is regulated by the Department of Transportation (DOT) as a corrosive hazardous material.
- The Occupational Safety and Health Administration has established a Permissible Exposure Limit for sodium hydroxide. The limit is 2 mg/m^3 averaged over an 8-hour period.
- The American Conference of Governmental Industrial Hygienists has established a Threshold Limit Value for sodium hydroxide. The guideline is 2 mg/m^3 as a ceiling limit.
- The National Institute for Occupational Safety and Health has established an Immediately Dangerous to Life and Health concentration for sodium hydroxide. The concentration is 10 mg/m^3.

Sources for Additional Information

- American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values and Biological Exposure Indices, 6th ed., 1 (1991), Sodium hydroxide and corresponding entry in “Pocket Guide” 1997-1998.
- Canadian Centre for Occupational Health and Safety (CCOHS), Chemical Profile, Health Effects of Sodium Hydroxide, January 1998.
- Clayton, G.D. and Clayton, F.E., Patty's Industrial Hygiene and Toxicology, 4th ed., John Wiley & Sons, Inc., pp. 766+, 1994.

- Grant, W. Morton (1986). Toxicology of the Eye, Clarence C. Thomas, Pub.
- Hazardous Substances Data Bank (HSDB), HSDB Number 229 for Sodium Hydroxide.
- Oltrin Solutions, LLC Safety Data Sheet at our web site: http://www.trinitymfg.com
- Registry of Toxic Effects of Chemical Substances (RTECS), RTECS NumberWB4900000, Review Date: February 2008.

Contact Information

For additional information, call Oltrin Customer Service at (910) 410-1180.

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This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information, or treatment information. For in-depth safety and health information, refer to the product's Safety Data Sheet (SDS), the product's label, and other safe use and handling literature for the chemical substance.