

**Material Safety Data Sheet**

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**Section I - Chemical Product And Company Identification**

**Product Name: Sodium Hydroxide Flake (Caustic Soda Flake)**  
CAS Number: 1310-73-2    HBCC MSDS No. CC10800



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**Section II - Composition/Information On Ingredients**

Chemical Name	CAS Number	%	Exposure Limits (TWAs) in Air		
			ACGIH TLV	OSHA PEL	STEL
Sodium Hydroxide	1310-73-2	95-99	2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>

**Section III - Hazard Identification**

**Routes of Exposure:** Sodium hydroxide can affect the body if it is inhaled or if it comes in contact with the eyes or skin. It can also affect the body if it is swallowed.

**Summary of Acute Health Hazards**

**Ingestion:** Swallowing sodium hydroxide may cause severe burns of the mouth, throat, esophagus, and stomach. Death may result. Severe scarring of the throat may occur on recovery after swallowing sodium hydroxide. Symptoms may include sneezing, bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appear days after exposure. An increased number of esophageal cancer cases have been reported to occur in individuals who have scarring of the esophagus from swallowing sodium hydroxide.

**Inhalation:** Effects from inhalation of the dusts, mists, or spray will vary from mild irritation to destructive burns depending on the severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Severe pneumonitis may occur.

**Skin:** Contact of the skin may cause skin irritation and, with greater exposure, severe burns with scarring(a period may exist between exposure and sense of irritation).

**Eyes:** Sodium hydroxide is destructive to eye tissues on contact. Will cause severe burns that result in damage to the eyes and even blindness. Contact lenses should not be worn when working with this chemical. Even a small amount in the eye can cause blindness.

**Summary of Chronic Health Hazards:** The chronic local effect may consist of multiple areas of superficial destruction of the skin or of primary irritant dermatitis. Similarly, inhalation of dust, spray, or mist may result in varying degrees of irritation or damage to the respiratory tract tissues and an increased susceptibility to

respiratory illness.

**Signs and Symptoms of Exposure:** A physician should be contacted if anyone develops any signs or symptoms and suspects that they are caused by exposure to sodium hydroxide.

**Effects of Overexposure:** Sodium hydroxide is a strong alkali and is corrosive to any tissue with which it comes in contact.

**Medical Conditions Generally Aggravated by Exposure:** Sodium hydroxide is a respiratory irritant. Persons with pre-existing skin disorders or eye problems or impaired pulmonary function may be at increased risk from exposure.

**Note to Physicians:** Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the uses of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required.

#### Section IV - First Aid Measures

**Ingestion:** If the person is conscious, give large quantities of water immediately to dilute the sodium hydroxide. DO NOT INDUCE VOMITING! GET MEDICAL ATTENTION IMMEDIATELY.

**Inhalation:** Move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. If breathing is difficult, give oxygen. Keep the affected person warm and at rest. GET MEDICAL ATTENTION IMMEDIATELY.

**Skin:** Immediately flush contaminated skin with water. If large areas of the body are contaminated or if clothing is penetrated, immediately use safety shower, removing clothing while under the shower. Flush exposed areas with large amounts of water for at least 15 minutes. GET MEDICAL ATTENTION IMMEDIATELY. Wash clothing before reuse. Destroy contaminated shoes.

**Eyes:** Immediately flush eyes with a directed stream of water for at least 15 minutes. Forcibly hold eyelids apart to ensure complete irrigation of all eye and lid tissue. Washing eyes within 1 minute is essential to achieve maximum effectiveness. GET MEDICAL ATTENTION IMMEDIATELY. Contact lenses should not be worn when working with this chemical.

#### Section V - Fire Fighting Measures

**Flash Point:** N/A

**Autoignition Temperature:** Not Flammable

**Lower Explosive Limit:** N/A

**Upper Explosive Limit:** N/A

**Unusual Fire and Explosion Hazards:** Not combustible but solid form in contact with moisture or water may generate sufficient heat to ignite combustible materials.

**Extinguishing Media:** Foam, carbon dioxide, or dry chemicals may be used where this product is stored. Adding water to caustic solution generates large amounts of heat.

**Special Firefighting Procedures:** This product is not combustible. Full protective clothing and self-contained breathing apparatus should be worn in areas where product is stored. Avoid direct contact of this product with water as this can cause violent exothermic reaction. Contact with some metals (particularly magnesium, aluminum and galvanized zinc) can rapidly generate hydrogen, which is explosive.

## Section VI - Accidental Release Measures

Only trained personnel equipped with NIOSH approved, full facepiece combination dust/mist respirators should be permitted in area. Leaks should be stopped. Spills should be contained and cleaned up immediately. Spills should be removed by using a vacuum truck. Neutralize remaining traces of material with any dilute inorganic acid such as hydrochloric, sulfuric, nitric, phosphoric, or acetic acid. The spill area should then be flushed with water, followed by liberal covering of sodium bicarbonate. All clean-up material should be removed and placed in approved containers, labeled and stored in a safe place to await proper treatment or disposal. Spills on areas other than pavement (dirt or sand) may be handled by removing the affected soils and placing in approved containers. Persons not wearing protective equipment and clothing should be restricted from areas of spills until cleanup has been completed.

## Section VII - Handling and Storage

Wear appropriate personal protective equipment when handling this product. Prevent possible eye and skin contact by wearing protective clothing and equipment. Storage tanks must be vented and diked. Store drums of sodium hydroxide separate from acids, metals and explosives. Provide adequate drainage. When diluting, use agitation and add concentrated sodium hydroxide to water at a controlled rate to control heat of dilution and to avoid splattering. Do not add water to sodium hydroxide. Do not store with aluminum or magnesium.

**Other Precautions:** Sodium hydroxide reacts with reducing sugars such as fructose, lactose, maltose, galactose, levulose, and arabinose to form carbon monoxide. While the potential for worker exposure to carbon monoxide may be small, a potential does exist during cleaning of certain dairy and possibly other industry equipment. Carbon monoxide gas can form upon contact with food and beverage products in enclosed spaces and can cause death. Follow appropriate tank entry procedures.

**Special Mixing and Handling Instructions:** Considerable heat is generated when water is added to sodium hydroxide; therefore, when making solutions always add the sodium hydroxide to the water with constant stirring. The water should always be lukewarm (80° - 100° F). Never start with hot or cold water. If sodium hydroxide becomes concentrated in one area, or if added too rapidly, or if added to hot or cold water, a rapid temperature increase can result in dangerous boiling and/or spattering or may cause an immediate violent eruption.

## Section VIII - Exposure Controls/Personal Protection

**Respiratory Protection:** Good industrial hygiene practices recommend that engineering controls are used to reduce environmental concentrations to the permissible exposure level. However, there are some exceptions where respirators may be used to control exposure. Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. If the use of respirators is necessary, the only respirators permitted are those that have been approved by the Mine Safety and Health Administration or by the National Institute for Occupational Safety and Health.

**Ventilation:** Special ventilation is not usually required for sodium hydroxide solutions. Avoid creation of mist or spray. Provide local exhaust systems. Where carbon monoxide may be generated, special ventilation may be required.

**Protective Clothing:** Employees should be provided with and required to use impervious clothing, gloves, face shield (eight-inch minimum), and other appropriate protective clothing necessary to prevent any possibility of skin contact with solutions

of sodium hydroxide. Materials suggested for use are natural rubber, butyl rubber, neoprene, or vinyl.

**Eye Protection:** Employees should be provided with and required to use dust- and splash-proof safety goggles where there is any possibility of sodium hydroxide contacting the eyes. Contact lenses should not be worn when working with this chemical.

**Other Protective Clothing or Equipment:** Impervious protective clothing and chemically resistant safety shoes should be worn to minimize contact. Eyewash stations and safety showers must be available in the immediate work area for emergency use.

**Work/Hygienic Practices:** Wash hands thoroughly with soap and water before eating, drinking, smoking or using toilet facilities. Do NOT place food, coffee or other drinks in the area where dusting or splashing of solutions is possible.

### Section IX - Physical and Chemical Properties

**Physical State:** Solid, Flake

**pH:** 12.0

**Melting Point/Range:** 310°C; 590°F

**Boiling Point/Range:** 1388°C; 2530°F

**Appearance/Color/Odor:** Clear white solid with no odor

**Solubility in Water:** 347 g/100g water @ 100°C

**Vapor Pressure(mmHg):** 42 @ 1000°C; 1832°F

**Specific Gravity(Water=1):** 2.13 @ 20°C; 68°F

**Molecular Weight:** N/A

**Vapor Density(Air=1):** N/A

**% Volatiles:** < 50%

**Freezing Point:** 318°C; 604°F

**How to detect this compound:** Sampling and analyses may be performed by collection of sodium hydroxide in a glass bubbler containing hydrochloric acid, followed by subsequent titration. Also, detector tubes certified by NIOSH under 42 CFR Part 84 or other direct-reading devices calibrated to measure sodium hydroxide may be used.

### Section X - Stability and Reactivity

**Stability:** Stable

**Hazardous Polymerization:** Will not occur

**Conditions to Avoid:** Overheating in storage accelerates corrosion.

**Materials to Avoid:** Contact with water, acids, flammable liquids, and organic halogen compounds, especially trichloroethylene, may cause fires and explosions. Contact with metals such as aluminum, tin, chromium, brass, bronze, and zinc and alloys containing these metals causes formation of flammable hydrogen gas. Contact with nitromethane and other similar nitro compounds cause formation of shock-sensitive salts. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Reactions with various food sugars may form carbon monoxide.

**Hazardous Decomposition Products:** Carbon monoxide

### Section XI - Toxicological Information

Sodium hydroxide is a strong alkali; the mist, dust and solutions cause severe injury to the eyes, mucous membranes, and skin. Although inhalation is usually of secondary importance in industrial exposures, the effects from the dust or mist will vary from mild irritation of the nose at 2 mg/m<sup>3</sup> to severe pneumonitis, depending on the severity of exposure. The greatest industrial hazard is rapid tissue destruction

of eyes or skin upon contact with either the solid or with concentrated solutions. Contact with the eyes causes disintegration and sloughing of conjunctival and corneal epithelium, corneal opacification, marked edema, and ulceration; after 7 to 13 days either gradual recovery begins, or there is progression of ulceration and corneal opacification. Complications of severe eye burns are symblepharon (adhesion of the lid to the eyeball) with overgrowth of the cornea by a vascularized membrane, progressive or recurrent corneal ulceration, and permanent corneal opacification. On the skin, solutions of 25 to 50% cause the sensation of irritation within about 3 minutes; with solutions of 4%, this does not occur until after several hours. If not removed from the skin, severe burns with deep ulceration will occur; exposure to the dust or mist may cause multiple small burns, with temporary loss of hair. Ingestion produces severe pain in the esophagus and stomach, corrosion of the lips, mouth, tongue, and pharynx and the vomiting of large pieces of mucosa; cases of squamous cell carcinoma of the esophagus have occurred with latent periods of 12 to 42 years after ingestion; these cancers may have been sequelae of tissue destruction and possibly scar formation rather than from a direct carcinogenic action of sodium hydroxide itself. Sodium hydroxide: irritation data: skin, rabbit: 500 mg/24H; severe; eye rabbit: 50 ug/24H severe. Investigated as a mutagen. LDLo (rabbit) 500 mg/kg. Corrosive.

## Section XII - Ecological Information

### Ecotoxicological Information:

Highly toxic to aquatic life. 240 ug/l (Bluegill) 96-hour TLM LC50

## Section XIII - Disposal Considerations

The materials resulting from clean-up operations may be hazardous waste and, therefore subject to specific regulations. Package, store, transport and dispose of all clean-up materials and any contaminated equipment in accordance with all applicable federal, state and local environmental health regulations. Shipments of waste materials are subject to manifesting requirements per applicable regulations. Dispose in approved chemical disposal area or in a manner which complies with all local, state and federal regulations. **Do not flush to sewer.**

## Section XIV - Transport Information

**DOT Proper Shipping Name:** Sodium Hydroxide, Solid

**DOT Hazard Class/ I.D. No.:** 8, UN1823, II

## Section XV - Regulatory Information

**Reportable Quantity:** 1000 Pounds (454 Kilograms)

All components of this product are listed on the TSCA Inventory.

**CERCLA Hazardous Substance:** Listed in Table 302.4 of 40 CFR Part 302 as a hazardous substance with a reportable quantity of 1000 pounds. Releases to air, land or water which exceed the RQ must be reported to the National Response Center, 800-424-8802.

**NFPA Rating:** Health - 3; Flammability - 0; Instability - 1

0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

**Carcinogenicity Lists:** NTP: No **IARC Monograph:** No **OSHA Regulated:** Yes

## Section XVI - Other Information

**Synonyms/Common Names:** Sodium Hydroxide; Soda Lye; Lye; Caustic Soda

**Chemical Family/Type:** Alkali

**Sections changed since last revision:** I, II, III, V, VI, VII, IX, X, XI, XII, XV

**IMPORTANT!** Read this MSDS before use or disposal of this product. Pass along the

information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, **Hill Brothers Chemical Company** makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.