CALEDON LABORATORY CHEMICALS

MATERIAL SAFETY DATA SHEET

SODIUM HYDROXIDE

PRODUCT CODE NUMBER(S): 7860-1, 7860-4

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: *Sodium hydroxide; Caustic soda, lye*
Chemical Family: *Alkali hydroxide*
Chemical Formula: *NaOH*
Product Use: *Laboratory reagent*
Manufacturer's Name and Address:
Caledon Laboratories Ltd.
40 Armstrong Avenue
Georgetown, Ontario L7G 4R9
Telephone No: *(905) 877-0101*
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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	*%*	*TLV Units*	*CAS No.*
Sodium hydroxide	*99*	*2 mg/m^3*	*1310-73-2*

PHYSICAL DATA

Physical State: *Solid*
Odour and Appearance: *White deliquescent pellets, odourless.*
Odour Threshold (ppm): *Not applicable*
Vapour Pressure (mm Hg): *1 mm Hg @ 739°C*
Vapour Density (Air = 1): *Not applicable*
Evaporation Rate: *Not applicable*
Boiling Point (°C): *1390°C*
Melting Point (°C): *318°C*
pH: *14 (5% aqueous solution)*
Specific Gravity: *2.13 @ 20°C*
Coefficient of Water/Oil distribution: *Essentially 0*

SHIPPING DESCRIPTION

UN: *1823*
T.D.G. Class: *8*
Pkg. Group: *II*

REACTIVITY DATA

Chemical Stability: *Stable. Deliquescent. Absorbs water from air, forming wet solid. Can also absorb CO_2 from air (forming sodium carbonate).*
Incompatibility with other substances: *Reacts vigorously, violently with water and many other common chemicals, generating enough heat to ignite nearby combustible materials. Reacts violently or explosively with many organic or inorganic chemicals, such as strong oxidizing agents, strong acids, organohalogen compounds, chlorinated solvents. Releases flammable/explosive hydrogen gas on contact with sodium tetraborate or metals such as aluminum, tin, zinc, lead. Contact with nitromethane or similar nitro compounds may cause formation of shock-sensitive salts. Can form spontaneously flammable chemicals on contact with 1,2-dichooroethylene, trichloroehtylene, or tetrachloroethane. Can produce CO on contact with solutions of sugars. Corrosive to most metals. For complete list of hazardous reactive chemicals refer to NFPA: Fire Protection Guide to Hazardous Materials, 11th ed., 1994, and Bretherick: Bretherick's Handbook of Reactive Chemcial Hazards, 4th ed., 1990.*
Reactivity: *Absorbs water and carbon dioxide from the air. Protect from water, moisture, air. Avoid all incompatible and combustible materials, generation of dust or mist.*
Hazardous Decomposition Products: *Hydrogen gas, sodium oxide fumes.*

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 hydrogen gas on contact with metals or sodium tetraborate.*
Extinguishing Media: *Carbon dioxide, dry chemical foam. If only water is available, use it in flooding quantites in the form of a spray or fog to absorb heat, cool containers, but prevent it from coming into direct contact with sodium hydroxide. Prevent runoff from entering sewers or waterways.*
Unusual Hazards: *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, and contact with skin and eyes.*
Flash Point (Method Used): *Not applicable*
Autoignition Temperature: *Not applicable*
Upper Flammable Limit (% by volume): *Not applicable*
Lower Flammable Limit (% by volume): *Not applicable*
Hazardous Combustion Products: *Emits toxic and corrosive fumes under fire conditions.*
Sensitivity to Impact: *None identified*
Sensitivity to Static discharge: *None identified*

TOXICOLOGICAL PROPERTIES AND HEALTH DATA

Toxicological Data:

LD_{50}: *(dermal, rabbit) 500 mg/24h (severe)*
LC_{50}: *Not available*

Effects of Acute Exposure to Product:

Inhaled: *Corrosive. Does not readily form vapour and is deliquescent so is not likely to form dust. Aerosols (may be formed when water is poured on solid) may cause severe irritation and burns 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, hemoconcentraction, and moist rales) may appear several hours after exposure.*
In contact with skin: *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 (solutions) and duration of exposure. Solutions as weak as 0.12% have damaged healthy skin within 1 hour. A 4% solution applied to a volunteer's arm for 15 to 180 minutes caused damage which progressed from destruction of cells of the outer layer within 15 minutes to total destruction of all layers of skin in 60 minutes.*
In contact with eyes: *Extremely corrosive. Solid will absorb moisture from eye or from water being used for removal and form highly*

concentrated solution. May cause severe irritation and burns with corneal injury and can result in permanent impairment of vision, even blindness.

Ingested: *Causes gastrointestinal irritation or ulceration, and severe burns of the mouth, throat, and stomach. May cause perforation of the esophagus or stomach with vomiting, severe abdominal pain, collapse and death.*

Effects of Chronic Exposure to Product:

Proplonged or repeated skin exposure would be assumed to cause irritation and burns that would eventually lead to disease. However, since strong and immediate irritation would normally deter workers from further exposure, chronic exposure has not been reported. Repeated or prolonged inhalation may cause productive cough, bronchopneumonia, pulmonary edema, reduction of pulmonary function.

Carcinogenicity: *Has been shown to cause cancer of the esophagus and skin cancers following severe skin burns. Cancer may be due to tissue destruction and scarring rather than the chemical.*

Teratogenicity: *No human or animal information available*

Reproductive Effects: *No human or animal information available*

Mutagenicity: *Negative in in vitro and bacterial testing.*

Synergistic Products: *None known*

PREVENTIVE MEASURES

Engineering Controls:- *Local corrosion-proof exhaust ventilation required.*

Respiratory Protection: *Up to 10 mg/m^3, 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: *Safety goggles and face shield.*

Skin Protection: *Greater than 70%: neoprene rubber, polyvinyl chloride,Trellchem HPS, Tychem BR/LV gloves. 30-70%: butyl, natural, nitrile, or neoprene rubber, polyethylene, polyvinyl chloride, Viton , Viton /Butyl rubber, Barrier (PE/PA/PE)Silver Shield/4H (polyethylene /ethylene vinyl alcohol), Responder , Trellchem HPS, Tychem BR/LV, Tychem SL, Tychem TK gloves. Other impervious protective clothing, sleeves, apron, coveralls, boots, sufficient to prevent contact.*

Other Personal Protective Equipment: *Safety shower and eyebath in immediate work area.*

Leak and Spill Procedure: *Evacuate area. Eliminate all ignition sources. Cleanup personnel must be thoroughly trained in the hazards of this material and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists, and contact with skin, eyes or clothing. DO NOT TOUCH SPILLED MATERIAL. Contain spill with inert material. Prevent from entering sewers and waterways. Neutralize solutions carefully with dilute acid (may generate heat and fumes, wear respiratory equipment to avoid exposure), and collect in appropriate containers for disposal. Carefully flush the spill area with copious amounts of water.*

Waste Disposal: *Follow all federal, provincial, and local regulations.*

Handling Procedures and Equipment: *EXTREMELY CORROSIVE MATERIAL. Personnel working with this product must be thoroughly trained in its hazards and its safe use and must wear appropriate protective equipment and clothing. Prevent all eye and skin contact. Avoid inhalation of mist or dust. 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. When diluting, always add solid to liquid, sprinkling solid slowly over surface of lukewarmwater, 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. Do not expose sealed containers to temperatures above 40°C.*

FIRST AID MEASURES

SPEED IN REMOVING SODIUM HYDROXIDE FROM CONTACT WITH TISSUE IS OF PRIMARY IMPORTANCE. DELAY CAN RESULT IN SERIOUS INJURIES.

Specific Measures:

Eyes: *IMMEDIATELY flush eyes with gently running water for at least sixty (60) minutes, without interruption, holding eyelids open while flushing. You may have 10 seconds or less to avoid serious permanent injury. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact. Get MEDICAL ATTENTION IMMEDIATELY. Continue flushing while casualty is moved to medical facility if possible, or else do not move from water access without the advice of qualified medical personnel. Damage may be delayed or may occur in the absence of pain or irritation, so strict adherence to these first aid measures is essential.*

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. Get MEDICAL ATTENTION IMMEDIATELY even if there is no pain (see Specific Measures for "Eyes"). 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. If breathing and pulse are absent give CPR (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 72 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

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: *November 1, 1988*

Revision: *October 2011*

MSDS: *7860-1, 7860-4*

Proposed Whmis Designation: *E*

Prepared by: Caledon Laboratories Ltd. (905) 877-0101