

MSDS MATERIAL SAFETY DATA SHEET

Effective Date: 08/02/01

CHEMTREC: 800-424-9300 (USA)

703-527-3887(Outside USA and Canada)

CANUTEC: 613-996-6666

From: Mallinckrodt Baker, Inc

222 Red School Lane Phillipsburg, NJ 08865

NOTE: Use CHEMTREC and CANUTEC phone numbers only in the event Emergency Telephone Number: 908-859-2151 of a chemical emergency. All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM HYDROXIDE SOLUTIONS (MORE THAN 10% NaOH)

1. Product Identification

Synonyms: Caustic soda solution; lye solution; sodium hydroxide liquid; sodium hydrate solution, Sodium Hydroxide Concentrate Solution StandARd®, Sodium Hydroxide, DILUT-IT® Analytical Concentrates, sodium hydroxide volumetric solutions CAS No.: 1310-73-2 Molecular Weight: 40.00 Chemical Formula: NaOH in water Product Codes: J.T. Baker: 0337, 0338, 0339, 3719, 3725, 3727, 3729, 4689, 4690, 5000, 5661, 5666, 5668, 5669, 5671, 5672, 5674, 5676

Mallinckrodt: 6290, 7701, 7702, 7703, 7705, 7706, 7775, H369, H382, H385, V038, V679

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Hydroxide	1310-73-2	10 - 60%	Yes
Water	7732-18-5	40 - 90%	No

3. Hazards Identification

Emergency Overview POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS. J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience) Health Rating: 3 - Severe (Poison) Flammability Rating: 0 - None Reactivity Rating: 2 - Moderate Contact Rating: 4 - Extreme (Corrosive) Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES Storage Color Code: White Stripe (Store Separately) Potential Health Effects Inhalation: Severe irritant. Effects from inhalation of mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Severe pneumonitis may occur. Ingestion: Corrosive! Swallowing may cause severe burns of mouth, throat, and stomach. Severe scarring of tissue and death may result. Symptoms may include bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appear days after exposure. Skin Contact: Corrosive! Contact with skin can cause irritation or severe burns and scarring with greater exposures. Eye Contact: Corrosive! Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness. Chronic Exposure: Prolonged contact with dilute solutions or dust has a destructive effect upon tissue. Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. Ingestion: DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately. Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse. Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately. Note to Physician: Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use 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.

5. Fire Fighting Measures

Fire: Not considered to be a fire hazard. Hot or molten material can react violently with water. Can react with certain metals, such as aluminum, to generate flammable hydrogen gas. Explosion: May cause fire and explosions when in contact with incompatible materials. Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire. Adding water to caustic solution generates large amounts of heat. Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. J. T. Baker NEUTRACIT®-2 or BuCAIM® caustic neutralizers are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Store above 16C (60F) to prevent freezing. Always add the caustic to water while stirring; never the reverse. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not store with aluminum or magnesium. Do not mix with acids or organic materials.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits: - OSHA Permissible Exposure Limit (PEL): 2 mg/m³ Ceiling- ACGIH Threshold Limit Value (TLV): 2 mg/m³ Ceiling Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details. Personal Respirators (NIOSH Approved): If the exposure limit is exceeded and engineering controls are not

feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Physical data is displayed for 10%, 30% and 50% aqueous sodium hydroxide solutions. (Merck Index). Appearance: Clear, colorless solution. Odor: Odorless. Solubility: Completely miscible with water. Density: 10% solution - 1.11; 30% solution - 1.33; 50% solution - 1.53 pH: 14.0 (10%, 30% and 50% solutions) % Volatiles by volume @ 21C (70F): No information found. Boiling Point: For 10% solution = 105C (221F); for 30% solution = 115C (239F); for 50% solution = 140C (284F). Melting Point: For 10% solution = -10C (14 F); for 30% solution = 1C (34F); for 50% solution = 12C (53.6F). Vapor Density (Air=1): No information found. Vapor Pressure (mm Hg): 13 @ 60C (140F) (50% solution) Evaporation Rate (BuAc=1): No information found.

10. Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage. Hazardous Decomposition Products: Sodium oxide. Decomposition by reaction with certain metals releases flammable and explosive hydrogen gas. Hazardous Polymerization: Will not occur. Incompatibilities: Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may cause violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry. Conditions to Avoid: Heat, moisture, incompatibles.

11. Toxicological Information

Sodium hydroxide: irritation data: skin, rabbit: 500 mg/24H severe; eye rabbit: 50 ug/24H severe. Investigated as a mutagen. -----\Cancer Lists\ NTP Carcinogen--- Ingredient Known Anticipated IARC Category Sodium Hydroxide (1310-73-2) No No None Water (7732-18-5) No No None

12. Ecological Information

Environmental Fate: No information found. Environmental Toxicity: No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.) Proper Shipping Name: SODIUM HYDROXIDE SOLUTION Hazard Class: 8 UN/NA: UN1824 Packing Group: II Information reported for product/size: 360LB International (Water, I.M.O.) Proper Shipping Name: SODIUM HYDROXIDE, SOLUTION Hazard Class: 8 UN/NA: UN1824 Packing Group: II Information reported for product/size: 360LB

15. Regulatory Information

Chemical Inventory Status - Part 1 Ingredient TSCA EC Japan Australia Sodium Hydroxide (1310-73-2) Yes Yes Yes Yes Water (7732-18-5) Yes Yes Yes Yes Chemical Inventory Status - Part 2 --Canada-- Ingredient Korea DSL NDSL Phil. Sodium Hydroxide (1310-73-2) Yes Yes No Yes Water (7732-18-5) Yes Yes No Yes -----Federal, State & International Regulations - Part 1 \-SARA 302--SARA 313 Ingredient RQ TPQ List Chemical Catg Sodium Hydroxide (1310-73-2) No No No No Water (7732-18-5) No No No Federal, State & International Regulations - Part 2 -RCRA- -TSCA- Ingredient CERCLA 261.33 8(d) Sodium Hydroxide (1310-73-2) 1000 No No Water (7732-18-5) No No No Chemical Weapons Convention: No TSCA 12(b): No CDTA: No SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No Reactivity: Yes (Mixture / Liquid) Australian Hazchem Code: 2R Poison Schedule: S6 WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 1 Label Hazard Warning: POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS. Label Precautions: Do not get in eyes, on skin, or on clothing. Do not breathe mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Label First Aid: If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately. Product Use: Laboratory Reagent. Revision Information: MSDS Section(s) changed since last revision of document include: 8. Disclaimer: Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.