SODIUM HYDROXIDE, DRY SOLID, FLAKE, BEAD, OR GRANULAR
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MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

SUBSTANCE IDENTIFICATION

CAS-NUMBER 1310-73-2
SUBSTANCE: **SODIUM HYDROXIDE, DRY SOLID, FLAKE, BEAD, OR GRANULAR**

TRADE NAMES/SYNONYMS:
CAUSTIC SODA; SODA LYE; LYE; WHITE CAUSTIC; CAUSTIC SODA, BEAD; CAUSTIC SODA, DRY; CAUSTIC SODA, FLAKE; CAUSTIC SODA, GRANULAR; CAUSTIC SODA, SOLID; SODIUM HYDRATE; SODIUM HYDROXIDE (NA(OH)); SODIUM HYDROXIDE, FLAKE; SODIUM HYDROXIDE, DRY; SODIUM HYDROXIDE, SOLID; ASCARITE; SODIUM HYDROXIDE; S318; S613; S320; S612; BP359; UN 1823; STCC 4935235; NAOH; ACC21300

CHEMICAL FAMILY:
INORGANIC BASE

MOLECULAR FORMULA: NA-O-H

MOLECULAR WEIGHT: 40.00

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=1 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=1

COMPONENTS AND CONTAMINANTS

COMPONENT: SODIUM HYDROXIDE PERCENT: 100
CAS# 1310-73-2

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
SODIUM HYDROXIDE:
2 MG/M3 OSHA CEILING
2 MG/M3 ACGIH CEILING
2 MG/M3 NIOSH RECOMMENDED CEILING
2 MG/M3 DFG MAK TWA (TOTAL DUST);
4 MG/M3 DFG MAK 5 MINUTE PEAK, MOMENTARY VALUE, 8 TIMES/SHIFT

MEASUREMENT METHOD: PARTICULATE FILTER; HYDROCHLORIC ACID; TITRATION; (NIOSH VOL. III # 7401, ALKALINE DUSTS).

1000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY

OSHA REVOKED THE FINAL RULE LIMITS OF JANUARY 19, 1989 IN RESPONSE TO THE 11TH CIRCUIT COURT OF APPEALS DECISION (AFL-CIO V. OSHA) EFFECTIVE JUNE 30, 1993. SEE 29 CFR 1910.1000 (58 FR 35338)

PHYSICAL DATA

DESCRIPTION: ODORLESS, WHITE OR OFF-WHITE HYGROSCOPIC SOLID.

BOILING POINT: 2534 F (1390 C) MELTING POINT: 604 F (318 C)

SPECIFIC GRAVITY: 2.130 VAPOR PRESSURE: 100 MMHG @ 1111 C

PH: 14 @ 5% SOLUTION SOLUBILITY IN WATER: 111 %

SOLVENT SOLUBILITY: SOLUBLE IN ALCOHOL, GLYCEROL; INSOLUBLE ACETONE, ETHER.

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

FIREFIGHTING MEDIA:

DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR REGULAR FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. APPLY COOLING WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 60).

USE AGENT SUITABLE FOR TYPE OF FIRE. USE WATER IN FLOODING QUANTITIES AS FOG. APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE.

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49-CFR 172.101:
CORROSIVE MATERIAL

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49-CFR 172.101 AND SUBPART E:
CORROSIVE

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49-CFR 173.245B
EXCEPTIONS: 49-CFR 173.244

FINAL RULE ON HAZARDOUS MATERIALS REGULATIONS (HMR, 49 CFR PARTS 171-180), DOCKET NUMBERS HM-181, HM-181A, HM-181B, HM-181C, HM-181D AND HM-204. EFFECTIVE DATE OCTOBER 1, 1991. HOWEVER, COMPLIANCE WITH THE REGULATIONS IS AUTHORIZED ON AND AFTER JANUARY 1, 1991. (55 FR 52402, 12/21/90)

EXCEPT FOR EXPLOSIVES, INHALATION HAZARDS, AND INFECTIOUS SUBSTANCES, THE EFFECTIVE DATE FOR HAZARD COMMUNICATION REQUIREMENTS IS EXTENDED TO OCTOBER 1, 1993. (56 FR 47158, 09/18/91)

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
SODIUM HYDROXIDE, SOLID-UN 1823

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
8 - CORROSIVE MATERIAL

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:
PG II

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101 AND SUBPART E:
CORROSIVE

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:
EXCEPTIONS: 49 CFR 173.154
NON-BULK PACKAGING: 49 CFR 173.212
BULK PACKAGING: 49 CFR 173.240

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: 15 KG
CARGO AIRCRAFT ONLY: 50 KG

TOXICITY

SODIUM HYDROXIDE:
IRRITATION DATA: 500 MG/24 HOURS SKIN-RABBIT SEVERE; 1% EYE-RABBIT SEVERE; 50 UG/24 HOURS EYE-RABBIT SEVERE; 1 MG/24 HOURS EYE-RABBIT SEVERE; 400 UG EYE-RABBIT MILD; 1 MG/30 SECONDS RINSED EYE-RABBIT SEVERE; 1%/24 HOURS EYE-MONKEY SEVERE.
TOXICITY DATA: 1350 MG/KG SKIN-RABBIT LD50 (VAN WATERS & ROGERS INC. MSDS); 500 MG/KG ORAL-RABBIT LDLO; 104-340 MG/KG ORAL-RAT LD50 (VAN WATERS & ROGERS INC. MSDS); 40 MG/KG INTRAPERITONEAL-MOUSE LD50; MUTAGENIC DATA (RTECS).
CARCINOGEN STATUS: NONE.
LOCAL EFFECTS: CORROSIVE- INHALATION, SKIN, EYE, INGESTION.
ACUTE TOXICITY LEVEL: TOXIC BY INGESTION; MODERATELY TOXIC BY DERMAL ABSORPTION.
TARGET EFFECTS: NO DATA AVAILABLE.
AT INCREASED RISK FROM EXPOSURE: PERSONS WITH PRE-EXISTING SKIN AND EYE CONDITIONS.

HEALTH EFFECTS AND FIRST AID

INHALATION:
SODIUM HYDROXIDE:
CORROSIVE. 250 MG/M3 IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
ACUTE EXPOSURE- EFFECTS DUE TO INHALATION OF DUSTS OR MIST MAY VARY FROM MILD IRRITATION OF THE NOSE AT 2 MG/M3 TO SEVERE PNEUMONITIS DEPENDING ON THE SEVERITY OF EXPOSURE. LOW CONCENTRATIONS MAY CAUSE MUCOUS MEMBRANE IRRITATION WITH SORE THROAT, COUGHING, AND DYSPNEA. INTENSE EXPOSURES MAY RESULT IN DESTRUCTION OF MUCOUS MEMBRANES AND DELAYED PULMONARY EDEMA OR PNEUMONITIS. SHOCK MAY OCCUR.

CHRONIC EXPOSURE- PROLONGED EXPOSURES TO HIGH CONCENTRATIONS OF DUSTS OR MISTS MAY CAUSE DISCOMFORT AND ULCERATION OF THE NASAL PASSAGES. REPEATED EXPOSURES OF 5000 MG/L WERE HARMLESS TO RATS, BUT 10,000 MG/L LED TO NERVOUSNESS, SORE EYES, DIARRHEA AND RETARDED GROWTH. RATS EXPOSED 30 MINUTES/DAY TO UNMEASURED CONCENTRATIONS OF SODIUM HYDROXIDE AEROSOLS SUFFERED PULMONARY DAMAGE AFTER 2-3 MONTHS. DEATH OCCURRED IN 2 OF 10 RATS EXPOSED TO AN AEROSOL OF 40% AQUEOUS SODIUM HYDROXIDE FOR 30 MINUTES, TWICE A WEEK FOR 3 WEEKS. HISTOPATHOLOGICAL EXAMINATION SHOWED MOSTLY NORMAL LUNG TISSUE WITH FOCI OF ENLARGED ALVEOLAR SEPTAE, EMPHYSEMA, BRONCHIAL ULCERATION, AND ENLARGED LYMPH ADENOIDAL TISSUES. AN EPIDEMIOLOGIC STUDY OF 291 WORKERS CHRONICALLY EXPOSED TO CAUSTIC DUSTS FOR 30 YEARS OR MORE FOUND NO SIGNIFICANT INCREASE IN MORTALITY IN RELATION TO DURATION OR INTENSITY OF SUCH EXPOSURES.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
SODIUM HYDROXIDE:
CORROSIVE.
ACUTE EXPOSURE- UPON CONTACT WITH THE SKIN, DAMAGE INCLUDING REDNESS, CUTANEOUS BURNS, SKIN FISSURES AND WHITE ESCHARS MAY OCCUR WITHOUT IMMEDIATE PAIN. EXPOSURE TO SOLUTIONS AS WEAK AS 0.03 N (0.12%) FOR 1 HOUR HAS CAUSED INJURY TO HEALTHY SKIN. SOLUTIONS OF 25-50% CAUSED NO SENSATION OF IRRITATION WITHIN 3 MINUTES IN HUMAN SUBJECTS. WITH SOLUTIONS OF 0.4-4%, IRRITATION DOES NOT OCCUR UNTIL AFTER SEVERAL HOURS. SKIN BIOPSIES FROM HUMAN SUBJECTS HAVING 1 N SODIUM HYDROXIDE APPLIED TO THEIR ARMS FOR 15 TO 180 MINUTES SHOWED PROGRESSIVE CHANGES BEGINNING WITH DISSOLUTION OF THE CELLS IN THE HORNY LAYER AND PROGRESSING THROUGH EDEMA TO TOTAL DESTRUCTION OF THE EPIDERMIS IN 60 MINUTES. A 5% AQUEOUS SOLUTION CAUSED SEVERE NECROSIS TO THE SKIN OF RABBITS WHEN APPLIED FOR 4 HOURS. ALKALIES PENETRATE THE SKIN SLOWLY. THE EXTENT OF INJURY DEPENDS ON THE DURATION OF CONTACT. IF SODIUM HYDROXIDE IS NOT REMOVED FROM THE SKIN, SEVERE BURNS WITH DEEP ULCERATION MAY OCCUR. EXPOSURE TO THE DUST OR MIST MAY CAUSE MULTIPLE SMALL BURNS AND TEMPORARY LOSS OF HAIR. PATHOLOGIC FINDINGS DUE TO ALKALIES MAY INCLUDE GELATINOUS, NECROTIC AREAS AT THE SITE OF CONTACT.
CHRONIC EXPOSURE- EFFECTS ARE DEPENDENT UPON CONCENTRATION AND DURATION OF EXPOSURE. DERMATITIS OR EFFECTS SIMILAR TO THOSE FOR ACUTE EXPOSURE MAY OCCUR.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). IN CASE OF CHEMICAL BURNS, COVER AREA WITH STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
SODIUM HYDROXIDE:
CORROSIVE.
ACUTE EXPOSURE- CONTACT MAY CAUSE 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 WITH OVERGROWTH OF THE CORNEA BY A VASCULARIZED MEMBRANE, PROGRESSIVE OR RECURRENT CORNEAL ULCERATION AND PERMANENT CORNEAL OPACIFICATION. BLINDNESS MAY OCCUR.
CHRONIC EXPOSURE- EFFECTS ARE DEPENDENT UPON CONCENTRATION AND DURATION OF EXPOSURE. CONJUNCTIVITIS OR EFFECTS SIMILAR TO THOSE FOR ACUTE EXPOSURE MAY OCCUR.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). CONTINUE IRRIGATING WITH NORMAL SALINE UNTIL THE PH HAS RETURNED TO NORMAL (30-60 MINUTES). COVER WITH STERILE BANDAGES. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
SODIUM HYDROXIDE:
CORROSIVE/TOXIC.
ACUTE EXPOSURE- THE REPORTED LETHAL DOSE IN RATS IS 140-340 MG/KG. INGESTION MAY CAUSE A BURNING SENSATION IN THE MOUTH, CORROSION OF THE LIPS, MOUTH, TONGUE AND PHARYNX, AND SEVERE ESOPHAGEAL AND ABDOMINAL PAIN, VOMITING OF BLOOD AND LARGE PIECES OF MUCOSA, AND BLOODY DIARRHEA. ASPHYXIA CAN OCCUR FROM SWELLING OF THE THROAT. MEDIASTINITIS, ALKALEMIA, PALLOR, WEAK, SLOW PULSE, CARDIOVASCULAR COLLAPSE, SHOCK, COMA AND DEATH MAY OCCUR. PERFORATION OF THE ALIMENTARY TRACT AND CONSTRICTIVE SCARRING MAY RESULT. ESOPHAGEAL STRICTURE MAY OCCUR WEEKS, MONTHS, OR EVEN YEARS LATER TO MAKE SWALLOWING DIFFICULT. THE ESTIMATED FATAL DOSE IN MAN IS 5 GRAMS. CASES OF SQUAMOUS CELL CARCINOMA OF THE ESOPHAGUS HAVE OCCURRED WITH LATENT PERIODS OF 12 TO 42 YEARS AFTER INGESTION. THESE CANCERS WERE BELIEVED TO BE SEQUELA OF TISSUE DESTRUCTION AND POSSIBLY SCAR FORMATION RATHER THAN THE RESULT OF DIRECT CARCINOGENIC ACTION OF SODIUM HYDROXIDE.
CHRONIC EXPOSURE- DEPENDING ON THE CONCENTRATION, REPEATED INGESTION OF ALKALINE SUBSTANCES MAY RESULT IN INFLAMMATORY AND ULCERATIVE EFFECTS ON

THE ORAL MUCOUS MEMBRANES AND OTHER EFFECTS AS WITH ACUTE INGESTION.

FIRST AID: DO NOT USE GASTRIC LAVAGE OR EMESIS. DILUTE THE ALKALI BY GIVING WATER OR MILK TO DRINK IMMEDIATELY AND ALLOWING VOMITING TO OCCUR. AS SOON AS POSSIBLE, HAVE QUALIFIED MEDICAL PERSONNEL DO ESOPHAGOSCOPY AND IRRIGATE INJURED AREAS WITH 1% ACETIC ACID UNTIL THE ALKALI IS COMPLETELY NEUTRALIZED. (DREISBACH, HANDBOOK OF POISONING, 11TH EDITION). GET MEDICAL ATTENTION IMMEDIATELY.

ANTIDOTE:
NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

REACTIVITY

REACTIVITY:
REACTS EXOTHERMICALLY WITH WATER.

INCOMPATIBILITIES:
SODIUM HYDROXIDE:
ACETALDEHYDE: MAY RESULT IN VIOLENT POLYMERIZATION.
ACETIC ACID: MIXING IN CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
ACETIC ANHYDRIDE: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
ACIDS: MAY REACT VIOLENTLY.
ACROLEIN: MAY RESULT IN AN EXTREMELY VIOLENT POLYMERIZATION.
ACRYLONITRILE: MAY CAUSE VIOLENT POLYMERIZATION.
ALLYL ALCOHOL + BENZENE SULFONYL CHLORIDE: POSSIBLE EXPLOSION HAZARD.
ALLYL CHLORIDE: HYDROLYZES.
ALUMINUM: VIGOROUS REACTION.
ALUMINUM, ARSENIC TRIOXIDE, SODIUM ARSENATE: MAY GENERATE FLAMMABLE HYDROGEN GAS.
AMMONIA + SILVER NITRATE: PRECIPITATION OF EXPLOSIVE SILVER NITRIDE MAY OCCUR.
AMMONIUM SALTS: MAY REACT VIOLENTLY EVOLVING AMMONIA GAS.
BENZENE-1,4-DIOL: EXOTHERMIC REACTION.
N,N'-BIS(TRINITROETHYL)UREA: FORMATION OF EXPLOSIVE COMPOUND.
BROMINE: POSSIBLE EXPLOSION IF NOT STIRRED CONTINOUSLY.
CHLORINE TRIFLUORIDE: MAY CAUSE VIOLENT REACTION.
CHLOROFORM + METHYL ALCOHOL: EXOTHERMIC REACTION.
CHLOROHYDRIN: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
4-CHLORO-2-METHYLPHENOL: POSSIBLE IGNITION.
CHLORONITROTOLUENES: POSSIBLE EXPLOSION.
CHLOROPICRIN: MAY CAUSE VIOLENT REACTION.
CHLOROSULFONIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
CINNAMALDEHYDE: EXOTHERMIC REACTION.
COATINGS: MAY BE ATTACKED.
COPPER: SOLUTIONS MAY SLOWLY CORRODE.
CYANOGEN AZIDE: MAY FORM SODIUM 5-AZIDOTETRAZOLIDE, WHICH IS EXPLOSIVE IF ISOLATED.
2,2-DICHLORO-3,3-DIMETHYLBUTANE: HAZARDOUS REACTION.
1,2-DICHLOROETHYLENE: MAY FORM SPONTANEOUSLY FLAMMABLE MONOCHLOROACETYLENE.
DIBORANE AND OCTANAL OXIME: EXOTHERMIC REACTION.
ETHYLENE CYANOHYDRIN: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
FLAMMABLE LIQUIDS: FIRE AND EXPLOSION HAZARD.
GLYCOLS: MAY CAUSE EXOTHERMIC DECOMPOSITION WITH EVOLUTION OF HYDROGEN GAS.
GLYOXAL: MIXING IN A CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
HALOGENATED HYDROCARBONS: VIOLENT REACTION.
HYDROCHLORIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
HYDROFLUORIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
HYDROQUINONE: RAPID DECOMPOSITION OF HYDROQUINONE WITH EVOLUTION OF HEAT.
IRON: SOLUTIONS MAY SLOWLY CORRODE.
LEAD: MAY BE ATTACKED; FLAMMABLE HYDROGEN GAS MAY BE LIBERATED.
LEATHER: MAY BE ATTACKED.
MALEIC ANHYDRIDE: EXPLOSIVE DECOMPOSITION.
METALS: CORRODES METALS, REACTING TO FORM FLAMMABLE HYDROGEN GAS.
4-METHYL-2-NITROPHENOL: EXOTHERMIC REACTION.
NITRIC ACID: MIXING IN CLOSED CONTAINER INCREASES TEMPERATURE AND PRESSURE.
NITROBENZENE: POSSIBLY EXPLOSIVE REACTION UPON HEATING IN PRESENCE OF WATER.
NITROETHANE: FORMS AN EXPLOSIVE SALT.
NITROMETHANE: FORMS AN EXPLOSIVE SALT.
NITROPARAFFINS: THE NITROPARAFFINS, IN THE PRESENCE OF WATER, FORM DRY SALTS WITH ORGANIC BASES. THE DRY SALTS ARE EXPLOSIVE.
NITROPROPANE: FORMS AN EXPLOSIVE SALT.
O-NITROTOLUENE: POSSIBLE EXPLOSION.
OLEUM: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.
ORGANIC PEROXIDES: INCOMPATIBLE.
PENTOL (3-METHYL-2-PENTENE-4-YN-1-OL): POSSIBLE EXPLOSION.
PHOSPHORUS: MAY FORM MIXED PHOSPHINES WHICH MAY IGNITE SPONTANEOUSLY IN AIR.
PHOSPHORUS PENTOXIDE: MAY REACT VIOLENTLY WHEN HEATED.
PLASTICS: MAY BE ATTACKED.
B-PROPIOLACTONE: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERATURE AND PRESSURE.

PROPYLENE OXIDE: IGNITION OR EXPLOSION MAY OCCUR.
RUBBER: MAY BE ATTACKED.
SODIUM TETRAHYDROBORATE: DRY MIXTURES WITH SODIUM HYDROXIDE CONTAINING 15-40% OF TETRAHYDROBORATE LIBERATE HYDROGEN EXPLOSIVELY AT 230-270 C.
SULFURIC ACID: MIXING IN A CLOSED CONTAINER CAUSES AN INCREASE IN TEMPERAURE AND PRESSURE.
1,2,4,5-TETRACHLOROBENZENE: VIOLENT REACTION.
TETRACHLOROBENZENE + METHYL ALCOHOL: POSSIBLE EXPLOSION.
TETRACHLOROETHYLENE: POSSIBLE EXPLOSION.
TETRAHYDROFURAN: SERIOUS EXPLOSIONS CAN OCCUR.
TIN: EVOLUTION OF HYDROGEN GAS WHICH MAY FORM AN EXPLOSIVE MIXTURE.
1,1,1-TRICHLOROETHANOL: EXPLOSION MAY OCCUR.
TRICHLOROETHYLENE: FORMATION OF EXPLOSIVE MIXTURES OF DICHLOROACETYLENE.
TRICHLORONITROMETHANE + METHANOL: MAY CAUSE VIOLENT REACTION.
WOOL: MAY BE ATTACKED.
ZINC (DUST): FIRE AND EXPLOSION HAZARD.
ZIRCONIUM: MAY CAUSE EXPLOSIVE REACTION UPON HEATING.

DECOMPOSITION:
THERMAL DECOMPOSITION MAY RELEASE TOXIC FUMES OF SODIUM OXIDE.

POLYMERIZATION:
HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE

STORE IN A COOL, DRY, WELL-VENTILATED LOCATION. SEPARATE FROM ACIDS, WATER, METALS. IMMEDIATELY REMOVE AND PROPERLY DISPOSE OF ANY SPILLED MATERIAL. (NFPA 49, HAZARDOUS CHEMICALS DATA, 1991)

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

DISPOSAL

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER D002.
100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

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CONDITIONS TO AVOID

MAY BURN BUT DOES NOT IGNITE READILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. MAY IGNITE COMBUSTIBLES (WOOD, PAPER, OIL, ETC.).

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SPILL AND LEAK PROCEDURES

SOIL SPILL:
DIG HOLDING AREA SUCH AS LAGOON, POND OR PIT FOR CONTAINMENT.

USE PROTECTIVE COVER SUCH AS A PLASTIC SHEET TO PREVENT MATERIAL FROM DISSOLVING IN FIRE EXTINGUISHING WATER OR RAIN.

WATER SPILL:
ADD SUITABLE AGENT TO NEUTRALIZE SPILLED MATERIAL TO PH-7.

OCCUPATIONAL SPILL:
DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. MOVE CONTAINERS FROM SPILL AREA. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 1000 POUNDS
THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:

THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

SODIUM HYDROXIDE:

50 MG/M3- ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST FILTER.
ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.

100 MG/M3- ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.
ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH EFFICIENCY PARTICULATE FILTER.

250 MG/M3- ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH EFFICIENCY PARTICULATE FILTER.
ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

EMERGENCY WASH FACILITIES:
WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES AND/OR SKIN MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN AND QUICK DRENCH SHOWER WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC, INC.
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