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BARIUM NITRATE
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MATERIAL SAFETY DATA SHEET

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SUBSTANCE IDENTIFICATION

SUBSTANCE: **BARIUM NITRATE**

CAS-NUMBER 10022-31-8

TRADE NAMES/SYNONYMS:

BARIUM DINITRATE; NITRIC ACID, BARIUM SALT; NITROBARITE; NITRATE OF BARIUM;
BARIUM(II) NITRATE; BARIUM NITRATE (BA(NO3)2);
NITRIC ACID BARIUM SALT (2:1); STCC 4918709; UN 1446; B-53; BAN206; ACCO2440

CHEMICAL FAMILY:
INORGANIC SALT

MOLECULAR FORMULA: BA-(N-O3)2

MOLECULAR WEIGHT: 261.35

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=0 PERSISTENCE=3
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=0 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: BARIUM NITRATE
CAS# 10022-31-8

PERCENT: 100.0

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

BARIUM, SOLUBLE COMPOUNDS (AS BA):

0.5 MG/M3 OSHA TWA

0.5 MG/M3 ACGIH TWA

0.5 MG/M3 NIOSH RECOMMENDED TWA

0.5 MG/M3 DFG MAK TWA (TOTAL DUST);

1.0 MG/M3 DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: PARTICULATE FILTER; WATER; ATOMIC ABSORPTION
SPECTROMETRY; (NIOSH VOL. III # 7056).

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

PHYSICAL DATA

DESCRIPTION: ODORLESS WHITE SOLID OR COLORLESS LUSTROUS CRYSTALS.

BOILING POINT: DECOMPOSES MELTING POINT: 1098 F (592 C)

SPECIFIC GRAVITY: 3.24 @ 23 C SOLUBILITY IN WATER: SOLUBLE

SOLVENT SOLUBILITY: SLIGHTLY SOLUBLE IN ACIDS; VERY SLIGHTLY SOLUBLE IN
ACETONE; INSOLUBLE IN ALCOHOL.

FIRE AND EXPLOSION DATA

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

OXIDIZER: OXIDIZERS DECOMPOSE, ESPECIALLY WHEN HEATED, TO YIELD OXYGEN OR
OTHER GASES WHICH WILL INCREASE THE BURNING RATE OF COMBUSTIBLE MATTER.
CONTACT WITH EASILY OXIDIZABLE, ORGANIC, OR OTHER COMBUSTIBLE MATERIALS
MAY RESULT IN IGNITION, VIOLENT COMBUSTION OR EXPLOSION.

FIREFIGHTING MEDIA:

WATER ONLY, NO DRY CHEMICAL, CARBON DIOXIDE OR HALON
(1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES, FLOOD AREA WITH WATER FROM A DISTANCE
(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. FOR MASSIVE FIRE IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P5800.5, GUIDE PAGE 42).

FLOOD WITH WATER. COOL AFFECTED CONTAINERS WITH FLOODING AMOUNTS OF WATER; APPLY WATER FROM AS FAR A DISTANCE AS POSSIBLE. IF FIRE IS OUT OF CONTROL, CONSIDER EVACUATION OF 1/2 MILE RADIUS. AVOID BREATHING TOXIC FUMES.

TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49 CFR 172.101:
OXIDIZER

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

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49 CFR 173.182
EXCEPTIONS: 49 CFR 173.153

TOXICITY

BARIUM NITRATE:

IRRITATION DATA: 500 MG/24 HOURS SKIN-RABBIT MILD; 100 MG/24 HOURS EYE-RABBIT MODERATE.

TOXICITY DATA: 355 MG/KG ORAL-RAT LD50; 150 MG/KG ORAL-RABBIT LDLO; 800 MG/KG ORAL-DOG LDLO; 10 MG/KG SUBCUTANEOUS-MOUSE LDLO; 16 MG/KG INTRAVENOUS-MOUSE LD50; 30 MG/KG PARENTERAL-RABBIT LDLO.

CARCINOGEN STATUS: NONE.

LOCAL EFFECTS: IRRITANT- EYES.

ACUTE TOXICITY LEVEL: TOXIC BY INGESTION.

TARGET EFFECTS: POISONING MAY AFFECT THE RESPIRATORY, CENTRAL NERVOUS, AND MUSCULAR SYSTEMS AND KIDNEYS.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH PRE-EXISTING CHRONIC RESPIRATORY, CARDIOVASCULAR, OR SKIN DISEASE.

HEALTH EFFECTS AND FIRST AID

INHALATION:

BARIUM NITRATE:

250 MG(BA)/M3 IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE- INHALATION MAY CAUSE IRRITATION OF THE RESPIRATORY TRACT WITH SORE THROAT, COUGHING, AND LABORED BREATHING. IF SUFFICIENT AMOUNTS ARE ABSORBED, SYMPTOMS MAY RESEMBLE THOSE IN ACUTE INGESTION.
CHRONIC EXPOSURE- NO DATA AVAILABLE.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

BARIUM NITRATE:

ACUTE EXPOSURE- DIRECT CONTACT MAY CAUSE IRRITATION WITH REDNESS AND PAIN. APPLICATION OF 500 MG FOR 24 HOURS TO RABBIT SKIN CAUSED MILD IRRITATION.
CHRONIC EXPOSURE- NO DATA AVAILABLE.

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 (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

BARIUM NITRATE:

IRRITANT:

ACUTE EXPOSURE- DIRECT CONTACT MAY CAUSE IRRITATION WITH REDNESS AND PAIN. APPLICATION OF 100 MG FOR 24 HOURS TO RABBIT EYES CAUSED MODERATE IRRITATION.
CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT WITH IRRITANTS MAY CAUSE CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

BARIUM NITRATE:

TOXIC.

ACUTE EXPOSURE- THE INITIAL EFFECTS FROM SOLUBLE BARIUM COMPOUNDS ARE THOSE

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OF SEVERE GASTROINTESTINAL IRRITATION, INCLUDING NAUSEA, VOMITING AND DIARRHEA WITH OR WITHOUT ABDOMINAL COLIC, AND EXCESSIVE SALIVATION. THERE MAY ALSO BE DRYNESS, A SENSE OF CONSTRICTION OF THE MOUTH AND THROAT, AND A METALLIC TASTE. SYSTEMIC EFFECTS FOLLOW AND MAY INCLUDE RINGING OF THE EARS, DIZZINESS, ELEVATED BLOOD PRESSURE, OCULAR CHANGES CAUSING BLURRED VISION, AND CONVULSIVE TREMORS. HYPOKALEMIA MAY OCCUR AND RESULT IN ABNORMALITIES OF MYOCARDIAL FUNCTION AND IMPAIRED NEUROMUSCULAR FUNCTION, WHICH MAY VARY FROM MINIMAL WEAKNESS TO FRANK PARALYSIS. OTHER EFFECTS MAY INCLUDE ANXIETY, WEAKNESS, AND GRADUALLY INCREASING SLEEPINESS WITH MENTAL CONFUSION. THE CENTRAL NERVOUS SYSTEM MAY BE FIRST STIMULATED AND THEN DEPRESSED. HEMORRHAGES MAY OCCUR IN THE STOMACH, INTESTINES, AND KIDNEYS. KIDNEY DAMAGE AND KIDNEY FAILURE HAVE BEEN DESCRIBED. COLLAPSE AND DEATH FROM RESPIRATORY FAILURE, SEVERE HYPOKALEMIA, AND CARDIAC ARREST MAY OCCUR. RARELY, INORGANIC NITRATES MAY BE CONVERTED TO NITRITES BY NITRATE-REDUCING BACTERIA IN THE DIGESTIVE TRACT, RESULTING IN METHEMOGLOBINEMIA.

CHRONIC EXPOSURE- NO SPECIFIC DATA AVAILABLE. REPEATED OR PROLONGED EXPOSURE TO NITRATES MAY CAUSE ANEMIA, NEPHRITIS AND POSSIBLY METHEMOGLOBINEMIA.

FIRST AID- INDUCE VOMITING IMMEDIATELY WHEN SOLUBLE BARIUM COMPOUNDS ARE INGESTED. TREAT SUPPORTIVELY AND SYMPTOMATICALLY (PARMEGGIANI, ENCYCLOPEDIA OF OCCUPATIONAL HEALTH AND SAFETY, 3RD EDITION). GET MEDICAL ATTENTION IMMEDIATELY.

ANTIDOTE:
THE FOLLOWING ANTIDOTE HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO WHETHER THE SEVERITY OF POISONING REQUIRES ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

POISONING FROM BARIUM COMPOUNDS:
GIVE 30 GRAMS OF SODIUM SULFATE IN 250 ML OF WATER ORALLY AND REPEAT IN ONE HOUR. GIVE BY GASTRIC TUBE IF SYMPTOMS HAVE APPEARED. THE ADMINISTRATION OF SULFATE SALTS INTRAVENOUSLY IS HAZARDOUS, SINCE THEY INDUCE THE PRECIPITATION OF BARIUM SULFATE IN THE KIDNEY, WITH SUBSEQUENT RENAL FAILURE. ADMINISTRATION OF POTASSIUM IS CRITICAL. (DREISBACH, HANDBOOK OF POISONING, 12TH ED.).
ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

REACTIVITY

REACTIVITY:
STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

BARIUM NITRATE:

ALUMINUM-MAGNESIUM ALLOY: FINELY DIVIDED MIXTURES ARE READILY IGNITABLE AND SENSITIVE TO FRICTION OR IMPACT.
ALUMINUM, WATER, POTASSIUM PERCHLORATE AND POTASSIUM NITRATE: MIXTURE EXPLODED AFTER 24 HOURS STORAGE.
BARIUM OXIDE, MAGNESIUM, AND ZINC: MIXTURE EXPLODED FROM AN UNKNOWN CAUSE IN ONE CASE.
COMBUSTIBLE MATERIALS: MAY INCREASE THE BURNING RATE. FINELY DIVIDED MATERIAL MAY IGNITE OR EXPLODE ON CONTACT.
REDUCING MATERIALS: MAY CAUSE IGNITION OR EXPLOSION OF FINELY DIVIDED MATERIALS. MAY INCREASE THE RATE OF BURNING MATERIALS.
SEE ALSO METAL NITRATES.

METAL NITRATES:

CITRIC ACID: POSSIBLE EXPLOSION HAZARD.
ESTERS: POSSIBLE EXPLOSION HAZARD.
PHOSPHINATES: MAY EXPLODE WHEN HEATED.
PHOSPHOROUS: POSSIBLE EXPLOSIVE REACTION.
POTASSIUM HEXANITROCOBALTATE(3-): MAY EXPLODE VIOLENTLY.
REDUCTANTS: POSSIBLE EXPLOSION HAZARD.
TIN(II) CHLORIDE: POSSIBLE EXPLOSIVE HAZARD.

DECOMPOSITION:

THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF NITROGEN AND BARIUM.

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. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

STORAGE

PROTECT AGAINST PHYSICAL DAMAGE. SEPARATE FROM COMBUSTIBLE, ORGANIC OR OTHER EASILY OXIDIZABLE MATERIALS. AVOID STORAGE ON WOOD FLOORS. IMMEDIATELY REMOVE AND DISPOSE OF ANY SPILLED NITRATE (NFPA 49, HAZARDOUS CHEMICAL DATA, 1975).

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CONSULT NFPA PUBLICATION 43A, STORAGE OF LIQUID AND SOLID OXIDIZING MATERIALS, FOR STORAGE REQUIREMENTS.

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 D001.
100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

BARIUM - REGULATORY LEVEL: 100.0 MG/L
MATERIALS WHICH CONTAIN THE ABOVE SUBSTANCE AT OR ABOVE THE REGULATORY LEVEL MEET THE EPA CHARACTERISTIC OF TOXICITY, AND MUST BE DISPOSED OF IN ACCORDANCE WITH 40 CFR PART 262. EPA HAZARDOUS WASTE NUMBER D005.

CONDITIONS TO AVOID

AVOID CONTACT WITH OTHER COMBUSTIBLE MATERIALS (WOOD, PAPER, OIL, ETC.). AVOID CONTACT WITH EYES AND SKIN; MATERIAL MAY BE POISONOUS OR CORROSIVE.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
KEEP COMBUSTIBLES (WOOD, PAPER, OIL, ETC.) AWAY FROM SPILLED MATERIAL. DO NOT TOUCH SPILLED MATERIAL. 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.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION 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).

BARIUM, SOLUBLE COMPOUNDS (AS BA):

- 5 MG/M3- ANY DUST AND MIST RESPIRATOR EXCEPT SINGLE-USE AND QUARTER-MASK RESPIRATORS.
ANY SUPPLIED AIR RESPIRATOR.
ANY SELF-CONTAINED BREATHING APPARATUS.
 - 12.5 MG/M3- ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST FILTER.
ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.
 - 25 MG/M3- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER.
ANY POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND A HIGH EFFICIENCY PARTICULATE FILTER.
ANY SUPPLIED-AIR RESPIRATOR WITH A TIGHT-FITTING FACEPIECE OPERATED IN A CONTINUOUS FLOW MODE.
ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.
 - 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:

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EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED 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 TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

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

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