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FERRIC NITRATE, NONAHYDRATE
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MATERIAL SAFETY DATA SHEET

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SUBSTANCE IDENTIFICATION

SUBSTANCE: **FERRIC NITRATE, NONAHYDRATE**
CAS-NUMBER 7782-61-8
TRADE NAMES/SYNONYMS:
IRON(III) NITRATE, NONAHYDRATE; NITRIC ACID, IRON (3+) SALT, NONAHYDRATE;
I110; UN 1466; ACC09780

CHEMICAL FAMILY:
INORGANIC SALT

MOLECULAR FORMULA: N3-09-FE.9H2-0

MOLECULAR WEIGHT: 404.02

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

COMPONENTS AND CONTAMINANTS

COMPONENT: FERRIC NITRATE, NONAHYDRATE
CAS# 7782-61-8 PERCENT: >99

OTHER CONTAMINANTS: CL, SO4, INSOLUBLE MATTER

EXPOSURE LIMITS:
IRON SALTS, SOLUBLE, AS FE:
1 MG/M3 OSHA TWA
1 MG/M3 ACGIH TWA

PHYSICAL DATA

DESCRIPTION: PALE-VIOLET TO GRAYISH-WHITE, SOMEWHAT DELIQUESCENT, CRYSTALS

BOILING POINT: 257 F (125 C) MELTING POINT: 117 F (47 C)

SPECIFIC GRAVITY: 1.684 SOLUBILITY IN WATER: SOLUBLE

SOLVENT SOLUBILITY: ALCOHOL, ACETONE; SLIGHTLY SOLUBLE IN CONC NITRIC ACID

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 EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT. FOR MASSIVE FIRE IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES; IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 35).

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FLOOD WITH WATER. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING VAPORS OR DUSTS. EVACUATE TO A RADIUS OF 2500 FEET FOR UNCONTROLLABLE FIRES.

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

FERRIC NITRATE:
ANHYDROUS: MUTAGENIC DATA (RTECS).
NONAHYDRATE: 3250 MG/KG ORAL-RAT LD50.
CARCINOGEN STATUS: NONE.
LOCAL EFFECTS: CORROSIVE- SKIN, EYES, AND INGESTION.
ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INGESTION.
TARGET EFFECTS: POISONING BY SOLUBLE IRON SALTS MAY AFFECT THE CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM, AND LIVER.

HEALTH EFFECTS AND FIRST AID

INHALATION:
FERRIC NITRATE:
ACUTE EXPOSURE- INHALATION OF DUSTS OR MISTS OF SOLUBLE IRON SALTS
MAY BE IRRITATING TO THE RESPIRATORY TRACT.
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:
FERRIC NITRATE:
CORROSIVE.
ACUTE EXPOSURE- CONTACT WITH SOLUBLE IRON SALTS MAY CAUSE SEVERE IRRITATION AND BURNS.
CHRONIC EXPOSURE- EFFECTS DEPEND ON CONCENTRATION AND DURATION OF EXPOSURE. REPEATED OR PROLONGED CONTACT WITH CORROSIVE SUBSTANCES MAY RESULT IN DERMATITIS OR EFFECTS SIMILAR TO ACUTE EXPOSURE.

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:
FERRIC NITRATE:
CORROSIVE.
ACUTE EXPOSURE- CONTACT WITH THE EYES BY SOLUBLE IRON SALTS MAY CAUSE SEVERE IRRITATION AND BURNS; A LOCAL BROWN DISCOLORATION MAY ALSO OCCUR.
CHRONIC EXPOSURE- EFFECTS DEPEND ON CONCENTRATION AND DURATION OF EXPOSURE. REPEATED OR PROLONGED CONTACT WITH CORROSIVE SUBSTANCES MAY RESULT IN CONJUNCTIVITIS OR EFFECTS AS IN ACUTE EXPOSURE.

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:
FERRIC NITRATE:
CORROSIVE.
ACUTE EXPOSURE- 10 MINUTES TO SEVERAL HOURS AFTER EXCESSIVE INGESTION OF SOLUBLE IRON SALTS, SEVERE GASTRITIS OR GASTROENTERITIS MAY DEVELOP

WITH ABDOMINAL PAIN, NAUSEA, VOMITING OR HEMATEMESIS, WATERY OR TAI
DIARRHEA FROM CORROSION OF THE GASTRIC MUCOSA, DEHYDRATION, LEUKOCY
AND FEVER, METALLIC TASTE, RESTLESSNESS, LETHARGY, HYPOTONIA, COMA,
PALLOR OR CYANOSIS, FAST, WEAK PULSE, HYPOTENSION, HYPERVENTILATION
DUE TO ACIDOSIS, SHOCK, VASOMOTOR INSTABILITY, AND CARDIOVASUCLAR
COLLAPSE MAY OCCUR. SEVERE CASES MAY LEAD TO DEATH IN 4 TO 6
HOURS. AFTER AN ASYMPTOMATIC PERIOD OF 12 TO 72 HOURS, SYMPTOMS OF
THE INITIAL STAGE MAY RECUR. PNEUMONITIS, PULMONARY EDEMA AND
HEMORRHAGE, AND CONVULSIONS MAY ALSO BE PRESENT. LIVER IMPAIRMENT
WITH JAUNDICE, HYPOGLYCEMIA, MULTIPLE COAGULATION DEFECTS, KIDNEY DAMAGE
WITH ANURIA, PANCREATIC DAMAGE, VASCULAR DAMAGE, HYPOVOLEMIA,
HEMOCONCENTRATION, PROFOUND SHOCK AND VASCULAR COLLAPSE MAY DEVELOP. AT
THIS STAGE, DEATH MAY OCCUR IN ONE TO THREE DAYS OR UP TO A WEEK AFTER
INGESTION, FROM SHOCK, HEPATIC FAILURE, OR PNEUMONIA. SURVIVORS MAY
DISPLAY GASTRIC SCARRING OR OBSTRUCTION, PYLORIC OBSTRUCTION OR

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STENOSIS, MILD HEPATIC CIRRHOSIS, AND, IN AT LEAST ONE REPORTED INSTANCE, NEUROLOGIC SEQUELAE. RARELY, INORGANIC NITRATES MAY BE CONVERTED TO NITRITES BY NITRATE-REDUCING BACTERIA IN THE DIGESTIVE TRACT, RESULTING IN METHEMOGLOBINEMIA.
CHRONIC EXPOSURE-CHRONIC EXCESSIVE IRON INTAKE CAN LEAD TO HEMOSIDEROSIS WITH POSSIBLE DAMAGE TO THE LIVER AND PANCREAS. REPEATED OR PROLONGED EXPOSURE TO NITRATES MAY CAUSE ANEMIA, NEPHRITIS, AND POSSIBLY METHEMOGLOBINEMIA.

FIRST AID- IN PATIENTS NOT IN SHOCK OR COMA, INDUCE EMESIS WITH SYRUP OF IPECAC IF VOMITING HAS NOT OCCURRED. FOLLOW WITH GASTRIC LAVAGE USING DEFEROXAMINE, 2 GRAMS IN 1 LITER OF WATER CONTAINING SODIUM BICARBONATE, 20 GM/L. LEAVE 10 GRAMS OF DEFEROXAMINE IN 50 ML OF 5% SODIUM BICARBONATE IN THE STOMACH, MAINTAIN AIRWAY, BLOOD PRESSURE AND RESPIRATION. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.) GET MEDICAL ATTENTION IMMEDIATELY. TREATMENT SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

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.

IRON SALT POISONING:
GIVE DEFEROXAMINE, 15 MG/KG/HOUR BY CONTINUOUS INTRAVENOUS INFUSION TO A MAXIMUM OF 80 MG/KG IN EACH 12-HOUR PERIOD. MONITOR THE BLOOD PRESSURE DURING ADMINISTRATION OF DEFEROXAMINE AND REDUCE THE RATE OF ADMINISTRATION IF THE BLOOD PRESSURE FALLS. SINGLE DOSES SHOULD NOT EXCEED 1 GRAM AND THE MAXIMUM IN 24 HOURS SHOULD NOT EXCEED 6 GRAMS. DEFEROXAMINE IS HAZARDOUS IN PATIENTS WITH SEVERE RENAL DISEASE OR ANURIA, AND DIALYSIS IS NECESSARY. INJECTED DEFEROXAMINE IS ASSOCIATED WITH A HIGH RISK AND SHOULD BE RESERVED FOR SERIOUS POISONING. CONTINUE DEFEROXAMINE THERAPY UNTIL THE PATIENT IS FREE OF SYMPTOMS AND SIGNS FOR 24 HOURS (DREISBACH, HANDBOOK OF POISONING, 11TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

REACTIVITY

REACTIVITY:
STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

FERRIC NITRATE:
COMBUSTIBLE MATERIALS: MAY INCREASE THE BURNING RATE. FINELY DIVIDED MATERIALS MAY IGNITE OR EXPLODE.
DIMETHYL SULFOXIDE: FORMS EXPLOSIVE MIXTURE.
ORGANIC MATERIALS: MAY INCREASE THE BURNING RATE. FINELY DIVIDED MATERIALS MAY IGNITE OR EXPLODE.
REDUCING AGENTS: MAY INCREASE THE BURNING RATE. FINELY DIVIDED MATERIALS MAY IGNITE OR EXPLODE ON CONTACT.
SEE ALSO METAL NITRATES.

DECOMPOSITION:
THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF NITROGEN.

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

CONDITIONS TO AVOID

AVOID CONTACT WITH COMBUSTIBLE MATERIALS (WOOD, PAPER, FUEL, OILS, ETC);
IGNITION OR EXPLOSION MAY RESULT. AVOID CONTAMINATION OF WATER SOURCES.

SPILL AND LEAK PROCEDURES

SOIL SPILL:
DIG A HOLDING AREA SUCH AS PIT, POND OR LAGOON TO CONTAIN SPILLED MATERIAL.
USE PROTECTIVE COVER SUCH AS A PLASTIC SHEET TO PREVENT DISSOLVING IN FIREFIGHTING WATER OR RAIN.

WATER SPILL:

NEUTRALIZE WITH AGRICULTURAL LIME, SLAKED LIME, CRUSHED LIMESTONE, OR SODIUM BICARBONATE.

ADD SUITABLE AGENT TO NEUTRALIZE SPILLED MATERIAL TO PH-7.

USE MECHANICAL DREDGES OR LIFTS TO EXTRACT IMMOBILIZED MASSES OF POLLUTION AND PRECIPITATES.

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 SMALL LIQUID SPILLS, TAKE UP WITH SAND, EARTH OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY.

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ISOLATE HAZARD AREA AND DENY ENTRY.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST VENTILATION AND/OR GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:
THE FOLLOWING RESPIRATORS ARE RECOMMENDED BASED ON INFORMATION FOUND IN THE PHYSICAL DATA, TOXICITY AND HEALTH EFFECTS SECTIONS. THEY ARE RANKED IN ORDER FROM MINIMUM TO MAXIMUM RESPIRATORY PROTECTION.
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST BE BASED ON THE SPECIFIC OPERATION, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND MUST BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

ANY DUST AND MIST RESPIRATOR WITH A FULL FACEPIECE.

ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER.

ANY POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND HIGH-EFFICIENCY PARTICULATE FILTER.

ANY TYPE 'C' SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE OR WITH A FULL FACEPIECE, HELMET OR HOOD OPERATED IN CONTINUOUS-FLOW MODE.

ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

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

ANY SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN 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.

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