IRON OXIDE

FERRIC-FERROUS OXIDE
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MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
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(201) 796-7100

EMERGENCY CONTACTS:
GASTON L. PILLORI: (201) 796-7100
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(201) 796-7523
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SUBSTANCE IDENTIFICATION

CAS-NUMBER 1317-61-9

SUBSTANCE: **FERRIC-FERROUS OXIDE**

TRADE NAMES/SYNONYMS:
BLACK IRON OXIDE; IRON OXIDE BLACK; MAGNETIC IRON OXIDE; MAGNETITE; FERRIFERROUS OXIDE; FERROSOFERRIC OXIDE; ETHIOPS IRON; TRIIRON TETRAOXIDE; TRIIRON TETROXIDE; IRON FERRITE; IRON OXIDE; I-119;

CHEMICAL FAMILY:
METAL OXIDE

MOLECULAR FORMULA: FE3-O4 OR FE-O.FE2-O3

MOLECULAR WEIGHT: 231.55

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

COMPONENTS AND CONTAMINANTS

COMPONENT: FERRIC-FERROUS OXIDE PERCENT: 100

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
NONE ESTABLISHED FOR FERRIC-FERROUS OXIDE (IRON OXIDE):
FOR IRON OXIDE FUME:
10 MG/M3 OSHA TWA
5 MG/M3 ACGIH TWA

PHYSICAL DATA

DESCRIPTION: FINE, REDISH OR BLUISH BLACK POWDER OR BLACK CUBES WITH A

METALLIC TASTE. MELTING POINT: 2800 F (1538 C) SPECIFIC GRAVITY: 5.18

SOLUBILITY IN WATER: INSOLUBLE

SOLVENT SOLUBILITY: SOLUBLE IN SULFURIC ACID, HYDROCHLORIC ACID; SLIGHTLY SOLUBLE IN NITRIC ACID; INSOLUBLE IN ALCOHOL, ETHER

FIRE AND EXPLOSION DATA

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

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY OR STANDARD FOAM (1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR STANDARD FOAM (1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).

FIREFIGHTING:
NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.

TOXICITY

FERRIC-FERROUS OXIDE (IRON OXIDE):
CARCINOGEN STATUS: NONE.
THE TOXICITY OF FERRIC-FERROUS OXIDE HAS NOT BEEN QUANTIFIED. CHRONIC EXPOSURE MAY AFFECT THE LUNGS.

HEALTH EFFECTS AND FIRST AID

INHALATION:
FERRIC-FERROS OXIDE (IRON OXIDE):

ACUTE EXPOSURE- INHALATION OF FRESHLY FORMED IRON OXIDE FUMES MAY RESULT IN METAL FUME FEVER. POISONING MAY CAUSE MUSCULAR ACHES AND FEVER WITH COUGH, DYSPNEA, SENSE OF LASSITUDE AND MALAISE, SOMETIMES NAUSEA, AND RARELY, VOMITING. FEVER AND CHILLS MAY BE FOLLOWED BY SWEATING AND PROSTRATION. THESE EFFECTS USUALLY SUBSIDE IN SEVERAL HOURS.
CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE TO IRON OXIDE, USUALLY FOR LONGER THAN 10 YEARS, CAN CAUSE A BENIGN PNEUMOCONIOSIS CALLED SIDEROSIS. THE EXPOSED PERSON DOES NOT BECOME ILL, BUT THE BENIGN PNEUMOCONIOSIS MAY CAUSE X-RAY SHADOWS THAT CAN BE INDISTINGUISHABLE FROM FIBROTIC PNEUMOCONIOSIS.

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-FERROUS OXIDE (IRON OXIDE):
ACUTE EXPOSURE- NO DATA AVAILABLE. CONTACT MAY CAUSE 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:
FERRIC-FERROUS OXIDE (IRON OXIDE):
ACUTE EXPOSURE- NO SPECIFIC DATA AVAILABLE. PARTICLES OF IRON OR IRON COMPOUNDS WHICH BECOME IMBEDDED IN THE EYE MAY CAUSE SIDEROSIS WITH VARIED EFFECTS. SOME PARTICLES MAY CAUSE NO SIGNIFICANT TOXIC EFFECTS, EVEN OVER MANY YEARS. DISCOLORING OF THE IRIS TO YELLOWISH GREEN OR BROWN IS THE EARLIEST AND MOST COMMON SIGN OF SIDEROSIS. THE ACTIVITY OF THE PUPIL IS COMMONLY AFFECTED, AND IF THE PARTICLE HAS ENTERED THE LENS, IT GENERALLY BECOMES CATARACTOUS. IN SOME CASES THERE MAY BE SEVERE INJURY TO THE RETINA AND IT MAY EVENTUALLY BE DETACHED OR DESTROYED. THERE MAY BE A BLINDNESS. GLAUCOMA MAY RARELY BE A COMPLICATION.
CHRONIC EXPOSURE- NO DATA AVAILABLE.

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-FERROUS OXIDE (IRON OXIDE):
ACUTE EXPOSURE- NO DATA AVAILABLE.
CHRONIC EXPOSURE- NO DATA AVAILABLE.

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-FERROUS OXIDE (IRON OXIDE):
ALUMINUM POWDER: WITH SMALL AMOUNTS OF CALCIUM FLUORIDE, CALCIUM SILICIDE, AND SODIUM NITRATE EXPLOSION OCCURS.
ALUMINUM + SULFUR: VIOLENT REACTION.
HYDROGEN TRISULFIDE: WITH FERRIC-FERROUS OXIDE, STANNIC OXIDE, AND LEAD OXIDE VIOLENT REACTION OCCURS.

DECOMPOSITION:
THERMAL DECOMPOSITION MAY RELEASE TOXIC AND/OR HAZARDOUS GASES.

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

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

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CONDITIONS TO AVOID

NONE REPORTED.

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SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
NO SPECIAL PRECAUTIONS INDICATED.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON THE 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.
THE FOLLOWING RESPIRATORS ARE RECOMMENDED BASED ON THE DATA FOUND IN THE PHYSICAL DATA, HEALTH EFFECTS AND TOXICITY SECTIONS. THEY ARE RANKED IN ORDER FROM MINIMUM TO MAXIMUM RESPIRATORY PROTECTION:

DUST, MIST, AND FUME RESPIRATOR.

POWERED AIR-PURIFYING RESPIRATOR WITH A DUST, MIST, AND FUME FILTER.

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.

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

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

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

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 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. CONTACT LENSES SHOULD NOT BE WORN.

AUTHORIZED - FISHER SCIENTIFIC GROUP, INC.
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-ADDITIONAL INFORMATION-