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\*\*MANGANESE CHLORIDE\*\*  
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MATERIAL SAFETY DATA SHEET

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SUBSTANCE IDENTIFICATION

CAS-NUMBER 7773-01-5  
SUBSTANCE: \*\*MANGANESE CHLORIDE\*\*

TRADE NAMES/SYNONYMS:  
MANGANESE CHLORIDE (MNCL<sub>2</sub>); MANGANESE DICHLORIDE; MANGANESE(II) CHLORIDE;  
MANGANOUS CHLORIDE; M87; SCACCHITE; MANGANESE BICHLORIDE; CL<sub>2</sub>MN; ACC13600

CHEMICAL FAMILY:  
INORGANIC SALT

MOLECULAR FORMULA: MN-CL<sub>2</sub>

MOLECULAR WEIGHT: 125.84

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

COMPONENTS AND CONTAMINANTS

COMPONENT: MANGANESE CHLORIDE PERCENT: 100.0  
CAS# 7773-01-5

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:  
MANGANESE COMPOUNDS (AS MN):  
5 MG/M<sup>3</sup> OSHA CEILING  
5 MG/M<sup>3</sup> ACGIH TWA  
(NOTICE OF INTENDED CHANGES 1992-93)  
1 MG/M<sup>3</sup> NIOSH RECOMMENDED TWA; 3 MG/M<sup>3</sup> NIOSH RECOMMENDED STEL  
5 MG/M<sup>3</sup> DFG MAK TWA (TOTAL DUST);  
50 MG/M<sup>3</sup> DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 1 TIME/SHIFT

MEASUREMENT METHOD: PARTICULATE FILTER; ACID; INDUCTIVELY COUPLED PLASMA;  
(NIOSH VOL. III # 7300, ELEMENTS).

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

PHYSICAL DATA

DESCRIPTION: REDDISH, SLIGHTLY DELIQUESCENT CRYSTALS.

BOILING POINT: 2174 F (1190 C) MELTING POINT: 1202 F (650 C)

SPECIFIC GRAVITY: 2.977 @ 25 C SOLUBILITY IN WATER: 72%

SOLVENT SOLUBILITY: SOLUBLE IN ALCOHOL; INSOLUBLE IN ETHER AND AMMONIA.

FIRE AND EXPLOSION DATA

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

FLASH POINT: NON-FLAMMABLE

FIREFIGHTING MEDIA:  
EXTINGUISH USING AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE.

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

TOXICITY

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MANGANESE CHLORIDE:  
TOXICITY DATA:  
ANHYDROUS: 1715 MG/KG ORAL-MOUSE LD50; 202 MG/KG INTRAVENOUS-DOG LD50; 64800  
UG/KG INTRAVENOUS-RABBIT LDLO; 210 MG/KG SUBCUTANEOUS-MOUSE LDLO; 180  
MG/KG SUBCUTANEOUS-GUINEA PIG LDLO; 180 MG/KG SUBCUTANEOUS-RABBIT LDLO;  
700 MG/KG INTRAMUSCULAR-RAT LD50; 255 MG/KG INTRAMUSCULAR-MOUSE LD50; 121  
MG/KG INTRAPERITONEAL-MOUSE LD50; 56 MG/KG PARENTERAL-DOG LDLO; 18 MG/KG  
PARENTERAL-RABBIT LDLO; 4 MG/KG UNREPORTED-CAT LDLO; 600 UG/KG  
UNREPORTED-DOG LDLO; 60 MG/KG UNREPORTED-GUINEA PIG LDLO; 6500 UG/KG  
UNREPORTED-RABBIT LDLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA  
(RTECS); TUMORIGENIC DATA (RTECS).  
DIHYDRATE: MUTAGENIC DATA (RTECS).  
TETRAHYDRATE: 1484 MG/KG ORAL-RAT LD50; 138 MG/KG INTRAPERITONEAL-RAT LD50;  
144 MG/KG INTRAPERITONEAL-MOUSE LD50; 225 MG/KG PARENTERAL-RAT LD50;  
REPRODUCTIVE EFFECTS DATA (RTECS).  
CARCINOGEN STATUS: NONE  
ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INGESTION (ANHYDROUS, TETRAHYDRATE).  
TARGET EFFECTS: NEUROTOXIN; POISONING MAY ALSO AFFECT THE RESPIRATORY  
SYSTEM.\*  
AT INCREASED RISK FROM EXPOSURE; PERSONS WITH A HISTORY OF ALCOHOLISM,  
PSYCHIATRIC, NEUROLOGIC, OR PULMONARY DISEASES, LIVER DYSFUNCTION, OR  
ANEMIA.\*

\* MAY BE BASED ON GENERAL INFORMATION ON MANGANESE COMPOUNDS.

HEALTH EFFECTS AND FIRST AID

INHALATION:  
MANGANESE CHLORIDE:  
SEE INFORMATION ON MANGANESE COMPOUNDS.

MANGANESE COMPOUNDS:  
NEUROTOXIN.

ACUTE EXPOSURE- NO DATA AVAILABLE.  
CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE TO MANGANESE COMPOUNDS  
MAY RESULT IN SYSTEMIC POISONING KNOWN AS "MANGANISM", A PARKINSONIAN-LIKE  
SYNDROME. IT IS CHARACTERIZED INITIALLY BY ANOREXIA, ASTHENIA, HEADACHE,  
INSOMNIA OR SOMNOLENCE, IRRITABILITY, RESTLESSNESS, AND SPASM OR PAIN IN  
THE MUSCLES. MANGANESE PSYCHOSIS MAY FOLLOW WITH UNCONTROLLABLE BEHAVIOR,  
UNCONTROLLABLE LAUGHING OR CRYING, VISUAL HALLUCINATIONS, CONFUSION AND  
EUPHORIA. SEXUAL EXCITEMENT FOLLOWED BY IMPOTENCE MAY OCCUR. THESE  
SYMPTOMS MAY DISAPPEAR WITH THE ONSET OF TRUE NEUROLOGICAL MANIFESTATIONS  
OF SLOW, SLURRED AND IRREGULAR SPEECH, MONOTONOUS TONE, DOUBLE VISION,  
IMPAIRED HEARING, DIFFICULTY WITH FINE MOTOR MOVEMENTS, AND DISTURBANCES  
IN GAIT AND BALANCE WITH FREQUENT PROPULSION OR RETROPULSION. MASK-LIKE  
FACE, DECREASED MOVEMENT OF THE EYELIDS AND EYES AND TREMORS OF THE UPPER  
EXTREMITIES AND HEAD MAY ALSO OCCUR. OTHER SIGNS AND SYMPTOMS MAY INCLUDE  
URINARY BLADDER DISTURBANCES, EXCESSIVE SALIVATION AND SWEATING,  
HEMATOLOGICAL CHANGES, VASOMOTOR DISORDERS, DECREASED PULMONARY FUNCTION,  
KIDNEY AND POSSIBLY LIVER DAMAGE. REMOVAL FROM EXPOSURE SHORTLY AFTER  
ONSET OF SYMPTOMS USUALLY RESULTS IN IMPROVEMENT, ALTHOUGH THERE MAY  
BE RESIDUAL DISTURBANCES IN GAIT AND SPEECH. ONCE MANGANISM IS WELL  
ESTABLISHED IT BECOMES IRREVERSIBLE AND PROGRESSIVE, BUT NOT FATAL.  
AN INCREASED INCIDENCE OF BRONCHITIS AND PNEUMONITIS HAS BEEN REPORTED  
IN STUDIES OF WORKERS EXPOSED TO MANGANESE DUST AND FUME, AND ALTHOUGH  
THESE EFFECTS HAVE BEEN CONFIRMED BY ANIMAL EXPERIMENTS, THEY MAY  
REPRESENT AN AGGRAVATION OF A PRE-EXISTING CONDITION. ALLERGIC  
DISEASES OF THE RESPIRATORY TRACT HAVE ALSO BEEN REPORTED IN ONE STUDY.

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:  
MANGANESE CHLORIDE:  
SEE INFORMATION ON MANGANESE COMPOUNDS.

MANGANESE COMPOUNDS:  
ACUTE EXPOSURE- SOME MANGANESE COMPOUNDS MAY BE IRRITATING TO THE SKIN.  
CHRONIC EXPOSURE- SENSITIZATION HAS BEEN REPORTED IN GUINEA PIGS.

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:  
MANGANESE CHLORIDE:  
SEE INFORMATION ON MANGANESE COMPOUNDS.

MANGANESE COMPOUNDS:  
ACUTE EXPOSURE- DIRECT CONTACT WITH MANGANESE COMPOUNDS MAY CAUSE  
IRRITATION.  
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:

MANGANESE CHLORIDE:

THE LETHAL DOSE REPORTED IN MICE WAS 1715 MG/KG. THE SYMPTOMS WERE NOT REPORTED. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS. SEE INFORMATION ON MANGANESE COMPOUNDS.

MANGANESE COMPOUNDS:

ACUTE EXPOSURE- EXTREMELY LARGE DOSES OF MANGANESE COMPOUNDS MAY CAUSE GASTROINTESTINAL IRRITATION AND POSSIBLY SYSTEMIC TOXICITY. CHRONIC EXPOSURE- MANGANESE POISONING HAS BEEN REPORTED IN PERSONS DRINKING MANGANESE-CONTAMINATED WELL WATER.

FIRST AID- IF VICTIM IS CONSCIOUS, IMMEDIATELY GIVE 2 TO 4 GLASSES OF WATER, AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. 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.

MANGANESE POISONING:

CALCIUM EDETATE IS EFFECTIVE IN REMOVING MANGANESE, BUT HAS NO PERMANENT EFFECT ON SYMPTOMATIC PATIENTS IN THE LATE STAGES OF MANGANISM. THE ADMINISTRATION OF CALCIUM DISODIUM EDETATE IS RECOMMENDED. EDETATE IS AVAILABLE AS 5 ML AMPULES OF 20% SOLUTION. GIVE 15-25 MG/KG (0.08-0.125 ML OF 20% SOLUTION PER KILOGRAM BODY WEIGHT) IN 250-500 ML OF 5% DEXTROSE INTRAVENOUSLY OVER A 1 TO 2 HOUR PERIOD TWICE DAILY. THE MAXIMUM DOSE SHOULD NOT EXCEED 50 MG/KG/DAY. THE DRUG SHOULD BE GIVEN IN 5-DAY COURSES WITH A REST PERIOD OF AT LEAST 2 DAYS BETWEEN COURSES. AFTER THE FIRST COURSE, SUBSEQUENT COURSES SHOULD NOT EXCEED 50 MG/KG/DAY. DAILY URINALYSES SHOULD BE DONE DURING THE TREATMENT PERIOD. THE DOSAGE SHOULD BE REDUCED IF ANY UNUSUAL URINARY FINDINGS APPEAR. INTRAVENOUS ADMINISTRATION IS CONTRAINDICATED IN THE PRESENCE OF ELEVATED CEREBROSPINAL FLUID PRESSURE. FOR INTRAMUSCULAR ADMINISTRATION, GIVE 20% SOLUTION (200 MG/ML), 12.5 MG/KG BODY WEIGHT EVERY 4-6 HOURS. DILUTE EACH DOSE WITH AN EQUAL VOLUME OF 1% PROCAINE. DOSE LIMITATION IS THE SAME AS THAT GIVEN ABOVE (DREISBACH, HANDBOOK OF POISONING, 11TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

MANGANESE CHLORIDE:

POTASSIUM: EXPLOSIVE ON IMPACT. SODIUM: EXPLOSIVE ON IMPACT. ZINC: EXPLOSIVE REACTION WHEN HEATED.

DECOMPOSITION:

THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC AND CORROSIVE FUMES OF CHLORINE.

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 AWAY FROM INCOMPATIBLE SUBSTANCES.

STORE IN TIGHTLY CLOSED CONTAINERS; PREVENT EXPOSURE TO MOISTURE.

\*\*\*\*\*  
CONDITIONS TO AVOID

NO REPORTS FOUND.

\*\*\*\*\*  
SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:

SWEEP UP AND PLACE IN SUITABLE CLEAN, DRY CONTAINERS FOR RECLAMATION OR LATER DISPOSAL. DO NOT FLUSH SPILLED MATERIAL INTO SEWER. KEEP UNNECESSARY PEOPLE AWAY.

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).

MANGANESE AND COMPOUNDS (AS MN):

- 10 MG/M3- ANY DUST AND MIST RESPIRATOR EXCEPT SINGLE-USE AND QUARTER-MASK RESPIRATORS.  
ANY SUPPLIED-AIR RESPIRATOR.  
ANY SELF-CONTAINED BREATHING APPARATUS.
- 25 MG/M3- ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST FILTER (IF NOT PRESENT AS A FUME).  
ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.
- 50 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 SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.  
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.  
ANY SUPPLIED-AIR RESPIRATOR WITH A TIGHT-FITTING FACEPIECE OPERATED IN A CONTINUOUS FLOW MODE.
- 1000 MG/M3- ANY SUPPLIED-AIR RESPIRATOR WITH A HALF-MASK AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.
- 2000 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:

PROTECTIVE CLOTHING NOT REQUIRED. AVOID REPEATED OR PROLONGED CONTACT WITH THIS SUBSTANCE.

GLOVES:

PROTECTIVE GLOVES ARE NOT REQUIRED BUT RECOMMENDED.

EYE PROTECTION:

EYE PROTECTION NOT REQUIRED, BUT ADVISABLE.

AUTHORIZED - FISHER SCIENTIFIC, INC.  
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