



chemists helping chemists in research & industry

aldrich chemical co., inc.

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P O BOX 296
WHITEWATER WI 53190-0296

DATE: 05/06/94
CUST#: 523216
PO#: UND-435595

M A T E R I A L S A F E T Y D A T A S H E E T PAGE 1

SECTION 1. - - - - - CHEMICAL IDENTIFICATION - - - - -

PRODUCT #: 29513-2 NAME: CHLORINE, 99.5+%

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - -

CAS #: 7782-50-5
MF: CL2

SYNONYMS

BERTHOLITE * CHLOOR (DUTCH) * CHLOR (GERMAN) * CHLORE (FRENCH) *
CHLORINE (ACGIH, DOT, OSHA) * CHLORINE MOL. * CLORO (ITALIAN) *
MOLECULAR CHLORINE * UN1017 (DOT) *

SECTION 3. - - - - - HAZARDS IDENTIFICATION - - - - -

LABEL PRECAUTIONARY STATEMENTS

OXIDIZING
HIGHLY TOXIC (USA DEFINITION)
TOXIC (EUROPEAN DEFINITION)
CONTACT WITH COMBUSTIBLE MATERIAL MAY CAUSE FIRE.
CAUSES BURNS.
TOXIC BY INHALATION.
DANGER: POISONOUS, CORROSIVE AND OXIDIZING GAS UNDER PRESSURE.
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF
WATER AND SEEK MEDICAL ADVICE.
IN CASE OF INSUFFICIENT VENTILATION, WEAR SUITABLE
RESPIRATORY EQUIPMENT.
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE
PROTECTION.
CYLINDER TEMPERATURE SHOULD NOT EXCEED 125 F (52 C).
DO NOT PUNCTURE OR INCINERATE THIS CYLINDER.

SECTION 4. - - - - - FIRST-AID MEASURES - - - - -

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
CLOTHING AND SHOES.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.

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M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 2

CUST#: 523216
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PRODUCT #: 295132 NAME: CHLORINE, 99.5+%
MF: CL2

KEEP UNDER MEDICAL OBSERVATION.

SECTION 5. - - - - - FIRE FIGHTING MEASURES - - - - -

EXTINGUISHING MEDIA
USE WATER SPRAY OR FOG NOZZLE TO KEEP CYLINDER COOL. MOVE CYLINDER AWAY FROM FIRE IF THERE IS NO RISK.

SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
DANGER: POISONOUS, CORROSIVE AND OXIDIZING GAS UNDER PRESSURE.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS
SUPPORTS COMBUSTION.
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.

SECTION 6. - - - - - ACCIDENTAL RELEASE MEASURES - - - - -

EVACUATE AREA AND KEEP PERSONNEL UPWIND.
WEAR FULL PROTECTIVE EQUIPMENT SUCH AS, A BUTYL RUBBER CHEMICAL-PROOF AIR SUIT, WITH BREATHING AIR SUPPLIED.
SHUT OFF LEAK IF THERE IS NO RISK.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - HANDLING AND STORAGE - - - - -

REFER TO SECTION 8.

ADDITIONAL INFORMATION

THE CLEAVAGE OF DINITROANILINES TO CHLORONITRODIAZONIUM SALTS BY HYDROCHLORIC ACID IS CATALYZED BY CHLORINE. THE REACTION TAKES PLACE VIGOROUSLY WITH COPIOUS GAS EVOLUTION, BUT BELOW 40 C THERE CAN BE A LONG INDUCTION PERIOD BEFORE THE ONSET OF THE VIGOROUS REACTION. CHLORINATION OF 4,4'-DITHIODIMORPHOLINE OR BIS(2,4-DINITROPHENYL) DISULFIDE FOLLOWED BY EVAPORATION OF SOLVENT LED TO EXPLOSIONS. REACTION WITH AZIRIDINE GIVES N-CHLORDAZIRIDINE AN EXPLOSIVE COMPOUND. A MIXTURE OF BROMINE PENTAFLUORIDE AND CHLORINE EXPLODE WHEN HEATED. AN EXOTHERMIC RUNAWAY REACTION OCCURRED WITH TRIMETHYL THIONOPHOSPHATE AND CHLORINE RESULTING IN AN EXPLOSION. SATURATED

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PAGE 3

CUST #: 523216
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PRODUCT #: 295132 NAME: CHLORINE, 99.5+%
MF: CL2

SOLUTIONS OF CHLORINE IN DIMETHYLFORMAMIDE (DMF) ARE HAZARDOUS. THEY WILL SELF-HEAT AND ERUPT UNDER EITHER ADIABATIC OR NON-ADIABATIC CONDITIONS. VIOLENT REACTION OCCURRED ON MIXING CHLORINE WITH 20% SODIUM HYDROXIDE OR ARYLIMIDOSULFINAMIDES. EXPLOSIONS BETWEEN CHLORINE WITH: DIOXYGEN DIFLUORIDE, OXYGEN DIFLUORIDE, FLUORINE, TETRASELENIUM TETRANITRIDE, SYNTHETIC RUBBER, HYDROGEN, VANADIUM POWDER, CARBON DISULFIDE AND IRON, 3-CHLOROPROPYNE, ANTIMONY TRICHLORIDE AND TETRAMETHYLSILANE AT 100 C, AQUEOUS SULFAMIC ACID, DICHLORO(METHYL)ARSINE, DISILYL OXIDE, AMMONIA, DIBORANE, STIBINE, WHITE PHOSPHOROUS, ETHYLPHOSPHINE HAVE BEEN REPORTED. CHLORINE IGNITES ON CONTACT WITH THE FOLLOWING: ETHER, DIETHYL ZINC, MONO AND DI-ALKALI METAL ACETYLIDES, COPPER ACETYLIDES, CARBIDES OF IRON, URANIUM AND ZIRCONIUM, HYDRIDES OF POTASSIUM, SODIUM AND COPPER, TRIALKYL BORANES, TUNGSTEN DIOXIDE, MERCURIC SULFIDE, ARSENIC DISULFIDE, BORON TRISULFIDE, TRIMAGNESIUM DIPHOSPHIDE, TRIMANGANESE DIPHOSPHIDE, BORON PHOSPHIDE, ALUMINUM, ARSENIC, ANTIMONY, BORON, BISMUTH, BRASS FOIL, CALCIUM POWDER, COPPER, ACTIVATED CARBON, IRON WIRE, GERMANIUM, MAGNESIUM, MANGANESE, NICKEL, MERCURY, NIOBIUM, POTASSIUM, SILICON, SODIUM, SULFUR, TELLURIUM, THORIUM, TIN, TITANIUM, URANIUM, ZINC, ALUMINUM-TITANIUM ALLOYS, ARSINE, PHOSPHINE, SILANE, PHOSPHOROUS TRIOXIDE, BORON DIIODOPHOSPHIDE OR TRIMERCURY TETRAPHOSPHIDE.

SECTION 8. - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION - - - - -

CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR IN NONVENTILATED AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV.
USE ONLY IN A CHEMICAL FUME HOOD.
SAFETY SHOWER AND EYE BATH.
DO NOT BREATHE GAS.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
HIGHLY TOXIC.
CORROSIVE.
KEEP TIGHTLY CLOSED.
CYLINDER TEMPERATURE SHOULD NOT EXCEED 125 F (52 C).
STORE AND USE WITH ADEQUATE VENTILATION.

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M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 4

PRODUCT #: 295132
MF: CL2

NAME: CHLORINE, 99.5+%

CUST#: 523216
PO#: UND-435595

CONTENTS UNDER PRESSURE.
WARNING: SUCK-BACK INTO CYLINDER MAY CAUSE RUPTURE.
USE BACK-FLOW-PREVENTIVE DEVICE IN PIPING.
USE WITH EQUIPMENT RATED FOR CYLINDER PRESSURE, AND OF COMPATIBLE MATERIALS OF CONSTRUCTION. CLOSE VALVE WHEN NOT IN USE AND WHEN EMPTY.
MAKE SURE CYLINDER IS PROPERLY SECURED WHEN IN USE OR STORED.

SECTION 9. - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - -

APPEARANCE AND ODOR

GREENISH-YELLOW GAS
BOILING POINT: -34 C
MELTING POINT: -101 C
VAPOR PRESSURE: 4800MM 20 C 7000MM 21.1 C
VAPOR DENSITY: 2.48

SECTION 10. - - - - - STABILITY AND REACTIVITY - - - - -

INCOMPATIBILITIES

ALCOHOLS
STORE AWAY FROM HEAT AND DIRECT SUNLIGHT.
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
HYDROGEN CHLORIDE GAS

SECTION 11. - - - - - TOXICOLOGICAL INFORMATION - - - - -

ACUTE EFFECTS

MAY BE FATAL IF INHALED.
MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
INHALATION MAY BE FATAL AS A RESULT OF SPASM, INFLAMMATION AND EDEMA OF THE LARYNX AND BRONCHI, CHEMICAL PNEUMONITIS AND PULMONARY EDEMA.
SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING, WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND VOMITING.

RTECS NO: F02100000
CHLORINE
TOXICITY DATA

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PAGE 5

CUST#: 523216
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PRODUCT #: 295132 NAME: CHLORINE, 99.5+%

MF: CL2

IHL-HMN LCLO:2530 MG/M3/30M
IHL-HMN LCLO:500 PPM/5M
IHL-RAT LC50:293 PPM/1H
IHL-MUS LC50:137 PPM/1H

28ZDAH -,150,37
TABIA2 3,231,33
AMRL** TR-72-62,72
AMRL** TR-72-62,72

TARGET ORGAN DATA

BEHAVIORAL (MUSCLE WEAKNESS)
LUNGS, THORAX OR RESPIRATION (DYSPPNAE)
GASTROINTESTINAL (NAUSEA OR VOMITING)
EFFECTS ON NEWBORN (BIOCHEMICAL AND METABOLIC)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR
COMPLETE INFORMATION.

SECTION 12. ----- ECOLOGICAL INFORMATION -----
DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----
CAUTION: NO-RETURN CYLINDER. DO NOT REUSE. EMPTY CYLINDER WILL CONTAIN
HAZARDOUS RESIDUE. FOLLOW PROPER DISPOSAL TECHNIQUES.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----
CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

REVIEWS, STANDARDS, AND REGULATIONS

ACGIH TLV-TWA 0.5 PPM; STEL 1 PPM 85INA8 5,117.1(87),86
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
FEREAC 54,7740,89
MSHA STANDARD-AIR:TWA 1 PPM (3 MG/M3)
DTLVS* 3,46,71
OSHA PEL:CL 1 PPM (3 MG/M3)
FEREAC 54,2923,89
OSHA PEL FINAL:8H TWA 0.5 PPM (1.5 MG/M3); STEL 1 PPM (3 MG/M3)
FEREAC 54,2923,89

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PAGE 6

CUST#: 523216
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PRODUCT #: 295132 NAME: CHLORINE, 99.5+%
MF: CL2

DEL-ARAB REPUBLIC OF EGYPT:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-AUSTRALIA:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-AUSTRIA:TWA 0.5 PPM (1.5 MG/M3) JANUARY 1993
DEL-BELGIUM:TWA 0.5 PPM (1.5 MG/M3);STEL 1 PPM (3 MG/M3) JANUARY 1993
DEL-CZECHOSLOVAKIA:TWA 3 MG/M3;STEL 6 MG/M3 JANUARY 1993
DEL-DENMARK:TWA 0.5 PPM (1.5 MG/M3) JANUARY 1993
DEL-FINLAND:TWA 0.5 PPM (1.5 MG/M3);STEL 1 PPM (3 MG/M3) JANUARY 1993
DEL-FRANCE:STEL 1 PPM (3 MG/M3) JANUARY 1993
DEL-GERMANY:TWA 0.5 PPM (1.5 MG/M3) JANUARY 1993
DEL-HUNGARY:STEL 1 MG/M3 JANUARY 1993
DEL-INDIA:TWA 1 PPM (3 MG/M3);STEL 3 PPM (9 MG/M3) JANUARY 1993
DEL-JAPAN:TWA 1 PPM (2.9 MG/M3) JANUARY 1993
DEL-THE NETHERLANDS:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-THE PHILIPPINES:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-POLAND:TWA 1.5 MG/M3 JANUARY 1993
DEL-RUSSIA:TWA 1 PPM;STEL 1 MG/M3 JANUARY 1993
DEL-SWEDEN:TWA 0.5 PPM (1.5 MG/M3);STEL 1 PPM (3 MG/M3) JANUARY 1993
DEL-SWITZERLAND:TWA 0.5 PPM (1.5 MG/M3);STEL 1 PPM (3 MG/M3) JANUARY 1993
DEL-THAILAND:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-TURKEY:TWA 1 PPM (3 MG/M3) JANUARY 1993
DEL-UNITED KINGDOM:TWA 1 PPM (3 MG/M3);STEL 3 PPM (9 MG/M3) JANUARY 1993
DEL IN BULGARIA, COLOMBIA, JORDAN, KOREA, NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACCIHL TLV
NIOSH REL TO CHLORINE-AIR:10H TWA 0.5 PPM;STEL 1 PPM
NIOSH* DHHS #92-100,92
NIOSH 1974: HZD 18040; NIS 169; TNF 21429; NOS 86; TNE 220544
NIOSH 1983: HZD X9656; NIS 3; TNF 338; NOS 6; TNE 4768; TFE 1862
EPA TSCA CHEMICAL INVENTORY, JUNE 1993
EPA TSCA SECTION 8(E) STATUS REPORT
8EHQ-1182-0466;8EHQ-1279-0322;8EHQ-1279-0329
EPA TSCA SECTION 8(E) STATUS REPORT 8EHQ-0578-0146;8EHQ-0678-0183
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, SEPTEMBER 1993
NIOSH ANALYTICAL METHODS: SEE BROMINE AND CHLORIDE 6011
NTP CARCINOGENESIS STUDIES (DRINKING);EQUIVOCAL EVIDENCE:RAT
NTPTR* NTP-TR-392,92
NTP CARCINOGENESIS STUDIES (DRINKING);NO EVIDENCE:MOUSE
NTPTR* NTP-TR-392,92
OSHA ANALYTICAL METHOD #ID-101

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PRODUCT #: 295132 NAME: CHLORINE, 99.5+%
MF: CL2

CUST#: 523216
PO#: UND-435595

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

SECTION 16. - - - - - OTHER INFORMATION - - - - -

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