SIGMA CHEMICAL COMPANY  
POST OFFICE BOX 14508  
SAINT LOUIS, MISSOURI 63178, USA

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PURCHASING OFFICE  
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WHITEWATER WI 53190-1705

EMERGENCY PHONE 1-314-771-5765  
DATE 05/27/97

CUST#: 2-097-94816  
PO#: VISA 05/23/97

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--- --- --- --- ---

CATALOG #: H7020  
NAME: HYDROCHLORIC ACID ACS REAGENT

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

CAS #: 7647-01-0  
MF: HCL  
EC NO: 231-595-7

SYNONYMS  
ACIDE CHLORHYDRIQUE (FRENCH) * ACIDO CLORIDRICO (ITALIAN) * ANHYDROUS  
HYDROCHLORIC ACID * CHLOORWATERSTOF (DUTCH) * CHLORHYDRIC ACID *  
CHLOROWODOR (POLISH) * CHLORWASSERSTOFF (GERMAN) * HYDROCHLORIC ACID,  
SOLUTION (UN1789) (DOT) * HYDROCHLORIDE * HYDROGEN CHLORIDE (AGI:  
OSHA) * HYDROGEN CHLORIDE, ANHYDROUS (UN1050) (DOT) * HYDROGEN  
CHLORIDE, REFRIGERATED LIQUID (UN2186) (DOT) * MURIATIC ACID *  
SPIRITS OF SALT * UN1050 (DOT) * UN1789 (DOT) * UN2186 (DOT) *

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

LABEL PRECAUTIONARY STATEMENTS  
CORROSIVE  
CAUSES BURNS.  
REACTS VIOLENTLY WITH WATER.  
POISON  
MAY DEVELOP PRESSURE.  
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF  
WATER AND SEEK MEDICAL ADVICE.  
TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING.  
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE  
PROTECTION.  
DO NOT BREATHE VAPOR.

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.  
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS  
WITH FINGERS.  
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 IMMEDIATELY.  
WASH CONTAMINATED CLOTHING BEFORE REUSE.  
DISCARD CONTAMINATED SHOES.

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

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CATALOG #: H7020  
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EXTINGUISHING MEDIA  
NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.  

SPECIAL FIREFIGHTING PROCEDURES  
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.  

UNUSUAL FIRE AND EXPLOSIONS HAZARDS  
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.  

SECTION 6. ACCIDENTAL RELEASE MEASURES  
EVACUATE AREA. WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES. COVER WITH DRY-LIME, SAND, OR SODA ASH. PLACE IN COVERED CONTAINERS USING NON-SPARKING TOOLS AND TRANSPORT OUTDOORS. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.  

SECTION 7. HANDLING AND STORAGE  
REFER TO SECTION 8.  

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION  
CHEMICAL SAFETY GOGGLES. SAFETY SHOWER AND EYE BATH. FACE SHIELD (8-INCH MINIMUM). NIOSH/MSHA-APPROVED RESPIRATOR IN NONVENTILATED AREAS AND/OR FOR EXPOSURE ABOVE THE ACGIH TLV. MECHANICAL EXHAUST REQUIRED. RUBBER GLOVES. AVOID BREATHING VAPOR. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID PROLONGED OR REPEATED EXPOSURE. WASH THOROUGHLY AFTER HANDLING. CORROSIVE. POISON. KEEP TIGHTLY CLOSED. MAY DEVELOP PRESSURE. REACTS VIOLENTLY WITH WATER. STORE IN A COOL DRY PLACE.  

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES  
APPEARANCE AND ODOR: CLEAR COLORLESS LIQUID  

PHYSICAL PROPERTIES  
CONTINUED ON NEXT PAGE
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MATERIAL SAFETY DATA SHEET PAGE 3

CATALOG #: H7020
NAME: HYDROCHLORIC ACID ACS REAGENT

FLASHPOINT: NONE
VAPOR PRESSURE: 3.23 PSI at 21.1 C 7.93 PSI at 37.7 C
SPECIFIC GRAVITY: 1.200
VAPOR DENSITY: 1.3

SECTION 10. STABILITY AND REACTIVITY

INCOMPATIBILITIES
BASES
AMINES
ALKALI METALS
COPPER, COPPER ALLOYS
ALUMINUM
CORRODES STEEL
DO NOT ALLOW WATER TO ENTER CONTAINER BECAUSE OF VIOLENT REACTION.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
HYDROGEN CHLORIDE GAS

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS
MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN.
CAUSES BURNS.
MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES
AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
INHALATION MAY RESULT IN 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 #: MW4025000
HYDROCHLORIC ACID

IRRITATION DATA
EYE-RBT 5 MG/30S RINSE MLD

TXCYAC 23, 281, 82

TOXICITY DATA
IHL-HMN LCL0: 1300 PPM/30M
IHL-HMN LCL0: 3000 PPM/5M
UNR-MAN LDLo: 81 MG/KG
IHL-RAT LC50: 3224 PPM/1H
IHL-MUS LC50: 1108 PPM/1H
IPR-MUS LD50: 40142 MG/KG
ORE-RBT LD50: 900 MG/KG

TOXICITY DATA

29ZWA-1, 207, 68
TABIA2 3, 231, 33
85DCA-1, 73, 70
AMRL** TR-74-78, 74
JCTODH 3, 61, 76
COREAF 256, 1043, 63
BIZEA2 134, 437, 23

TARGET ORGAN DATA
SENSE ORGANS AND SPECIAL SENSES (OTHER EYE EFFECTS)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY STIMULATION)
SKIN AND APPENDAGES (AFTER SYSTEMIC EXPOSURE: DERMATITIS, OTHER)

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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 - - - - - - -
FOR SMALL QUANTITIES: CAUTIOUSLY ADD TO A LARGE STIRRED EXCESS OF WATER. ADJUST THE pH TO NEUTRAL, SEPARATE ANY INSOLUBLE SOLIDS OR LIQUIDS AND PACKAGE THEM FOR HAZARDOUS-WASTE DISPOSAL. FLUSH THE AQUEOUS SOLUTION DOWN THE DRAIN WITH PLENTY OF WATER. THE HYDROLYSIS AND NEUTRALIZATION REACTIONS MAY GENERATE HEAT AND FUMES WHICH CAN BE CONTROLLED BY THE RATE OF ADDITION.

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

SECTION 15. - - - - - - - REGULATORY INFORMATION - - - - - - -
EUROPEAN INFORMATION
EC INDEX NO: 017-002-00-2
CORROSIVE
R 34
CAUSES BURNS.
R 37
IRRITATING TO RESPIRATORY SYSTEM.
S 26
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
S 45
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

REVIEWS, STANDARDS, AND REGULATIONS
OEL-MAK
ACGIH TLV-CL 7.5 MG/M3 (5 PPM) DTLVS* TLV/BEI 96
IARC CANCER REVIEW: HUMAN INADEQUATE EVIDENCE IMEMDT 54;189.92
IARC CANCER REVIEW: ANIMAL INADEQUATE EVIDENCE IMEMDT 54;189.92
IARC CANCER REVIEW: GROUP 3 IMEMDT 54;189.92
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
FERAC 54;7740.89
MSHA STANDARD: AIR-CL 5 PPM (7 MG/M3) DTLVS* 3;129.71
OSHA PEL (GEN'INDU): CL 5 PPM (7 MG/M3) CFRGBR 29;1910.1000.94
OSHA PEL (CONSTRUC): CL 5 PPM (7 MG/M3)

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OSHA PEL (SHIYARD): CL 5 PPM (7 MG/M3)
OSHA PEL (FED CONT): CL 5 PPM (7 MG/M3)
AFLIN-REG: 1.50-204 50.94
AFLIN-AUS TRALIA: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-AUSTRIA: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-BELGIUM: STEL 5 PPM (7.7 MG/M3) JAN93
AFLIN-DENMARK: STEL 5 PPM (7 MG/M3) JAN93
AFLIN-FINLAND: STEL 5 PPM (7 MG/M3) SKIN JAN93
AFLIN-FRANCE: STEL 5 PPM (7.5 MG/M3) JAN93
AFLIN-GERMANY: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-HUNGARY: STEL 5 PPM (7 MG/M3) JAN93
AFLIN-JAPAN: STEL 5 PPM (7.5 MG/M3) JAN93
AFLIN-THAILAND: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-THE PHILIPPINES: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-UNITED STATES: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-SWITZERLAND: TWA 5 PPM (7.5 MG/M3); STEL 10 PPM (15 MG/M3) JAN93
AFLIN-THAILAND: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-TURKEY: TWA 5 PPM (7 MG/M3) JAN93
AFLIN-UNITED STATES: TWA 5 PPM (7 MG/M3) STEL 5 PPM (7 MG/M3) JAN93
AFLIN-IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV
AFLIN IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO HYDROGEN CHLORIDE-AIR: CL 5 PPM
NIOSH* DHHS #92-100.92
NOHS 1974: HZD 385680; NIS 360; TNE 87434; NOS 156; TNE 24875
NOHS 1983: HZD 385680; NIS 321; TNE 60309; NOS 183; TNE 1238572; TFE 3881308
EPA GENETOX PROGRAM 1988, NEGATIVE: CELL TRANSFORM.-SA7/SHE
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
EPA TSCA SECTION 8(E) RISK NOTIFICATION, 8EHQ-0892-9246
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 1997
NIOSH ANALYTICAL METHOD, 1994: ACIDS, INORGANIC, 7903

U.S. INFORMATION
THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

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MATERIAL SAFETY DATA SHEET

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