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THE WORLD'S FOREMOST MANUFACTURER OF RESEARCH
BIOCHEMICALS AND DIAGNOSTIC REAGENTS

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UNIVERSITY OF WISCONSIN
WHITEWATER
ACCOUNTS PAYABLE
PO BOX 296
WHITEWATER WI 53190-0296

EMERGENCY PHONE 1-314-771-5765

DATE 06/04/96
CUST#: 2-097-94804
PO#: UNF-64248

MATERIAL SAFETY DATA SHEET PAGE 1

THIS MSDS IS FOR A COMPONENT OF CATALOG #: 505-2

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #:
NAME: HYDROCHLORIC ACID REAGENT

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

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

SYNONYMS

ACIDE CHLORHYDRIQUE (FRENCH) \* ACIDO CLORIDRICO (ITALIAN) \* ANHYDROUS
HYDROCHLORIC ACID \* CHLOORWATERSTOF (DUTCH) \* CHLOROHYDRIC ACID \*
CHLOROWODOR (POLISH) \* CHLORWASSERSTOFF (GERMAN) \* HYDROCHLORIC ACID,
SOLUTION (UN1789) (DOT) \* HYDROCHLORIDE \* HYDROGEN CHLORIDE (ACGIH:
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.
MAY DEVELOP PRESSURE.
POISON
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

CONTINUED ON NEXT PAGE

BRANCH OFFICES AT:

Table listing branch offices for SIGMA-ALDRICH in various countries including USA, Europe, and Asia.



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MATERIAL SAFETY DATA SHEET PAGE 2

THIS MSDS IS FOR A COMPONENT OF CATALOG #: 505-2

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NAME: HYDROCHLORIC ACID REAGENT

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.
FACESHIELD (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
COLORLESS LIQUID

PHYSICAL PROPERTIES

CONTINUED ON NEXT PAGE

RANCH OFFICES AT:

Table listing regional offices for SIGMA-ALDRICH in various countries including USA, Canada, Europe, and Asia.

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MATERIAL SAFETY DATA SHEET PAGE 3

THIS MSDS IS FOR A COMPONENT OF CATALOG #: 505-2

CATALOG #: HYDROCHLORIC ACID REAGENT  
NAME:

FLASHPOINT NONE  
VAPOR PRESSURE: 3.23PSI 21.1 C 7.93PSI 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 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 #: MW4025000  
HYDROCHLORIC ACID

IRRITATION DATA

EYE-RBT 5 MG/30S RINSE MLD TXCYAC 23,281,82

TOXICITY DATA

IHL-HMN LCLO:1300 PPM/30M	29ZWAE - ,207,68
IHL-HMN LCLO:3000 PPM/5M	TABIA2 3,231,33
UNR-MAN LDLO:81 MG/KG	85DCAI 2,73,70
IHL-RAT LC50:3124 PPM/1H	AMRL** TR-74-78,74
IHL-MUS LC50:1108 PPM/1H	JCTODH 3,61,76
IPR-MUS LD50:1449 MG/KG	COREAF 256,1043,63
ORL-RBT LD50:900 MG/KG	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)

CONTINUED ON NEXT PAGE

BRANCH OFFICES AT:

SIGMA-ALDRICH /ERTRIEBS GmbH Innvieler Weg 30 3041 Dissenhofen /austschland	SIGMA-ALDRICH QUIMICA, S.A. SIGMA-ALDRICH s.r.o. Apt. Correas 181 28100 Alcobendas (Madrid) Espana	Kizikova 27 186 00 Praha 8 Ceská Republika	SIGMA CHEMIE K. Cardijnplein, 8 B-2890 Bornem België/Belgique	SIGMA CHEMIE P.O. Box 260 CH-9470 Buchs Switzerland	SIGMA-ALDRICH QUIMICA, S.A. de C.V. Avenida Picocho Ajusco No. 130-303 Fraccionamiento Jardines en la Montaña 14210 Mexico, D.F.	SIGMA-ALDRICH CORPORATION New Delhi Location B-4/158, Safdarjung Enclave New Delhi - 110 029 India
SIGMA CHIMIE ISLE D'Abau Chesnes I.P. 701 3297 St. Quentin Fallavier /adex /rance	SIGMA-ALDRICH S.r.l Via Gallarate 154 20151 Milano Italia	SIGMA-ALDRICH PTY., LIMITED Unit 2, 10 Anella Ave. Castle Hill NSW 2154 Australia	SIGMA-ALDRICH CHEMICAL REPRESENTACÕES LTDA. Rua Sabará, 566 - Conj. 53 01289-010 São Paulo, SP Brasil	SIGMA CHEMICAL CO. LTD. Fancy Road, Poole Dorset BH17 7NH England	SIGMA-ALDRICH Kft Teréz krt. 39 1067 Budapest Hungary	SIGMA-ALDRICH 206 Samhan Campus Building 17-3 Yoido-dong Yungdeungpo-ku Seoul South Korea



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MATERIAL SAFETY DATA SHEET PAGE 4

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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.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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 14

REACTS VIOLENTLY WITH WATER.

S 26

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF
WATER AND SEEK MEDICAL ADVICE.

S 27

TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING.

S 36/37/39

WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE
PROTECTION.

S 23

DO NOT BREATHE VAPOR.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK

ACGIH TLV-CL 5 PPM

IARC CANCER REVIEW:HUMAN INADEQUATE EVIDENCE

IARC CANCER REVIEW:ANIMAL INADEQUATE EVIDENCE

IARC CANCER REVIEW:GROUP 3

EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION

FEREAC 54,7740,89

MSHA STANDARD:AIR-CL 5 PPM (7 MG/M3)

85INAS 6,773,91
IMEMDT 54,189,92
IMEMDT 54,189,92
IMEMDT 54,189,92

CONTINUED ON NEXT PAGE

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Table listing branch offices for SIGMA-ALDRICH in various countries including Germany, Spain, Italy, Austria, Brazil, Belgium, Switzerland, Mexico, India, and South Korea.



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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 5

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CATALOG #:
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DTLVS\* 3,129,71
OSHA PEL (GEN INDU):CL 5 PPM (7 MG/M3)
CERGBR 29,1910.1000,94
OSHA PEL (CONSTRUC):CL 5 PPM (7 MG/M3)
CERGBR 29,1926.55,94
OSHA PEL (SHIPYARD):CL 5 PPM (7 MG/M3)
CERGBR 29,1915.1000,93
OSHA PEL (FED CONT):CL 5 PPM (7 MG/M3)
CERGBR 41,50-204.50,94
OEL-AUSTRALIA:TWA 5 PPM (7 MG/M3) JAN93
OEL-AUSTRIA:TWA 5 PPM (7 MG/M3) JAN93
OEL-BELGIUM:STEL 5 PPM (7.7 MG/M3) JAN93
OEL-DENMARK:STEL 5 PPM (7 MG/M3) JAN93
OEL-FINLAND:STEL 5 PPM (7 MG/M3);SKIN JAN93
OEL-FRANCE:STEL 5 PPM (7.5 MG/M3) JAN93
OEL-GERMANY:TWA 5 PPM (7 MG/M3) JAN93
OEL-HUNGARY:STEL 5 MG/M3 JAN93
OEL-JAPAN:STEL 5 PPM (7.5 MG/M3) JAN93
OEL-THE NETHERLANDS:TWA 5 PPM (7 MG/M3) JAN93
OEL-THE PHILIPPINES:TWA 5 PPM (7 MG/M3) JAN93
OEL-POLAND:TWA 5 MG/M3 JAN93
OEL-RUSSIA:STEL 5 PPM (5 MG/M3) JAN93
OEL-SWEDEN:STEL 5 PPM (8 MG/M3) JAN93
OEL-SWITZERLAND:TWA 5 PPM (7.5 MG/M3);STEL 10 PPM (15 MG/M3) JAN93
OEL-THAILAND:TWA 5 PPM (7 MG/M3) JAN93
OEL-TURKEY:TWA 5 PPM (7 MG/M3) JAN93
OEL-UNITED KINGDOM:TWA 5 PPM (7 MG/M3);STEL 5 PPM (7 MG/M3) JAN93
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV
OEL 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 38580; NIS 360; TNF 87434; NOS 156; TNE 824985
NOES 1983: HZD 38580; NIS 321; TNF 60309; NOS 183; TNE 1238572; TFE 388130
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, OCTOBER 1995
NIOSH ANALYTICAL METHOD, 1994: ACIDS, INORGANIC, 7903

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

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

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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New Delhi Location
SIGMA-ALDRICH PTY., LIMITED SIGMA-ALDRICH CHEMICAL SIGMA CHEMICAL CO. LTD. SIGMA-ALDRICH KR SIGMA-ALDRICH



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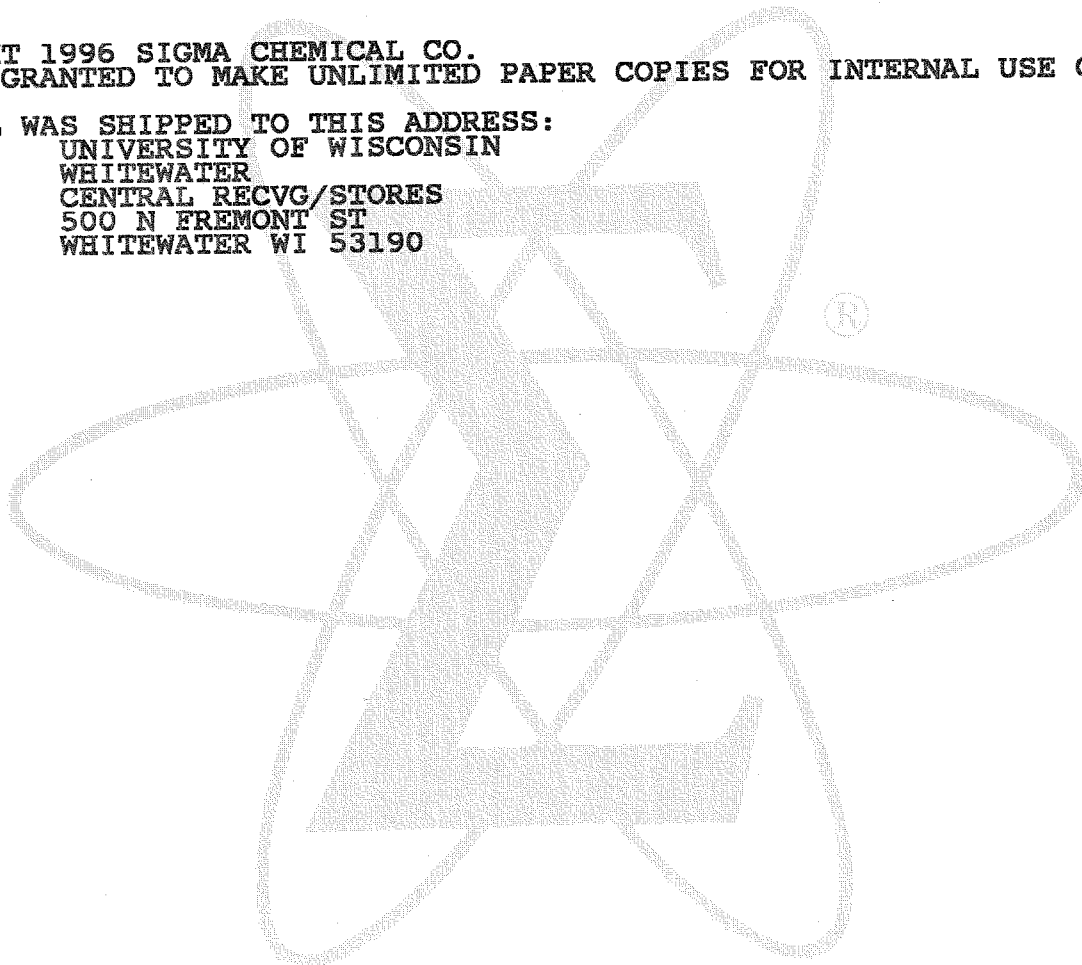
MATERIAL SAFETY DATA SHEET PAGE 6

THIS MSDS IS FOR A COMPONENT OF CATALOG #: 505-2

CATALOG #: HYDROCHLORIC ACID REAGENT  
NAME:

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