MATERIAL SAFETY DATA SHEET
EM SCIENCE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER..............: EM SCIENCE
A DIVISION OF EM INDUSTRIES
P.O. BOX 70
480 DEMOCRAT RD.
GIBBSTOWN, N.J. 08027

PREPARATION DATE.: 03/09/95
DATE MSDS PRINTED.: APR 17, 1995

INFORMATION PHONE NUMBER.: 609-354-9200
HOURS: MON. TO FRI. 8:30-5
CHEMTREC EMERGENCY NUMBER: 800-424-9300
HOURS: 24 HRS A DAY

CATALOG NUMBER(S):
HX0603  HX0603I  HX0603P  HX0603PS  HX0603T  HX0603TP
HX0603Y  HX0606  314  315  317  321

PRODUCT NAME......:
HYDROCHLORIC ACID

SYNONYMS............:
MURIATIC ACID, 23 DEG. BE

CHEMICAL FAMILY...:
INORGANIC ACID

FORMULA..........:
1000 PPM BA IN SOLUTION

MOLECULAR WEIGHT.:
36.46

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS #</th>
<th>APPR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>7647-01-0</td>
<td>100%</td>
</tr>
</tbody>
</table>

APPROXIMATE PER CENT INDICATES THAT THIS PRODUCT IS A
CONCENTRATED ACID. HYDROCHLORIC ACID IS APPROXIMATELY 37%.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
CAUSES SEVERE BURNS.
MAY BE FATAL IF INHALED OR SWALLOWED.
VAPOR EXTREMELY IRRITATING.
MAY CAUSE DAMAGE TO RESPIRATORY PASSAGES AND LUNGS.
APPEARANCE:.................
CLEAR, COLORLESS LIQUID; ACID ODOR

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

SYMPTOMS OF EXPOSURE:
EYE CONTACT CAUSES SEVERE BURNS AND PERMANENT EYE DAMAGE.
SKIN CONTACT CAUSES SEVERE BURNS, POSSIBLE DEEP ULCERATION.
INHALATION CAUSES DAMAGE TO NASAL AND RESPIRATORY PASSAGES,
PULMONARY EDEMA.
INGESTION CAUSES BURNS OF MOUTH, THROAT AND GASTROINTESTINAL TRACT.

MEDICAL COND. AGGRAVATED BY EXPOSURE:
RESPIRATORY CONDITIONS

ROUTES OF ENTRY:......................
INHALATION, INGESTION OR SKIN CONTACT.

CARCINOGENICITY:......................
The material is not listed (IARC, NTP, OSHA) as cancer causing agent.

4. FIRST AID MEASURES

EMERGENCY FIRST AID:
GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.
SKIN: IMMEDIATELY FLUSH THOROUGHLY WITH LARGE AMOUNTS OF WATER.
EYES: IMMEDIATELY FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES.
INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.
INGESTION: DO NOT INDUCE VOMITING; GIVE WATER OR MILK IF CONSCIOUS; GET MEDICAL ATTENTION.

5. FIRE FIGHTING MEASURES

FLASH POINT (F)..............: NONCOMBUSTIBLE
FLAMMABLE LIMITS LEL (%): N/A
FLAMMABLE LIMITS UEL (%): N/A
EXTINGUISHING MEDIA.......:
WATER SPRAY

FIRE FIGHTING PROCEDURES:.
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

FIRE & EXPLOSION HAZARDS:.
CONTACT WITH METALS PRODUCES HYDROGEN WHICH MAY FORM EXPLOSIVE MIXTURES WITH AIR.

. ACCIDENTAL RELEASE MEASURES
SPILL RESPONSE:
EVACUATE THE AREA OF ALL UNNECESSARY PERSONNEL.
WEAR SUITABLE PROTECTIVE EQUIPMENT LISTED UNDER EXPOSURE /
PERSONAL PROTECTION.
ELIMINATE ANY IGNITION SOURCES UNTIL THE AREA IS DETERMINED TO BE
FREE FROM EXPLOSION OR FIRE HAZARDS.
CONTAIN THE RELEASE AND ELIMINATE ITS SOURCE, IF THIS CAN BE DONE
WITHOUT RISK.
TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL AS DESCRIBED UNDER
DISPOSAL.
COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS ON REPORTING
RELEASES. REFER TO REGULATORY INFORMATION FOR REPORTABLE
QUANTITY AND OTHER REGULATORY DATA.
EM SCIENCE RECOMMENDS SPILL-X NEUTRALIZERS AND ABSORBENT AGENTS
FOR VARIOUS TYPES OF SPILLS.
ADDITIONAL INFORMATION ON THE SPILL-X PRODUCTS CAN BE PROVIDED
THROUGH THE EM SCIENCE TECHNICAL SERVICE DEPARTMENT
(609) 354-9200.
THE FOLLOWING EM SCIENCE SPILL-X NEUTRALIZER AND ABSORBENT IS
RECOMMENDED FOR THIS PRODUCT:

SX0861 ACID SPILL TREATMENT KIT

7. HANDLING AND STORAGE

HANDLING & STORAGE:
KEEP CONTAINER TIGHTLY CLOSED.
STORE IN A COOL, WELL-VENTILATED AREA

HANDLE EMPTY CONTAINERS WITH CAUTION.
ADD ACID CAUTIOUSLY TO WATER WHEN DILUTING - NEVER ADD WATER TO
ACID.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

VENTILATION, RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, EYE PROTECTION
RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT
OR ANY COMPONENT IS EXCEEDED (SEE TLV/PEL), A NIOSH/MSHA APPROVED
AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER
ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER
NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED
CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING
AND/OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE
EXPOSURE.
MATERIAL MUST BE HANDLED OR TRANSFERRED IN AN APPROVED FUME HOOD
MSDS (CONTINUED) - HX0603 PAGE # 3
OR WITH EQUIVALENT VENTILATION.
PROTECTIVE GLOVES (NEOPRENE, NITRILE OR EQUIVALENT) MUST BE
WORN TO PREVENT SKIN CONTACT.
SAFETY GLASSES WITH SIDE SHIELDS MUST BE WORN AT ALL TIMES.

WORK / HYgienIC PRACTICES:
WASH THOROUGHLY AFTER HANDLING.
DO NOT TAKE INTERNALLY.
EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

---

EXPOSURE GUIDELINES

OSHA - PEL:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>TWA</th>
<th>STEL</th>
<th>CL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPM MG/M3</td>
<td>PPM MG/M3</td>
<td>PPM MG/M3</td>
</tr>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>5</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

ACGIH - TLV:

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>TWA</th>
<th>STEL</th>
<th>CL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPM MG/M3</td>
<td>PPM MG/M3</td>
<td>PPM MG/M3</td>
</tr>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>5</td>
<td>7.5</td>
<td>5</td>
</tr>
</tbody>
</table>

10. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT (C 760 MMHG): 110°C 20.24%
MELTING POINT (C): -74°C
SPECIFIC GRAVITY (H2O = 1): 1.1885
VAPOR PRESSURE (MM HG): 160 20°C
PERCENT VOLATILE BY VOL (%): 99.9+
VAPOR DENSITY (AIR = 1): 1.25
EVAPORATION RATE (BUAC = 1): 2.0
SOLUBILITY IN WATER (%): MISCIBLE
APPEARANCE: CLEAR, COLORLESS LIQUID; ACID ODOR

10. STABILITY AND REACTIVITY

STABILITY: YES

HAZARDOUS POLYMERIZATION: DOES NOT OCCUR

HAZARDOUS DECOMPOSITION:

MSDS (CONTINUED) - HX0603 PAGE # 4
TOXIC HYDROGEN CHLORIDE GAS

CONDITIONS TO AVOID.....:
HEAT; CONTACT WITH METALS.

MATERIALS TO AVOID.....:
( ) WATER
( ) ACIDS
(X) BASES
( ) CORROSIVES
( ) OXIDIZERS
(X) OTHER:
ALKALIES AND AMINES; CONTACT WITH METALS PRODUCES HYDROGEN

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA:
IHL-HMN LDLO: 1300 PPM/30M
ORL-RBT LD50: 900 MG/KG

TOXICOLOGICAL FINDINGS:
TESTS ON LABORATORY ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE
MUTAGENIC AND REPRODUCTIVE EFFECTS.
CITED IN REGISTRY OF TOXIC EFFECTS OF SUBSTANCES (RTECS)

12. DISPOSAL CONSIDERATIONS

EPA WASTE NUMBERS: D002
TREATMENT:
SPECIFIED TECHNOLOGY - NEUTRALIZE TO PH 6-9. CONTACT YOUR LOCAL
PERMITTED WASTE DISPOSAL SITE (TSD) FOR PERMISSIBLE TREATMENT
SITES.
ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE
COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

13. TRANSPORT INFORMATION

DOT PROPER SHIPPING NAME....:
HYDROCHLORIC ACID, SOLUTION

DOT ID NUMBER..............:
UN1789

14. REGULATORY INFORMATION

MSDS (CONTINUED) - HX0603     PAGE # 5
**TSCA STATEMENT**

THIS PRODUCT IS A "MIXTURE". THE CAS NUMBERS OF ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>SARA EHS (302)</th>
<th>SARA EHS TPQ (LBS)</th>
<th>CERCLA RQ (LBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>Y</td>
<td>500</td>
<td>5000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>OSHA FLOOR LIST</th>
<th>SARA 313</th>
<th>DEMINIMIS FOR SARA 313 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>Y</td>
<td>Y</td>
<td>1.0</td>
</tr>
</tbody>
</table>

15. OTHER INFORMATION

COMMENTS:
NONE

NFPA HAZARD RATINGS:

- HEALTH: 3
- FLAMMABILITY: 0
- REACTIVITY: 0
- SPECIAL HAZARDS:

REVISION HISTORY:
11/01/83  03/01/84  11/01/84  12/08/86  10/27/87  02/20/90  03/01/91
11/26/91  12/08/92  04/27/93  03/03/94

| = REVISED SECTION
N/A = NOT AVAILABLE
N/E = NONE ESTABLISHED

THE STATEMENTS CONTAINED HEREIN ARE OFFERED FOR INFORMATIONAL PURPOSES ONLY AND ARE BASED UPON TECHNICAL DATA THAT EM SCIENCE BELIEVES TO BE ACCURATE. IT IS INTENDED FOR USE ONLY BY PERSONS HAVING THE NECESSARY TECHNICAL SKILL AND AT THEIR OWN DESCRIPTION AND RISK. SINCE CONDITIONS AND MANNER OF USE ARE OUTSIDE OUR CONTROL, WE MAKE NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE.

PORTIONS COPYRIGHT ARIEL RESEARCH CORPORATION, 1993. RESTRICTED USE CONDITIONS APPLY. SELECTED REGULATORY INFORMATION IN EMCIS HAS BEEN DERIVED FROM ARIEL RESEARCH CORP’S. INTERNATIONAL CHEMICAL REGULATORY MONITORING SYSTEM (ICRMS). USE OF THIS DATA IS SUBJECT TO THE TERMS OF A LICENSE AGREEMENT BETWEEN EM MSDS (CONTINUED) - HX0603 PAGE # 6