

Material Safety Data Sheet

Hydrochloric Acid 1.000N

Effective 3/4/2003 Date

In Case of Emergency Call 800-424-9300 CHEMTREC (USA)

613-996-6666 CANUTEC (Canada)

24 Hours/Day: 7 Days/Week

Section 1. Product and Company Identification

Product Name Hydrochloric Acid 1.000N Product VW3202 Code Manufacturer EMD Chemicals Inc. P.O. Box 70 480 Democrat Road Gibbstown, NJ 08027

Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc. For More Information Call 856-423-6300 Technical Service

Monday-Friday: 8:00 AM - 5:00 PM

Synonym None. Material Uses Laboratory Reagent Chemical Mineral Acid solution Family

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight	Hydrochloric acid	7647-01-0	3	Water	7732-18-5	97
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Section 3. Hazards Identification Physical State and Liquid.

Appearance Emergency WARNING ! Overview CAUSES EYE BURNS. MAY CAUSE RESPIRATORY TRACT AND EYE BURNS. HARMFUL IF INHALED OR SWALLOWED. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA. MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA. Routes of Entry Dermal contact. Eye contact. Inhalation. Ingestion. Potential Acute Health Effects Eyes Hazardous in case of eye contact (corrosive, irritant). Causes eye burns. Inflammation of the eye is characterized by redness, watering, and itching. Skin Hazardous in case of skin contact (corrosive). Skin contact may produce burns. Inhalation May be hazardous in case of inhalation (lung corrosive, lung irritant). Ingestion Hazardous in case of ingestion. Potential Chronic Health Effects Hydrochloric Acid 1.000N Carcinogenic This material is not known to cause cancer in animals or humans. Effects Additional information See Toxicological Information (section 11) Medical Conditions Repeated or prolonged contact with spray mist may produce chronic eye Aggravated by irritation and severe skin irritation. Repeated or prolonged exposure to Overexposure: spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately. Skin Contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately. Ingestion If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the May be combustible at high temperature. Product Auto-ignition Not available. Temperature Flash Points Not available. Flammable Limits Not available. Products of Not applicable. Combustion Fire Hazards in Not available. Presence of Various Substances Explosion Hazards Risks of explosion of the product in presence of static discharge: No. in Presence of Various Substances Risks of explosion of the product in presence of mechanical impact: No. Fire Fighting Media SMALL FIRE: Use DRY chemical powder. and Instructions LARGE FIRE: Use water spray, fog or foam. Do not use water jet. Protective Clothing Be sure to use an approved/certified respirator or equivalent. (Fire) Special Remarks Flammable hydrogen gas may be produced on prolonged contact with on Fire Hazards metals such as aluminum, tin, lead and zinc. (Hydrochloric acid) Special Remarks on Not available. Explosion Hazards Hydrochloric Acid 1.000N

Section 6. Accidental Release Measures

Small Spill and Dilute with water and mop up, or absorb with an inert dry material and Leak place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate. Large Spill and Stop leak if without risk. Absorb with DRY earth, sand or other Leak non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities. Spill Kit The following EM SCIENCE SpillSolv (TM) absorbent is recommended Information for this product: SX1310 Acid Treatment Kit

Section 7. Handling and Storage

Handling Do not ingest. Do not breathe the vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Storage Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Provide exhaust ventilation or other engineering controls to keep the Controls airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location. Personal Protection Eyes Face shield. Body Full suit. Respiratory Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Hands Gloves. Feet No special recommendations. Protective Clothing Personal Protection Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A in Case of a Large self-contained breathing apparatus should be used to avoid inhalation of Spill the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Product Name Exposure Limits Hydrochloric acid BAUA (Germany, 1997). Spitzenbegrenzung: 8 mg/m³ TWA: 8 mg/m³ 8 hour(s). DK-Arbejdstylsinet (Denmark, 1996). Loftvaerdi: 7 mg/m³ Loftvaerdi: 5 ppm GV: 7 mg/m³ 8 hour(s). GV: 5 ppm 8 hour(s). Water average: 100.2°C (212.4°F) May start to solidify at -0.1°C (31.8°F) based on data for: Water. Weighted average: -2.32°C (27.8°F) The lowest known value is 51.5°C (124.7°F) (Hydrochloric acid). The only known value is 1.2 (Water = 1) (Hydrochloric acid). The highest known value is 21.3 kPa (160 mmHg) (@ 20°C) (Hydrochloric acid).

The highest known value is >1 (Air = 1) (Hydrochloric acid). Not available. 0.36 (Water) compared to (n-Butyl Acetate = 1) Not available. Soluble in water. Hydrochloric Acid 1.000N 80/1107/EEC (Europe, 1996). STEL: 10 mg/m³ 15 minute(s). STEL: 15 ppm 15 minute(s). TWA: 5 mg/m³ 8 hour(s). TWA: 8 ppm 8 hour(s). EH40-OES (United Kingdom (UK), 1997). STEL: 8 mg/m³ 15 minute(s). STEL: 5 ppm 15 minute(s). TWA: 2 mg/m³ 8 hour(s). TWA: 1 ppm 8 hour(s). ACGIH (United States, 1994). CEIL: 7.5 mg/m³ CEIL: 5 ppm NIOSH REL (United States, 1994). CEIL: 7 mg/m³ CEIL: 5 ppm OSHA Final Rule (United States, 1989). CEIL: 7 mg/m³ CEIL: 5 ppm Not available.

Section 9. Physical and Chemical Properties

Odor mild Hydrogen chloride odour Color Clear. Colorless. Physical State and Liquid. Appearance Molecular Weight Not applicable. Molecular Formula Not applicable. pH Boiling/Condensation The lowest known value is 99.9°C (211.8°F) (Water). Weighted Point Melting/Freezing Point Critical Temperature Specific Gravity Vapor Pressure Vapor Density Odor Threshold Evaporation Rate LogKow Solubility

Section 10. Stability and Reactivity

Stability and The product is stable. Reactivity Conditions of Not available. Instability Incompatibility with Highly reactive with organic materials, metals, alkalis. Hydrochloric Acid 1.000N Various Substances Rem/Incompatibility Incompatible with Strong Bases Avoid excessive heat. Reacts with most metals to produce flammable H₂ gas. May initiate the polymerization of organic oxides and other monomers.

Hazardous Hydrogen Chloride (HCl) Decomposition Products Hazardous Will not occur. Polymerization

Section 11. Toxicological Information

RTECS Number: Hydrochloric Acid MW4025000 Water ZC0110000 Toxicity Acute oral toxicity (LD₅₀): 30000 mg/kg (Rabbit) (Calculated value for the mixture). Acute toxicity of the vapor (LC₅₀): 18467 ppm 4 hours (Mouse) (Calculated value for the mixture). Chronic Effects on Not available. Humans Acute Effects on Hazardous in case of eye contact (corrosive, irritant). Causes eye burns. Humans Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (corrosive). Skin contact may produce burns. May be hazardous in case of inhalation (lung corrosive, lung irritant). Hazardous in case of ingestion. Synergetic Products Not available. Toxicologically Irritancy Draize Test: Not available. Sensitization Slightly hazardous in case of inhalation (lung sensitizer). Carcinogenic This material is not known to cause cancer in animals or humans. Effects Toxicity to Not available. Reproductive System Teratogenic Effects Not available. Mutagenic Effects Not available.

Section 12. Ecological Information

Ecotoxicity Not available. BOD₅ and COD Not available. Toxicity of the The products of degradation are as toxic as the product itself. Products of Biodegradation

Section 13. Disposal Considerations

EPA Waste D002 Number Treatment Specified technology- Neutralize to pH 6-9. Contact your local permitted waste disposal site (TSD) for permissible treatments sites. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO Hydrochloric Acid 1.000N ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14. Transport Information

DOT Classification Proper Shipping Name: HYDROCHLORIC ACID SOLUTION Hazard Class: 8 UN number: UN1789 Packing Group: II RQ: Not applicable. TDG Classification Not available. IMO/IMDG Not available. Classification ICAO/IATA Not available. Classification

Section 15. Regulatory Information

U.S. Federal TSCA 8(b) inventory: Hydrochloric Acid 1.000N Regulations SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 302/304 emergency planning and notification: Hydrochloric acid SARA 302/304/311/312 hazardous chemicals: Hydrochloric acid SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Hydrochloric acid: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard SARA 313 toxic chemical notification and release reporting: Hydrochloric acid 3% Clean Water Act (CWA) 307: No products were found. Clean Water Act (CWA) 311: Hydrochloric acid Clean air act (CAA) 112 accidental release prevention: Hydrochloric acid Clean air act (CAA) 112 regulated flammable substances: No products were found. Clean air act (CAA) 112 regulated toxic substances: Hydrochloric acid WHMIS (Canada) CLASS E: Corrosive liquid. CEPA DSL: Hydrochloric acid; Water This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information. International Regulations EINECS Hydrochloric acid 231-595-7 Water 231-791-2 DSCL (EEC) R36/38- Irritating to eyes and skin. International Australia (NICNAS): Hydrochloric acid; Water Lists Japan (MITI): Hydrochloric acid; Water Korea (TCCL): Hydrochloric acid; Water Hydrochloric Acid 1.000N Philippines (RA6969): Hydrochloric acid; Water China: No products were found. State Regulations Pennsylvania RTK: Hydrochloric acid: (environmental hazard, generic environmental hazard) Massachusetts RTK: Hydrochloric acid New Jersey: Hydrochloric Acid 1.000N California prop. 65: No products were found.

Section 16. Other Information

National Fire Protection Association Health² (U.S.A.) Fire Hazard Reactivity Specific Hazard Changed Since Last + Revision Notice to Reader The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.