GARDENA, CA
NEW BRUNSWICK, NJ

Material Safety Data Sheet

NFPA	HMIS	Personal Protective Equipment
	Health Hazard 3 Fire Hazard 0 Reactivity 0	 See Section 15.

Section 1. Chemical Product and Company Identification

Common Name/ Trade Name: Molybdenum ICP Standard, 1000 ppm

Manufacturer: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Commercial Name(s): Not available.

Synonym: Molybdenum Plasma Emission Standard, 10000 ppm; Molybdenum Plasma Emission Standard 1ml = 10 mg Mo

Chemical Name: Not applicable.

Chemical Family: Not available.

Chemical Formula: Not applicable.

Supplier: SPECTRUM LABORATORY PRODUCTS INC.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

Catalog Number(s).	PM235
CAS#	Mixture.
RTECS	Not applicable.
TSCA	TSCA 8(b) inventory: Water; Hydrogen fluoride; Hydrochloric acid; Molybdenum trioxide
CI#	Not available.

IN CASE OF EMERGENCY
CHEMTREC (24hr) 800-424-9300

CALL (310) 516-8000

Section 2.Composition and Information on Ingredients

		Exposure Limits			
Name	**CAS #**	**TWA (mg/m³)**	**STEL (mg/m³)**	**CEIL (mg/m³)**	**% by Weight**
1) Water	7732-18-5				97.8-97.9
2) Hydrogen fluoride	7664-39-3		3	6	0.144
3) Hydrogen chloride	7647-01-0		5	5	2.1-2.2
4) Molybdenum trioxide	1313-27-5	5		10	0.1

Toxicological Data on Ingredients

Hydrogen chloride:
GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].
Molybdenum trioxide:
ORAL (LD50): Acute: 125 mg/kg [Rat]. 2689 mg/kg [Rat].

Continued on Next Page

Section 3. Hazards Identification

Potential Acute Health Effects	Very hazardous in case of skin contact (irritant), of eye contact (irritant). Hazardous in case of ingestion. Slightly hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), inhalation. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Potential Chronic Health Effects	Slightly hazardous in case of skin contact (sensitizer). **CARCINOGENIC EFFECTS**: Classified 3 (Not classifiable for human.) by IARC [Hydrogen chloride]. **MUTAGENIC EFFECTS**: Not available. **TERATOGENIC EFFECTS**: Not available. **DEVELOPMENTAL TOXICITY**: Not available. The substance may be toxic to kidneys, liver, upper respiratory tract, skin, eyes, , bones, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to 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.
Serious Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Serious Inhalation	Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.
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.
Serious Ingestion	Not available.

Section 5. Fire and Explosion Data

Flammability of the Product	Non-flammable.
Auto-Ignition Temperature	Not applicable.
Flash Points	Not applicable.
Flammable Limits	Not applicable.
Products of Combustion	Not available.
Fire Hazards in Presence of Various Substances	Not applicable.
Explosion Hazards in Presence of Various Substances	Non-explosive in presence of open flames and sparks, of shocks.
Fire Fighting Media and Instructions	Not applicable.

Continued on Next Page

Special Remarks on Fire Hazards	Not available.
Special Remarks on Explosion Hazards	It's corrosive action metals can result in formation of hydrogen in containers and piping to create explosion hazard. Polymerization of cyanogen fluoride is rapid at ambient temp. and explosive in presence of hydrogen fluoride. Hydrogen fluoride + nitric acid and glycerol generates enough pressure during storage for 4 hr. to rupture the closed plastic containers. (Hydrogen fluoride)

Section 6. Accidental Release Measures

Small Spill	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill	Corrosive liquid. Stop leak if without risk. Absorb with DRY earth, sand or other 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. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7. Handling and Storage

Precautions	Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	Safety glasses or splash goggles. Lab coat or Synthetic apron. Gloves (impervious). Respiratory protection is not necessary. Normal room ventilation is adequate.
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits	**Hydrogen fluoride** STEL: 2.3 (mg/m^3) from ACGIH (TLV) [United States] STEL: 3 (ppm) from ACGIH (TLV) [United States] CEIL: 6 from NIOSH CEIL: 5 (mg/m^3) from NIOSH TWA: 3 STEL: 6 (ppm) from OSHA (PEL) [United States] **Hydrogen chloride** STEL: 7.5 (mg/m^3) from ACGIH (TLV) [United States] STEL: 5 (ppm) from ACGIH (TLV) [United States] CEIL: 5 (ppm) from NIOSH CEIL: 7.5 (mg/m^3) from NIOSH CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m^3) from OSHA (PEL) [United States] **Molybdenum trioxide** TWA: 5 CEIL: 10 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and appearance	Liquid.	**Odor**	Odorless.
Molecular Weight	Not applicable.	**Taste**	Not available.
pH (1% soln/water)	Neutral.	**Color**	Clear Colorless.
Boiling Point	The lowest known value is 100°C (212°F) (Water).		
Melting Point	Not available.		

Continued on Next Page

Critical Temperature	Not available.
Specific Gravity	Weighted average: 1.01 (Water = 1)
Vapor Pressure	The highest known value is 2.3 kPa (@ 20°C) (Water).
Vapor Density	The highest known value is 0.62 (Air = 1) (Water).
Volatility	Not available.
Odor Threshold	Not available.
Water/Oil Dist. Coeff.	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	See solubility in water, diethyl ether.
Solubility	Easily soluble in cold water. Soluble in hot water, diethyl ether.

Section 10. Stability and Reactivity Data

Stability	The product is stable.
Instability Temperature	Not available.
Conditions of Instability	Incompatible materials
Incompatibility with various substances	Slightly reactive to reactive with oxidizing agents, organic materials, metals, alkalis.
Corrosivity	Slightly corrosive in presence of aluminum. Non-corrosive in presence of glass.
Special Remarks on Reactivity	Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride causes aldehydes and epoxides to violently polymerize. It reacts with oxidizers releasing chlorine gas. Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or other violent/vigorous reaction: Acetic anhydride, Alcohols + hydrogen cyanide, Aluminum, Aluminum phosphide, Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium, Ammonium hydroxide, 1,4-Benzoquinone diimine, Calcium acetylide (incandescence upon warming), Calcium carbide, Calcium phosphide, Carbon tetrachloride + silver perchlorate (produce trichlormethyl perchlorate), Cesium acetylene carbide, Cesium carbide, Cesium telluroacylates, Chlorine + dinitroanilines (evolves gas), Chloroacetaldehyde oxime, Chlorosulfonic acid, Cyanogen chloride (when catalyzed by HCl), 1,1-Difluoroethylene, Dinitroanilines, Ethylene, Ethylene diamine, Ethyl 2-formylpropionate oxime (when generated by using HCl as a catalyst), Ethylene imine, Fluorine, HClO4, Hexalithium disilicide, Hydrogen peroxide, Lithium silicide, Metal acetylides, carbides, Magnesium boride, Methyl vinyl ether, Mercuric sulfate, Nitric acid + glycerol, Oleum, Perchloric acid, Potassium, Potassium permanganate, beta-Propiolactone, Propylene oxide, Rubidium acetylide, Rubidium carbide, Rubidium acetylene carbide, Silicon dioxide, Silver chlorite, Sodium (with aqueous HCl), Sodium 2-allyloxy-6-nitrophenylpyruvate oxime, Sodium hydroxide, Sodium tetraselenium, Sulfonic acid, Sulfuric acid, Tetraselenium tetranitride, 2,4,6-Tri(2-acetylhydrazino)-1,3,5-trinitrobenzene, Uranium phosphide, Vinyl acetate. Hydrogen chloride gas can react with formaldehyde to form bis(chloromethyl)ether, a human carcinogen. Most metals, as well as certain coatings, plastics, and rubbers, are attacked by hydrogen chloride. Addition of hydrochloric acid to the following results in an exothermic reaction: Cesium cyanotridecahydrodecarborate(2-), Potassium ferricyanide, Vinylidene fluoride. Addition of hydrochloric acid to potassium ferrocyanide or ammonium hexacyanoferrate(II) results in an endothermic reaction. Hydrochloric acid in the presence of alcohol and glycols results in dehydration reactions. (Hydrogen chloride)

Continued on Next Page

Special Remarks on Corrosivity	This compound is highly corrosive when in solution (especially to most metals except: gold, mercury, platinum, silver, and tantalum). The anhydrous gas is not corrosive . (Hydrogen chloride)
Polymerization	Will not occur.

Section 11. Toxicological Information

Routes of Entry	Absorbed through skin. Eye contact. Inhalation. Ingestion.
Toxicity to Animals	Acute oral toxicity (LD50): 125 mg/kg [Rat]. (Molybdenum trioxide).
Chronic Effects on Humans	**CARCINOGENIC EFFECTS**: Classified 3 (Not classifiable for human.) by IARC [Hydrogen chloride]. Contains material which may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, , bones, teeth.
Other Toxic Effects on Humans	Very hazardous in case of skin contact (irritant). Hazardous in case of ingestion. Slightly hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive), of inhalation.
Special Remarks on Toxicity to Animals	Hydrochloric Acid 37% Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 1 hours [Rat].
Special Remarks on Chronic Effects on Humans	May cause adverse reproductive effects (fetoxicity). May affect genetic material.
Special Remarks on other Toxic Effects on Humans	Acute Potential Health Effects: Skin: Mildly Corrosive. Causes severe skin irritation and possible burns. Eyes: Mildly Corrosive. Causes severe eye irritation and possible burns. Inhalation: May cause irritation of the nose, throat, bronchi (upper respiratory tract), coughing, sneezing, hoarseness. May affect the lungs/respiration. May affect the liver. Ingestion: Causes irritation gastrointestinal tract with nausea, vomiting abdominal cramps, and diarrhea with possible burns to the mouth, throat, esophagus . May affect behavior, the cardiovascular system, respiration and urinary system (kidneys). Chronic Potential Health Effects: Prolonged or repeated inhalation or ingestion may affect liver, respiration(changes in pulmonary function, chronic bronchitis), teeth (yellowing of teeth and erosion of tooth enamel), kidneys, and behavior. Prolonged or repeated skin contact may cause dermatitis.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Products of Biodegradation	Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	Not available.

Continued on Next Page

Section 13. Disposal Considerations

Waste Disposal Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14. Transport Information

DOT Classification Class 8: Corrosive material

Identification : Hydrochloric acid, solution UNNA: 1789 PG: III

Special Provisions for Transport Inhalation hazard zone C (Hydrogen fluoride)

DOT (Pictograms)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations

Connecticut hazardous material survey.: Hydrogen fluoride; Hydrochloric acid
Illinois toxic substances disclosure to employee act: Hydrogen fluoride; Hydrochloric acid
Illinois chemical safety act: Hydrogen fluoride; Hydrochloric acid
New York release reporting list: Hydrogen fluoride; Hydrochloric acid
Rhode Island RTK hazardous substances: Hydrogen fluoride; Hydrochloric acid
Pennsylvania RTK: Hydrogen fluoride; Hydrochloric acid; Molybdenum trioxide
Minnesota: Hydrogen fluoride; Hydrochloric acid
Massachusetts RTK: Hydrogen fluoride; Hydrochloric acid; Molybdenum trioxide
Massachusetts spill list: Hydrogen fluoride; Hydrochloric acid
New Jersey: Hydrogen fluoride; Hydrochloric acid
New Jersey spill list: Hydrogen fluoride; Hydrochloric acid
Louisiana RTK reporting list: Hydrogen fluoride; Hydrochloric acid
Louisiana spill reporting: Hydrogen fluoride; Hydrochloric acid
California Director's List of Hazardous Substances: Hydrochloric acid
TSCA 8(b) inventory: Water; Hydrogen fluoride; Hydrochloric acid; Molybdenum trioxide
TSCA 4(a) proposed test rules: Hydrogen fluoride; Hydrochloric acid
SARA 302/304/311/312 extremely hazardous substances: Hydrogen fluoride; Hydrochloric acid
SARA 313 toxic chemical notification and release reporting: Hydrochloric acid 5%; Molybdenum trioxide 1%
CERCLA: Hazardous substances.: Hydrogen fluoride: 100 lbs. (45.36 kg); Hydrochloric acid: 5000 lbs. (2268 kg);

California Proposition 65 Warnings

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.

Other Regulations OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications

WHMIS (Canada) CLASS E: Corrosive liquid.

DSCL (EEC) R34- Causes burns.

S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Continued on Next Page

HMIS (U.S.A.)

Health Hazard	3
Fire Hazard	0
Reactivity	0
Personal Protection	C

National Fire Protection Association (U.S.A.)

Health

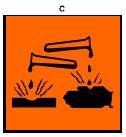
Flammability

Reactivity

Specific hazard

WHMIS (Canada) (Pictograms)

DSCL (Europe) (Pictograms)



TDG (Canada) (Pictograms)

ADR (Europe) (Pictograms)

Protective Equipment

Gloves (impervious).

Synthetic apron.

Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16. Other Information

MSDS Code	**PMOLY**
References	Not available.
Other Special Considerations	Not available.

Validated by Sonia Owen on 8/11/2006.

Verified by Sonia Owen.

Printed 9/12/2006.

Continued on Next Page

CALL (310) 516-8000

Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.