MATERIAL SAFETY DATA SHEET

Product Name: Quimag Quimicos Aguila Copper Sulfate Crystal
Date Prepared: June 23, 2005 Date Revised: June 30, 2005

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Chemical Name: Copper Sulfate Pentahydrate **CAS #:** 7758-99-8
Synonyms: Bluestone; Blue Vitriol; Cupric sulfate
Product Use: For Commercial Use
Registration Number: 73385-1
Company Name:
Fabrica de Sulfato el Aguila, S.A. de C.V. Phone: (52+33) 3688-6719
Carr. Guadalajara-Chapala Km. 17.5 Nº 8100
Tlajomulco de Zuñiga, Jalisco C.P. 45640 Mexico Emergency: CHEMTREC (800) 424-9300 (24 hours)

Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS #	Component	Percent	EHS	NTP	IARC	Sub Z	SARA 313	OSHA PEL	ACGIH TLV	Other Limits
7758-99-8	Copper Sulfate Pentahydrate	99%	N	N	N	Y	Y	1 mg/M3	1 mg/M3	1 mg/M3

Section 3 - HAZARDS IDENTIFICATION

Emergency Overview
Copper Sulfate Crystal is a blue crystalline odorless solid. Potentially fatal if swallowed. May cause irritation to the eyes and skin. Fire may produce irritating, corrosive and/or toxic fumes. Firefighters should use full protective equipment and clothing.

Hazard Category:

☒ Acute ☒ Chronic ☐ Fire ☐ Pressure ☐ Reactive

HMIS ratings: Health Hazard: 2* **Fire Hazard:** 0 **Physical Hazard:** 1
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic Hazard

Section 4 - FIRST AID MEASURES

Route(s) of Entry:
Eye, Skin, Ingestion

Health Hazards (Acute and Chronic):
Can cause skin and eye irritation. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated contact may cause conjunctivitis.

Signs and Symptoms:
EYE: Can cause severe eye irritation and may result in irreversible eye damage.
SKIN CONTACT: Can cause severe skin irritation. May cause localized discoloration of the skin.
INGESTION: Can result in digestive tract irritation with abdominal pain.

Section 4 - FIRST AID MEASURES (Continued)

Emergency First Aid Procedure:
If in eyes:

- Flush with plenty of water. Call a physician.

If on skin:

- Wash with plenty of soap and water. Get medical attention.

If swallowed:

- Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol.

Other Health Warnings:
Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

Section 5 - FIRE FIGHTING MEASURES

Flash Point: N/A
Method Used: N/A
Upper Flammable Limit: N/A
Lower Flammable Limit: N/A
Auto Ignition: N/A
Flammability Classification: N/A
Rate of Burning: N/A

General Fire Hazards
Copper Sulfate Pentahydrate is not combustible, but may decompose in the heat of a fire to produce corrosive and/or toxic fumes.

Hazardous Combustion Products
Sulfur oxides and copper fumes

Extinguishing Media
Dry chemical, carbon dioxide, water spray or foam. For large fires use water spray, for or alcohol foam.

Fire Fighting Equipment / Instructions
Firefighters should wear full protective clothing including self-contained breathing apparatus. Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution. Avoid direct water stream on molten material, move containers from fire area if possible, do not scatter spilled area with more water than needed for fire control, dike fire control water for later disposal. Use agents suitable for type of fire. Avoid breathing vapors or dust.

NFPA Ratings: Health: 2 **Fire:** 0 **Reactivity:** 1 **Other:**
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Section 6 - ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled:
Use clean-up methods that avoid dust generation (vacuum, wet). Wear a NIOSH or MSHA approved respirator if dust will be generated in clean-up. Use protective clothing if skin contact is likely. If spilled solution is in a confined area, introduce lime or soda ash to form insoluble copper salts and dispose of by approved method. Prevent accidental entry of solution into streams and other water bodies. Shovel any spills into plastic bags and seal with tape. Copper sulfate solution may deteriorate concrete.

Section 7 - HANDLING AND STORAGE

Precautions to be Taken:
Avoid breathing dust or solution mist. Sweep up crystals or powder, vacuum is preferred. Eye wash stations should be available in work areas. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Other Precautions:
Store in closed containers in cool, dry, well-ventilated area away from heat sources and reducing agents. Store copper sulfates in stainless steel, fiberglass, polypropylene, PVC's or plastic equipment. If container or bag is damaged, place the container or bag in a plastic bag. Use good housekeeping practices to avoid dust accumulation.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTIVE EQUIPMENT

Ventilation Requirements:
Use adequate general or local ventilation to keep airborne concentrations below the exposure limits.

Personal Protective Equipment:

Respirator:	NIOSH approved respirator for toxic dust mist. The respirator selected must be based on contamination levels found in the work area. Supply air respirator with full-face piece.
Immediately Dangerous Life or Health Conditions:	Self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.
Clothing:	Individuals must wear appropriate protective clothing and equipment to prevent repeated or prolonged skin contact.
Gloves:	Individuals must wear appropriate gloves to prevent contact with substance.
Eye-Protection:	Individuals must wear splash proof or dust resistance safety goggles to prevent eye contact with this substance.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Chemical Formula: $CuSO_4*5H_2O$
Appearance and Odor: Blue crystals, odorless
Specific Gravity (H_2O = 1): 2.284
Solubility (H_2O): 22.37% @ 0°C, 117.95% @ 100°C
Molecular Weight: 249.68
Melting Point: 110°C
Vapor Density (Air = 1): 8.6 mm Hg
Vapor Pressure (mm Hg): N/A
Evaporation Rate (Butyl Acetate = 1): NI
pH: 3.7 - 4.2 (10% solution)

Solvent Solubility: Solvent in methanol, glycerol and slightly soluble in ethanol.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

Stability:
Stable under normal temperatures and pressures.

Incompatibility (Materials to Avoid):
None when product remains dry. Acetylene gas, aluminum powder, hydroxylamine, magnesium, moist air. Contact with magnesium metal can generate dangerous levels of hydrogen gas.

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION (Continued)

Decomposition / By-Products:
At temperatures >600˚C material decomposes to cupric oxide and sulfur dioxide.

Hazardous Polymerization:
Will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

Dermal LD50: >5050 mg/kg (rabbit)
Oral LD50: 352 mg/kg (rat)
Inhalation LC50: N/A
Primary Eye Irritation: Irritant
Primary Skin Irritation: Irritant
Carcinogenic: Not listed by NTP, IARC, or OSHA.

Poisoning may affect the liver and/or kidneys and gastrointestinal tract. Persons with a history of chronic respiratory or skin disease may be at increased risk from exposure.

Section 12 - ECOLOGICAL INFORMATION

This pesticide is toxic to fish. Direct application of copper sulfate to water may cause a significant reduction in population of aquatic invertebrates, plants and fish. Do not treat more than one-half of a lake or pond at one time in order to avoid depletion of oxygen from decaying vegetation. Allow 1 to 2 weeks between treatment for oxygen levels to recover. Trout and other species of fish may be killed at application rates recommended on this label, especially in soft or acid waters. However, fish toxicity generally decreases as the hardness of water increases. Do not contaminate water by cleaning of equipment or disposal of wastes.

This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority, except when product is labeled for use in sewers and bears such use instructions. For guidance, contact your State Water Board or Regional Office of the EPA.

Subacute Dietary LC50: >10,000 ppm (quail and duck)
96-hr Acute Toxicity LC50: 0.65 ppm (bluegill), 0.056 ppm (trout), 16 ppm (pink shrimp)
48-hr EC50: 54 ppb (eastern oysters)
48-hr LC50: 17 ppm (pink shrimp), 600 ppb (daphnia)
24-hr LC50: 6.9 ppm (blue crab), 600 ppb (daphnia)
Bioaccumulation: Not available

Section 13 - DISPOSAL CONSIDERATIONS

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal: (Paper Bag)
If empty: Do not reuse this container. Dispose of empty bag in a sanitary landfill or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.
If partly filled: Call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Never place unused product down any indoor or outdoor drain.

Section 13 - DISPOSAL CONSIDERATIONS (Continued)

Container Disposal: (Plastic Pail)

If empty: Do not reuse this container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

If partly filled: Call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Never place unused product down any indoor or outdoor drain.

Section 14 - TRANSPORTATION INFORMATION

	Proper Shipping Name	Hazard Class	ID	PG
DOT	Environmentally Hazardous Substance, Solid, N.O.S., (Cupric Sulfate)*	9	UN3077	III
	Reportable Quantity (RQ) = 10 pounds (4.54 kg)			

*Applicable when product is shipped in packaging of 10 pounds or greater.

Section 15 - REGULATORY INFORMATION

OSHA STATUS: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA STATUS: This product is exempt from TSCA Regulation under FIFRA Section 3(2)(B)(ii) when used as a pesticide.

SARA TITLE III:

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES: None
SECTION 311/312 HAZARD CATEGORIES: Immediate Health Hazard, Delayed Health Hazard
SECTION 313 TOXIC CHEMICALS: Copper Sulfate, anhydrous CAS # 7758-98-7

RCRA STATUS: When discarded in its purchased form, this product is a listed RCRA hazardous waste and should be managed as a hazardous waste. (40 CFR Part 261.20-24)

Section 16 - OTHER INFORMATION

The information and statements in this Material Safety Data Sheet are believed to accurately reflect the scientific evidence used in making the hazard determination, but is not to be construed as a warranty or representation for which we assume legal responsibility. Additional information may be necessary or desirable depending on particular, exceptional or variable conditions or circumstances of use or storage or because of locally applicable laws or government regulations. Therefore, you should use this information only as a supplement to other information available to you and must make independent determinations of the suitability of the information for your particular circumstances or conditions and of the completeness of the information available from all sources to assure both the proper use of the material described herein and the safety and health of employees.