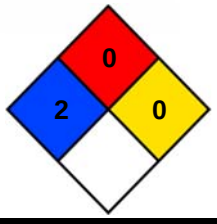
REV D 11/19/15
HG-160113-22

SAFETY DATA SHEET
HUMA GRO® Z-Max



HMIS	
HEALTH	2
FLAMMABILITY	0
PHYSICAL HAZARD	0
PPE	B

SECTION 1: CHEMICAL PRODUCT & COMPANY IDENTIFICATION

PRODUCT IDENTIFIER:	**HUMA GRO® Z-Max**	**Product# 280**
GENERAL USE:	Used as a part of a plant nutrition program.	
PRODUCT DESCRIPTION:	A clear to slightly hazy, greenish blue liquid having a slight characteristic odor.	

SUPPLIER INFORMATION:
Bio Huma Netics
1331 W Houston Avenue
Gilbert, AZ 85233

For Additional SDS call: **PHONE: (480) 961-1220**

EMERGENCY PHONE NUMBERS

CHEMTREC: **(In the USA) 800-424-9300**
(International) 703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

HAZARDS OVERVIEW:

A clear to slightly hazy, greenish blue, moderately acidic liquid having a slight characteristic odor. The liquid and mists may cause irritation to the eyes, skin and respiratory tract. This product may be toxic by ingestion or inhalation of high mist concentrations.

CLASSIFICATION: HAZARD CATEGORY 4
SIGNAL WORD: WARNING
HAZARD STATEMENT: H302; Harmful if Swallowed
PRECAUTIONARY STATEMENT: P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell, P330; Rinse Mouth P264; Wash hands thoroughly after handling, P270; Do not eat, drink or smoke when using this product.

CLASSIFICATION: MILD SKIN IRRITATION – HAZARD CATEGORY 3
SIGNAL WORD: WARNING
HAZARD STATEMENT: H316 - WARNING - causes mild skin irritation
PRECAUTIONARY STATEMENT: P332+P313; If skin irritation occurs: Get medical attention/advice.

SECTION 3: COMPOSITION & INFORMATION ON INGREDIENTS

				ACGIH		OSHA	
COMPONENT	**CAS #**	**OSHA HAZARD**	**WT %**	**$TLV_{(TWA)}$**	**STEL**	**$PEL_{(TWA)}$**	**STEL**
Zinc Sulfate	7733-02-0	Eye, Skin & Respiratory Irritant; Cardiovascular, ; Blood & Central Nervous System toxin	23 ± 3	None	None	None	None
Manganese Sulfate	7785-87-7	Eye, Skin & Respiratory Irritant; Central Nervous System toxin; Moderately toxic by Ingestion	6 ± 1	0.2 mg/m^3 Proposed: 0.02 mg/m^3 Respirable fraction	None	Ceiling 5 mg/m^3	None
Copper Sulfate *	7758-98-7	Eye, Skin & Respiratory Irritant; Blood, Liver & Kidney toxin	2 ± 1	1 mg/m^3 (Dusts & Mists as Cu)	None	None	None

* (DOT name is Cupric Sulfate)

NDA = No Data Available **N/A = Not Applicable**

SECTION 4: FIRST AID MEASURES

INHALATION: If inhaled, immediately move to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of clean running water for at least 15 minutes, lifting the upper and lower lids occasionally. Remove contact lenses, if worn. Get medical attention if irritation persists.

SKIN CONTACT: In case of contact, flush skin with plenty of clean running water. Remove contaminated clothing and shoes and wash before reuse. If irritation occurs and persists, get medical attention.

INGESTION: If large quantities of this product are swallowed, call a physician immediately. DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

NOTE TO PHYSICIANS: Based on component information, this product is slightly toxic by ingestion. If a large amount is ingested, consideration should be given to careful endoscopy as stomach or esophageal irritation may occur, with possible central nervous system effects following absorption into the blood stream. Careful gastric lavage with an endotracheal tube in place should be considered. Treat exposure symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

Flashpoint and Method: This product does not flash.

Flammable Limits (in air, % by volume) **Lower:** Not applicable **Upper:** Not applicable

Autoignition Temperature: Not Determined

GENERAL HAZARD: This product is an aqueous solution of inorganic salts that are in a moderately acidic solution. The Uniform Fire Code health hazard classification for this product is: **Irritant.** This product may produce hazardous mists or hazardous decomposition products.

FIRE FIGHTING INSTRUCTIONS: **EXTINGUISHING MEDIA:** Water, foam, CO_2 or dry chemicals.
Use a water spray or fog to cool the containers exposed to the heat of a fire.

FIRE FIGHTING EQUIPMENT: Fire fighters should wear full protective equipment, including self-contained breathing apparatus.

HAZARDOUS COMBUSTION PRODUCTS: When heated to dryness and decomposition, it emits toxic zinc, manganese and copper oxides, with trace or ultra-trace toxic oxide amounts, of potassium, nitrogen, sulfur, iron, magnesium, calcium, sodium and carbon.

SECTION 6: ACCIDENTAL RELEASE MEASURES

RELEASE TO LAND: Wearing recommended protective equipment and clothing, dike the spill and pick up the bulk of liquid using pumps or a vacuum truck, or absorb the liquid in sand or a commercially absorbent material. Place in approved containers for recovery, disposal, or satellite accumulation. Neutralize the acidity, of the remaining liquid, using soda ash, lime, or other agent appropriate for neutralizing acidic liquids. Flush the spill area with water; collect the rinsates for disposal or sewer, as appropriate.

RELEASE TO WATER: Wear recommended protective equipment and clothing if contact with hazardous material can occur. Stop or divert water flow. Dike contaminated water and remove for disposal and/or treatment. As appropriate, notify all downstream users of possible contamination.

SECTION 7: HANDLING AND STORAGE

STORAGE TEMPERATURE: Ambient **STORAGE PRESSURE:** Ambient

GENERAL: Store in a cool, dry, well-ventilated area away from incompatible materials and products. Do not get this product in eyes, on skin or on clothing. Wear recommended personnel protective equipment when handling this product. Do not breathe mists, vapors, fumes or aerosols. Use only with adequate ventilation. Do not take internally. Keep the container tightly closed when not in use. Wash thoroughly after handling this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

CONTROL MEASURES: Use a local or general, mechanical exhaust ventilation system capable of maintaining emissions, in the work area, below the OSHA-PEL, ACGIH-TLV or levels that may cause irritation.

RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT

RESPIRATOR: For exposure above the ACGIH-TLV, OSHA-PEL or levels that may cause irritation, wear a NIOSH-approved full facepiece or half mask air-purifying cartridge respirator equipped with a good mist / particulate filter cartridge or supplied air. **Note:** Always consult the respirator manufacturer's data when determining the suitability of respiratory protective devices prior to use.

EYES: Wear chemical goggles (recommended by ANSI Z87.1-1979), unless a full facepiece respirator is worn. **Note:** Always consult the protective eyewear manufacturer's data when determining the suitability of protective eyewear prior to use.

GLOVES: Wear Neoprene, Nitrile, Butyl Rubber, or Natural Rubber gloves. **Note:** Always consult the glove manufacturer's permeation data when determining the suitability of gloves prior to use.

CLOTHING & EQUIPMENT: If contact is likely, wear a Neoprene, Nitrile, Butyl Rubber, or Natural Rubber apron when handling this product. An eye wash station and safety shower should be available in the work area. **Note:** Always consult the clothing/equipment manufacturer's permeation data when determining the suitability of clothing/equipment prior to use.

FOOTWEAR: Wear Neoprene, Nitrile, Butyl Rubber or Natural Rubber boots. **Note:** Always consult the footwear manufacturer's permeation data when determining the suitability of footwear prior to use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear to slightly hazy, greenish blue	**Bulk Density (pounds/ft^3):**	Not applicable
Physical State:	Liquid	**Vapor Pressure:**	No data available
Odor:	Slight, characteristic	**Vapor Density (air=1):**	No data available
Odor Threshold:	No data available	**Evaporation Rate (n-Butyl Acetate=1):**	Less than 1
Molecular Formula:	Mixture	**VOC Content:**	Nil
Molecular Weight:	Not applicable	**% Volatile:**	Approximately 65
Boiling Point:	Greater than 100° C. (212° F.)	**Solubility in H_2O:**	Complete
Freezing/Melting Point:	Less than 0° C. (32° F.)	**Octanol/Water Partition Coefficient:**	No data available
Specific Gravity:	1.35 – 1.45 @ 20° C.	**pH (as is):**	2.5 - 3.5
Density (pounds/gallon):	Approximately 11.7	**pH (1% solution):**	No data available

SECTION 10: STABILITY AND REACTIVITY

GENERAL: This product is stable and hazardous polymerization will not occur.

CONDITIONS TO AVOID: Do not store this product below 50° F (10° C) or above 90° F (30° C)

INCOMPATIBLE MATERIAL: Contact caustics and alkali, sulfides, sulfites, cyanides and chlorine releasers.

HAZARDOUS DECOMPOSITION PRODUCTS: When heated to dryness and decomposition, it emits toxic oxides of zinc, manganese and copper, with trace or ultra-trace toxic oxide amounts of potassium, nitrogen, sulfur, iron, magnesium, calcium, sodium and carbon.

SENSITIVITY TO MECHANICAL IMPACT: This product is not sensitive to mechanical impact.

SENSITIVITY TO STATIC DISCHARGE: This product is not sensitive to static discharge.

SECTION 11: TOXICOLOGICAL INFORMATION

Components:	**Zinc Sulfate**	**Manganese Sulfate**
Eye Contact:	Rabbit: 420 ug; Moderate	No data available
Skin Contact:	No data available	No data available
Oral Rat LD_{50}:	1,710 mg/kg	2,150 mg/kg
Dermal Rabbit LD_{50}:	No data available (Subcutaneous LD_{Lo}: 300 mg/kg)	No data available
Inhalation Rat LC_{50}:	No data available	No data available
Human Data:	Oral Human TD_{Lo}: 45 mg/kg/7 Days; Cardiac & Blood Effects	No data available
Other Toxicological Data:	Subcutaneous Rat LD_{Lo}: 330 mg/kg	Oral Mouse LD_{50}: 2,330 mg/kg
Carcinogenicity:	Subcutaneous Rabbit LD_{Lo}: 3,625 ug/kg/5 Days – Tumorigenic – Tumors at site of application	Intraperitoneal Mouse TD_{Lo}: 660 mg/kg/8 Weeks; Tumorigenic – Neoplastic by RTECS criteria
Teratogenicity:	Oral Rat TD_{Lo}: 333 mg/kg (female 1-18 Days pregnant) Effects on fertility – Post implantation mortality	Intraperitoneal Mouse TD_{Lo}: 34,356 ug/kg; (female 10 Days pregnant) Post-implantation mortality
Mutagenicity:	Human DNA Inhibition, HeLa cell: 1 umol/Liter/4 hours	Bacteria B Subtilis DNA Repair: 50 mmol/ Liter
Synergistic Products:	None reported	None reported
Target Organs:	Eyes, Skin, Lungs, Blood, Cardiovascular & Central Nervous Systems	Eyes, Skin, Lungs & Central Nervous Systems
Medical Conditions Aggravated By Exposure:	Skin, Respiratory or Heart disorders	Skin or Respiratory disorders

Components:	**Copper Sulfate**
Eye Contact:	No data available
Skin Contact:	No data available
Oral Rat LD_{50}:	300 mg/kg
Dermal Rabbit LD_{50}:	No data available
Inhalation Rat LC_{50}:	No data available
Human Data:	Oral Human TD_{Lo}: 11 mg/kg; Toxic Effects - Gastritis, Gastrointestinal Hypermotility, diarrhea
Other Toxicological Data:	Oral Child TD_{Lo}: 150 mg/kg; Toxic Effects – Kidney, Ureter and Bladder-Changes in tubules (acute renal failure)
Carcinogenicity:	Parenteral Chicken, TD_{Lo}: 10 mg/kg; Tumorigenic – Equivocal tumorigenic agent by RTECS criteria
Teratogenicity:	Subcutaneous Rat TD_{Lo}: 12,768 ug/kg; (male 1 Day prior to mating) paternal effects–Testes, epididymis, sperm duct
Mutagenicity:	Rat DNA damage, Ascites tumor: 500 umol/Liter
Synergistic Products:	None reported
Target Organs:	Eyes, Skin, Mucous membranes, Lungs, Liver, Kidneys & Blood
Medical Conditions Aggravated By Exposure:	Wilson's Disease, Skin, Liver, Kidney & Respiratory disorders

SECTION 12: ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

This product is soluble in water and can affect the pH of water. No specific environmental fate data is available.

ENVIRONMENTAL CONSIDERATIONS:

The aquatic toxicity for this product has not been determined.

SECTION 13: DISPOSAL CONSIDERATIONS

RCRA 40 CFR 261 CLASSIFICATON: Non-RCRA Hazardous Waste (United States)

U.S. EPA WASTE NUMBER/DESCRIPTION: Not Applicable

If this product is disposed of as shipped, it does not meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of a hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D due to toxicity. As a non-RCRA hazardous liquid waste, it should be disposed of in accordance with all local, state, and federal regulations. Consult state or local officials for proper disposal method.

SECTION 14: TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME: **Environmentally hazardous substances, liquid, n.o.s.** (Cupric Sulfate)

Hazard Class: 9 **UN Number:** UN3082 **Packing Group:** III

Primary Label: Class 9 **Subsidiary Label(s):** None Required

Primary/Subsidiary Placards: Class 9

DOT Reportable Quantity (RQ): 10 pounds (Cupric Sulfate) **RQ for Product:** 568 pounds (49.5 gallons)

Marine Pollutant: Yes (Severe Marine Pollutant) Applicable to transport by water & in a bulk packaging.

2012 North American Emergency Response Guidebook No.: **171**

TDG PROPER SHIPPING NAME: **ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.** (Cupric Sulfate)

Hazard Class: 9 **UN Number:** UN3082 **Packing Group:** III

Primary Label: Class 9 **Subsidiary Label(s):** None Required

Primary/Subsidiary Placards: Class 9

TDG Reportable Quantity (RQ): * At least 1 kg

TDG Schedule XII: Not listed

Regulated Limit (RL): ** Not listed **RL for Product:** Not applicable

Other Shipping Information: Note: In a packaging holding 568 pounds, or more, the shipping name must be preceded by: "RQ,". All the hazardous material shipping descriptions, for this product, must be followed by "(Marine Pollutant)".

* Canadian Transportation of Dangerous Goods Regulations (TDGR), Part IX, Table I, Quantities or levels for Immediate Reporting: releases of reportable quantities, RQ, that meet the definition of a "dangerous occurrence" (a threat to life, health, property, or the environment) must be reported to the appropriate authorities as outlined in TDGR 9.13(1) and 9.14(1). ** Reporting to Environment Canada is required for any releases exceeding the regulated limits, RL, of 9.2 materials (primary or secondary). The regulated limits are found in Schedule XIII of the TDGR.

SECTION 15: REGULATORY INFORMATION

COMPONENTS:	**Zinc Sulfate**	**Manganese Sulfate**	**Copper Sulfate**
OSHA Target Organs:	Eyes, Skin, Lungs, Blood, Cardiovascular & Central Nervous Systems	Eyes, Skin, Lungs & Central Nervous Systems	Eyes, Skin, Mucous membranes, Lungs, Liver, Kidneys & Blood
Carcinogenic Potential:			
Regulated by OSHA:	No	No	No
Listed on NTP Report:	No	No	No
Listed by IARC:	No	No	No
IARC Group:	Not applicable	Not applicable	Not applicable
ACGIH Appendix A:	Not listed	Not listed	Not listed
A1 Confirmed Human:	Not applicable	Not applicable	Not applicable
A2 Suspected Human:	Not applicable	Not applicable	Not applicable

U.S. EPA Requirements

Release Reporting

CERCLA (40 CFR 302)

Listed Substance:	Yes	Yes (Manganese Compounds)	Yes
Reportable Quantity:	1, 000 pounds	1 pound	10 pounds (Anhydrous)
Category:	C	Not listed	A
RCRA Waste No.:	Not listed	Not listed	Not listed
Unlisted Substance:	Not applicable	Not applicable	Not applicable
Reportable Quantity:	Not applicable	Not applicable	Not applicable
Characteristic:	Not applicable	Not applicable	Not applicable
RCRA Waste No.:	Not applicable	Not applicable	Not applicable

SECTION 15: REGULATORY INFORMATION (Continued from Page 5)

COMPONENTS:	**Zinc Sulfate**	**Manganese Sulfate**	**Copper Sulfate**
SARA TITLE III			
Section 302 & 303 (40 CFR 355):			
Listed Substance:	Not listed	Not listed	Not listed
Reportable Quantity:	Not applicable	Not applicable	Not applicable
Planning Threshold:	Not applicable	Not applicable	Not applicable
Section 311 & 312 (40 CFR 370):			
Hazard Categories (**product**):	**Fire: N**	**Sudden Release of Pressure: N**	**Reactive: N** **Acute Health: Y** **Chronic Health: N**
Planning threshold:	10,000 pounds	10,000 pounds	10,000 pounds
Section 313 (40 CFR 372):			
Listed Toxic Chemical:	Yes (Zinc Category)	Yes (Manganese Category)	Yes (Copper Category)
Reporting Threshold:	10,000 pounds	10,000 pounds	10,000 pounds
U.S. TSCA Status			
Listed (40 CFR 710):	Yes	Yes	Yes
State Regulations			
State of California: Safe Drinking Water and Toxins Enforcement Act, 1986 (Proposition 65):			
Carcinogen:	No	No	No
Reproductive Toxin:	No	No	No
Other Regulations			
State Right To Know Laws:	None known	None known	MA, NJ, PA

Canadian Regulations

Product Information:

Controlled Product:	**Yes**
WHMIS Hazard Symbols:	**Material Causing Other Toxic Effects**
WHMIS Class & Division:	**D.2B**

Ingredient Information:

IDL Substance:	Yes	Yes	Yes
DSL or NDSL Lists:	DSL	DSL	DSL

SECTION 16: OTHER INFORMATION

EPA Registration number: Not applicable

Approved Product Uses: Used as part of a plant nutrition program.

Special Notes:

This product is not manufactured, or formulated to contain substances, which the State of California has found to cause cancer and/or birth defects or other reproductive harm. However, as containing mined minerals, this product may contain trace (parts per million) or ultra-trace (parts per billion) of elements known to the State of California to cause cancer, birth defects or other reproductive harm.

Special Instructions:

When making dilutions, always add Z-Max to water with adequate mixing to ensure a uniform solution. Do not add this product to hypochlorite bleaches, chlorine sanitizers, or chlorinated cleaners as this can liberate toxic, corrosive Chlorine gas.

SDS Revision Information: Revised Date: 11/19/15

SDS Distributed by: Bio Huma Netics

Prepared By:	Frank S. Pidgeon, EHS Director	**Date Prepared:**	October 21, 2014