BLU-MIN® 10% Lignin Zinc
SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

Manufacturer:
Ultra Yield Micronutrients, Inc.
213 W. Moxee Avenue
P.O. Box 1167,
Moxee, WA 98936
Emergency Telephone: 509-248-4911
24 Hour Emergency Telephone: 800-424-9300 (Chemtrec)

Product name: BLU-MIN® 10% Lignin Zinc

Common name: Zinc Sulfate Monohydrate

Date of SDS Preparation: March 31, 2017.

Product Uses: (1) The fertilizer industry uses lignin zinc as a zinc micronutrient. Sales for agricultural applications may require appropriate registration and labeling.

Trade Names and Synonyms: Lignin zinc sulfate

SECTION 2: HAZARDS IDENTIFICATION

Hazardous Classification

OSHA/HCS status- This material is considered hazardous by the OSHA Hazardous Communication Standard (29 CFR 1910.1200. This sheet provides valuable information in the safe handling and proper use of this material.

NFPA: Health-2 Fire-O Reactivity -0
HMIS: Heath- 2 Flammability- 0 Physical hazards- 0 Suggested PPE- E

GHS Pictogram:

Emergency Overview:

BLU_MIN 10% Lignin is a dark brown solution. Not flammable or explosive, but will decompose in extreme heat to produce toxic sulfur oxide gas and zinc oxide fume. The liquid is relatively non-toxic to humans and poses little immediate hazard to emergency response personnel but is freely soluble in water and can pose a threat to watercourses due to its high concentration of dissolved zinc.

Potential Health Effects:

Potential Acute health effects

Direct contact with eyes may mildly irritate eyes. Dried residues may cause eye nose, and throat irritation. If greatly heated in the presence of air it will generate zinc oxide fumes. Inhalation of zinc oxide fume can cause metal fume fever which is a temporary flu-like ailment.

Ingestion may cause strong stomach cramps and diarrhea and may induce spontaneous vomiting.

Potential Chronic health hazards:

Ingestion may include stomach irritation, abdominal cramps and nausea. Zinc sulfate monohydrate is not considered a carcinogen by OSHA, NTP, IARC, ACGIH or the EU (see Toxicological Information, Section 11).

Potential Environmental Effects: This product is highly water soluble and is toxic to fish and other aquatic life. It can also be toxic to plant life and other terrestrial organisms at elevated concentrations in soils (see Ecological Information, Section 12).

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Approximate Percent by Weight	CAS Number	Occupational Exposure Limits (OELs)	LD_{50}/LC_{50} Species and Route
Zinc Sulfate Monohydrate	24.7%	7733-02-0	OSHA PEL 15 mg/m3 / 5 mg/m3***** ACGIH TLV (see note below) NIOSH REL None established	LD_{50}, oral, rat 1538 mg/kg *$LD_{50, oral, mouse}$ 832 mg/kg*
Magnesium Sulfate	1.3%	7487-88-9	OSHA PEL None Established ACGIH TLV None Established NIOSH REL None Established	LD_{50} mouse, oral >5,000 mg/kg $LD_{50\ rabbit,}$ oral>3,000 mg/kg
Manganese Sulfate	0.4%	7785-87-7	OSHA PEL 5 mg Mn/m3 Ceiling ACGIH TLV 0.02 mg Mn/m3 Respirable NIOSH REL 1 mg Mn/m3 TWA Inhalable 3 mg Mn/m3 STEL	LD_{50}, rat, oral 2,150 mg/kg LD50 mouse, oral 2,330 mg/kg

NOTE: OELs for individual jurisdictions may differ from OSHA PELs. Check with local authorities for the applicable OELs in your jurisdiction. OSHA PEL – All inert or nuisance dusts, whether mineral, inorganic, or organic not listed specifically by substance name in Tables Z-1 or Z-3 of CFR 1910.1000 are covered by the Particulates Not Otherwise Regulated (PNOR) limit of 15 mg/m3 total dust and 5 mg/m3 respirable fraction. ACGIH® TLV® - ACGIH® believes that even biologically inert, insoluble, or poorly soluble particles may have adverse effects and recommends that airborne concentrations should be kept below 3 mg/m3 respirable particles and 10 mg/m3 inhalable particles, until such time as a TLV® is set for a particular substance. While zinc sulfate monohydrate does not completely meet the ACGIH® definition of a Particle Not Otherwise Specified (PNOS) due to its solubility, this is still considered to be a valid guideline for this dust.

OSHA - Occupational Safety and Health Administration; ACGIH - American Conference of Governmental Industrial Hygienists; NIOSH - National Institute for Occupational Safety and Health. OEL – Occupational Exposure Limit, PEL – Permissible Exposure Limit, TLV – Threshold Limit Value,
REL – Recommended Exposure Limit.

Trade Names and Synonyms: Zinc Sulphate Monohydrate, $ZnSO_4H_20$, Hydrated Zinc Sulfate

SECTION 4: FIRST AID MEASURES

Eye Contact: If irritation occurs, cautiously rinse eyes with lukewarm water for 5 minutes. Let the eye(s) water naturally for a few minutes. If irritation persists, obtain medical attention. DO NOT attempt to manually remove anything stuck to the eye.

Skin Contact: Remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with lukewarm gently flowing water and non-abrasive soap for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice. Completely decontaminate clothing, shoes and leather goods before reuse or else discard.

Inhalation: If symptoms are experienced, remove source of contamination or move victim to fresh air. Obtain medical advice.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 2 – 8 oz. (60 – 240 ml) of water. Zinc sulfate is an emetic and may cause vomiting. If vomiting occurs naturally, have victim rinse mouth with water again. Obtain medical advice and bring a copy of this SDS.

SECTION 5: FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Zinc sulfate solution is not considered a fire or explosion hazard.

Extinguishing Media: Use any means of extinction appropriate for the surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam.

Fire Fighting: Toxic fumes of sulfur dioxide may result from combustion. As with any fire, fire fighters should be fully trained and wear full protective clothing including an approved, self-contained breathing apparatus which supplies a positive air pressure within a full face-piece mask. Do not use water directly on material. **Do not allow water run-off to enter sewers or watercourses**.

Flashpoint and Method: Not Applicable.

Upper and Lower Flammable Limit: Not Applicable.

Autoignition Temperature: Not Applicable.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Procedures for Cleanup: Stop release if possible to do so safely. Contain spill, isolate hazard area, and deny entry. Sweep up or vacuum. Place contaminated material in suitable, labeled containers for final disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

Personal Precautions: Gloves and coveralls or other protective clothing are recommended for persons responding to an accidental release (see also Section 8). Close-fitting safety goggles may be necessary in some circumstances to prevent eye contact.

Environmental Precautions: This product can pose a threat to the environment. Contamination of soil and water should be prevented. Keep spillage and runoff from storage areas from entering soil, streams or sewers.

SECTION 7: HANDLING AND STORAGE

Store in cool, dry, well-ventilated area away from incompatible substances. Protect from physical damage. It is good practice to keep container closed when not in use. Avoid generating dust and the release of dust into the workplace. Good housekeeping is important to prevent accumulations of dust. Always practice good personal hygiene. Refrain from eating, drinking, or smoking in work areas. Blu-MIN 10% Lignin Zinc is corrosive to aluminum; therefore, it should not be transported or stored in aluminum containers.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

ACGIH, OSHA, and NIOSH have not developed exposure limits for any components of this product.

Protective Clothing: The hazard potential of this material is low. Where there is large scale use of this material and significant potential for worker contact, rubber gloves and long sleeved work clothes or disposable coveralls may be necessary. Full goggle eye protection should be worn when handling 10% Lignin Zinc.

Ventilation: Use adequate local or general ventilation to maintain the concentrations of aerosol mists well below recommended occupational exposure limits.

Respirators: Where liquid aerosol mists are generated and cannot be controlled to within acceptable levels, use appropriate NIOSH-approved respiratory protection equipment (42 CFR 84 Class N, R or P-95 particulate filters as a minimum.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear to slightly opaque liquid	Auto-ignition Temperature Not applicable	Decomposition temperature Decomposes at 680°C (1256°F)	**Evaporation rate** 5.0 @ 10% solution 4.5 @ saturated solution
Flammability Non Flammable	Flash Point Non-flammable	Initial boiling point/freezing point Loses water at 238°C	Odor: None
Odor Threshold: Not Applicable	Partition coefficient:n-octanol water No data	pH 4.5 @ saturated solution	Relative Density 5.0 @ 10% solution 3.54

Solubility	Upper/Lower flammability	Vapor density	Vapor Pressure:
53.8 g/100 ml at 20 °C 89.5 g/100 ml at 100°C	Non -flammable	Not applicable	Negligible @ 20°C

Vapor Density:	Viscosity:
Not Applicable	Not Applicable

SECTION 10: STABILITY AND REACTIVITY

Reactivity: This material is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Chemical stability: This material is stable and not considered reactive under normal temperatures and pressures. Hazardous polymerization or runaway reactions will not occur.

Other:
Incompatibilities: None have been identified to date. Avoid excessive heating that may lead to decomposition of the material.

Hazardous Decomposition Products: High temperature operations such as oxy-acetylene cutting, electric arc welding or severe overheating will generate zinc oxide fume which, on inhalation in sufficient quantity, can produce metal fume fever. Under such conditions, sulfur dioxide will also be generated and can cause respiratory distress.

SECTION 11: TOXICOLOGICAL INFORMATION

General: In the form in which this product is sold it is relatively non-toxic. The major route of exposure would be through the generation and inhalation of airborne dust and especially the generation of zinc oxide fume through thermal decomposition.

Acute:
Skin/Eye: Direct contact may cause local irritation of the eyes or skin but would not cause tissue damage. Eye contact with solutions (>1%) may cause the appearance of white flecks on the lens of the eye. Dust or fume from burning or welding operations may also cause local irritation. , Dermal Rat LD50>2,000 mg $ZnSO_4$/kg/bw.

Inhalation: Acute inhalation may result in irritation but is not expected to cause significant harmful effects. Symptoms may include discomfort, coughing, tingling sensation, sneezing and/or shortness of breath and wheezing. Extreme heating of zinc sulfate monohydrate will generate zinc oxide fume. If inhaled, this fume can result in the condition called metal fume fever. The symptoms of metal fume fever will occur within 3 to 10 hours of exposure, and include immediate dryness and irritation of the throat, tightness of the chest, and coughing which may later be followed by flu-like symptoms of fever, malaise, perspiration, frontal headache, muscle cramps, low back pain, occasionally blurred vision, nausea, and vomiting. The symptoms are temporary and generally disappear, without medical intervention, within 24 to 48 hours of onset. There are no recognized complications, after affects, or chronic affects that result from this condition.

Ingestion: Ingestion of large doses can cause anemia and stomach symptoms. Zinc sulfate is very astringent, and when ingested in excessive quantities, can irritate the stomach, resulting in abdominal pain, nausea, diarrhea and spontaneous vomiting. Oral LD50 rat, oral 1,538 mg/kg/kg/bw.

Chronic: In general, zinc is considered to be a low toxicity metal. Zinc is a very important trace element for humans and the body regulates the amount of zinc stored by decreasing absorption and increasing excretion when intake is increased. Industrial experience has not identified any significant chronic effects from zinc sulfate to date. Zinc sulfate is not listed as a carcinogen by the Occupational Safety and Health Administration (OSHA), the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH) or the European Union (EU).

SECTION 12: ECOLOGICAL INFORMATION

This product has high water solubility and its zinc contents are directly bioavailable. The zinc in particular may be toxic to aquatic organisms, especially fish, with water hardness, pH and dissolved organic carbon levels being regulating factors. In terrestrial systems, the mobility of zinc in soil and its degree of bioaccumulation in organisms is dependent on soil chemical conditions.

SECTION 13: DISPOSAL CONSIDERATIONS

Do not wash down drain. Put uncontaminated material back into the process if at all possible. Place contaminated material in suitable, labeled containers for disposal. Dispose of waste material consistent with the requirements of waste disposal authorities.

SECTION 14: TRANSPORT INFORMATION

TRANSPORT CANADA CLASSIFICATION	Not regulated
US DOT HAZARD CLASSIFICATION	Class 9, Packing Group III (RQ) (Regulated only if transported in containers containing 1,000 (RQ) or more lbs. of zinc sulfate.)
SHIPPING NAME U.S. DOT	Environmentally Hazardous Substance, Solid, n.o.s. (contains Zinc Sulfate)
DOT REPORTABLE QUANTITY	1000 lbs. per container
US DOT PRODUCT IDENTIFICATION NUMBER	UN3082
MARINE POLLUTANT (U.S.)	No
IMO CLASSIFICATION	Not regulated

SECTION 15: REGULATORY INFORMATION

U.S.

INGREDIENTS LISTED ON TSCA INVENTORY	Yes
HAZARDOUS UNDER HAZARD COMMUNICATION STANDARD	No Ingredients Qualify
CERCLA SECTION 103 HAZARDOUS SUBSTANCES	Zinc Sulfate..... RQ: 1,000lbs. Manganese Compounds. RQ None Assigned
EPCRA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE	No Ingredients Qualify
EPCRA SECTION 311/312 HAZARD CATEGORIES	No Hazard Categories Apply
EPCRA SECTION 313 TOXIC RELEASE INVENTORY	Zinc Compounds (Zinc Sulfate) CAS No. 7446-19-7 Percent by Weight..... 92% Manganese Compounds (Manganese Sulfate) CAS No. 7785-87-7 Percent by Weight……0.3-0.5%

CANADIAN:

INGREDIENTS LISTED ON DSL	Yes
WHMIS CLASSIFICATION:	Not a Controlled Product

SECTION 16: OTHER INFORMATION

The information in this Safety Data Sheet is based on the following references:

-American Conference of Governmental Industrial Hygienists, 2004, Documentation of the Threshold Limit Values and Biological Exposure Indices, Seventh Edition plus updates
-American Conference of Governmental Industrial Hygienists, 2005, Guide to Occupational Exposure Values.
-American Conference of Governmental Industrial Hygienists, 2006, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices
-American Conference of Governmental Industrial Hygienists, 2010, Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.
-- Bretherick's Handbook of Reactive Chemical Hazards, 20th Anniversary Edition. (P. G. Urben ed.) 1995.
- Canadian Centre for Occupational Health and Safety (CCOHS) CHEMpendium Chemical Information Data Base, 2010.
- Commission de la santé et la sécurité du travail, Service du répertoire toxicologique, Sulfate de zinc monohydrate, 1994-05.
- European Economic Community, Commission Directives 91/155/EEC and 67/548/EEC and 88/379/EEC.
- Industry Canada, SOR/88-66, Controlled Products Regulations, as amended.
- International Agency for Research on Cancer (IARC), Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, 1972 – 2004, (multi-volume work), World Health Organization, Geneva.
- International Chemical Safety Cards (WHO/IPCS/ILO), ICSC:0349–Zinc Sulphate Heptahydrate (Revised Oct 2001).

- Merck & Co., Inc., 2001, The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Thirteenth Edition.
- National Library of Medicine, National Toxicology Information Program, Hazardous Substance Data Bank. (on-line version).
- Patty's Toxicology, 5th Edition, (E Bingham, B Cohrssen & C H Powell, ed.) 2001.
- Sax, N. Irving, 1989, Dangerous Properties of Industrial Materials, Seventh Edition.
- Sax, N. Irving & Lewis, Richard J., Sr., 1987, Hawley's Condensed Chemical Dictionary, Eleventh Edition.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, NIOSH Pocket Guide to Chemical Hazards. CD-ROM Edition, September 2005.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, National Toxicology Program (NTP), 11th Report on Carcinogens, January 2005.
- U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, Registry of Toxic Effects of
Chemical Substances (RTECS) Jan 2004.
- U.S. Occupational Safety and Health Administration, 1989, Code of Federal Regulations, Title 29, Part 1910.
-European Union Risk Assessment Report – Zinc Sulfate CAS No. 7733-02-0 EINECS No. 231-793-3.

Notice to Reader

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