

Safety Data Sheet



Section 1: Identification

Product identifier

Product Name

- Tiger Micronutrients Corn® Mix II + B

Synonyms

- Tiger Corn Mix II Sulphur (S), Zinc Oxide (ZnO), Boron (B)

Relevant identified uses of the substance or mixture and uses advised against

Recommended use

- Granular Micronutrient Fertilizer

Details of the supplier of the safety data sheet

Manufacturer

- Tiger-Sul Products, LLC

Post Office Box 5
Atmore, AL 36502
United States
www.tigersul.com

Telephone (General) • 251-202-3850

Emergency telephone number

Manufacturer

- 251-202-3850

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012

- Flammable Solids 1 - H228
- Eye Irritation 2 - H319
- Reproductive Toxicity 2 - H361

Label elements

OSHA HCS 2012

DANGER



- Hazard statements** • Flammable solid - H228
Causes serious eye irritation - H319
Suspected of damaging fertility or the unborn child. - H361

Precautionary statements

- Prevention**
 - Obtain special instructions before use. - P201
 - Do not handle until all safety precautions have been read and understood. - P202
 - Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210
 - Ground and/or bond container and receiving equipment. - P240
 - Use explosion-proof electrical/ventilating/lighting/equipment. - P241
 - Wash thoroughly after handling. - P264
- Response**
 - In case of fire: Use appropriate media for extinction. - P370+P378
 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. - P305+P351+P338
 - If eye irritation persists: Get medical advice/attention. - P337+P313
 - IF exposed or concerned: Get medical advice/attention. - P308+P313
- Storage/Disposal**
 - Store in an appropriate fertilizer facility.
 - Dispose of container in accordance with local, regional, national, and/or international regulations.

Other hazards**OSHA HCS 2012**

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

Classification of the substance or mixture**WHMIS**

- Other Toxic Effects - D2A
- Other Toxic Effects - D2B
- Flammable Solids - B4

Label elements**WHMIS**

- Flammable Solids - B4
- Other Toxic Effects - D2A
- Other Toxic Effects - D2B

Other hazards**WHMIS**

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients**Substances**

- Material does not meet the criteria of a substance.

Mixtures

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive	Comments

Sulfur	CAS:7704-34-9	70% TO 74%	NDA	OSHA HCS 2012: Flam. Sol. 1; STOT SE 3: Resp. Irrit.; STOT RE 1 (Kidneys, Lung, Liver)	NDA
Zinc oxide	CAS:1314-13-2	8% TO 12%	NDA	OSHA HCS 2012: Eye Irrit. 2	NDA
Bentonite	CAS:1302-78-9	7.64% TO 11.76%	NDA	OSHA HCS 2012: STOT RE 2 (Lungs, Inhl)	NDA
Inert Ingredients	NDA	6% TO 8%	NDA	OSHA HCS 2012: Not Classified	NDA
Sodium tetraborate	CAS:1330-43-4	0.8% TO 1.2%	Ingestion/Oral-Rat LD50 • 1200 mg/kg	OSHA HCS 2012: Acute Tox. 4 (orl); Repr. 2	NDA

Section 4: First-Aid Measures

Description of first aid measures

Inhalation

- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Get medical attention.

Skin

- Wash skin with soap and water. If skin irritation occurs: Get medical advice/attention.

Eye

- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Do not rub eyes. Seek medical attention if irritation persists longer than 30 minutes.

Ingestion

- Irritation may occur, seek medical attention.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media

- LARGE FIRE: Water spray, fog or regular foam.
SMALL FIRES: Dry chemical, CO₂, sand, earth, water spray or regular foam.

Unsuitable Extinguishing Media

- Hoses and extinguishers with pressure streams should be avoided solid sulphur is dusty or where it may create a further hazard by raising more dust clouds.

Firefighting Procedures

- Because burning sulphur evolves sulphur dioxide, breather apparatus or gas masks approved for use in acid-gas atmosphere should be used.

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards

- Flammable/combustible material.
May be ignited by friction, heat, sparks or flames.
Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.

Hazardous Combustion Products

- No data available

Advice for firefighters

- Structural firefighters' protective clothing will only provide limited protection. Wear positive pressure self-contained breathing apparatus (SCBA).

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- Ventilate enclosed areas. Wear appropriate personal protective equipment. Do not breathe dust. Avoid contact with skin and eyes.
- Emergency Procedures**
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

- Containment/Clean-up Measures**
- Avoid generating dust.
SMALL DRY SPILLS: With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

Section 7 - Handling and Storage

Precautions for safe handling

- Handling**
- Keep away from heat, sparks, and flame. Use only with adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact. Do not breathe dust. Avoid contact with skin and eyes. Do not take internally. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. Good housekeeping is necessary when handling sulphur based products. Tiger-Sul Products uses a special anti-dust agent to minimize air borne dust. Always use stringent dust control procedures to prevent concentrated flammable dusts from reaching a spark or flame source. Sulphur based materials should not be blended with strong oxidizing agents such as ammonium nitrate. Avoid extensive use of augers due to fracturing of the product. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

Conditions for safe storage, including any incompatibilities

- Storage**
- Keep away from sources of ignition - No Smoking. Keep out of reach of children. Store in a cool, dry, well-ventilated place. Sulphur based materials should not be stored with strong oxidizing agents such as ammonium nitrate.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines				
	Result	ACGIH	NIOSH	OSHA
Sodium tetraborate (1330-43-4)	STELs	6 mg/m3 STEL (inhalable fraction, listed under Borate compounds, inorganic)	Not established	Not established
	TWAs	2 mg/m3 TWA (inhalable fraction, listed under Borate compounds, inorganic)	1 mg/m3 TWA	Not established
Zinc oxide (1314-13-2)	TWAs	2 mg/m3 TWA (respirable fraction)	5 mg/m3 TWA (dust and fume)	5 mg/m3 TWA (fume); 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
	STELs	10 mg/m3 STEL (respirable fraction)	10 mg/m3 STEL (fume)	Not established
	Ceilings	Not established	15 mg/m3 Ceiling (dust)	Not established

Exposure controls

- Engineering Measures/Controls**
- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable

level. It is recommended that dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment.

Personal Protective Equipment

Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134. Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear safety glasses.

Skin/Body

- Wear appropriate gloves.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways. Follow best practice for site management and disposal of waste.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

OSHA = Occupational Safety and Health Administration

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Gray pastilles with no odor.
Color	Gray	Odor	Odorless
Particulate Size	2.5 mm	Odor Threshold	No data available
General Properties			
Boiling Point	444 C(831.2 F)	Melting Point	119 C(246.2 F)
Decomposition Temperature	No data available	pH	Not relevant
Specific Gravity/Relative Density	2.07 Water=1	Bulk Density	77 lb(s)/ft ³
Water Solubility	Negligible < 0.1 %	Viscosity	No data available
Explosive Properties	No data available	Oxidizing Properties:	No data available
Volatility			
Vapor Pressure	> 0.0001 mmHg (torr) @ 20 C(68 F)	Vapor Density	> 1 Air=1
Evaporation Rate	No data available		
Flammability			
Flash Point	188 C(370.4 F)	UEL	Not relevant
LEL	Not relevant	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- No dangerous reaction known under conditions of normal use.

Chemical stability

- Stable under normal temperatures and pressures.

Possibility of hazardous reactions

- No data available

Conditions to avoid

- Keep away from heat, sparks and flame. Incompatible materials. Avoid generating dust.

Incompatible materials

- Strong oxidizing agents.

Hazardous decomposition products

- No data available

Section 11 - Toxicological Information

Information on toxicological effects

Components		
Sulfur (70% TO 74%)	7704-34-9	<p>Acute Toxicity: Inhalation-Mammal LC50 • 1660 mg/m³;</p> <p>Irritation: Eye-Human • 8 ppm;</p> <p>Multi-dose Toxicity: Inhalation-Rat TCLo • 1.76 mg/m³ 4 Hour(s) 30 Day(s)-Intermittent; <i>Liver:Hepatitis (hepatocellular necrosis), diffuse; Kidney, Ureter, and Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis)</i>; Inhalation-Rat TCLo • 12.68 mg/m³ 4 Hour(s) 15 Day(s)-Intermittent; <i>Liver:Hepatitis (hepatocellular necrosis), diffuse; Kidney, Ureter, and Bladder:Changes in tubules (including acute renal failure, acute tubular necrosis)</i></p>
Zinc oxide (8% TO 12%)	1314-13-2	<p>Acute Toxicity: Ingestion/Oral-Mouse LD50 • 7950 mg/kg;</p> <p>Irritation: Skin-Rabbit • 500 mg 24 Hour(s) • Mild irritation;</p> <p>Multi-dose Toxicity: Inhalation-Rat TCLo • 6.9 mg/m³ 7 Day(s)-Intermittent; <i>Lungs, Thorax, or Respiration:Other changes; Lungs, Thorax, or Respiration:Changes in lung weight; Biochemical:Enzyme inhibition, induction, or change in blood or tissue levels:Multiple enzyme effects;</i></p> <p>Reproductive: Ingestion/Oral-Rat TDLo • 6846 mg/kg (1-22D preg); <i>Reproductive Effects:Specific Developmental Abnormalities:Homeostasis; Reproductive Effects:Effects on Newborn:Stillbirth; Reproductive Effects:Effects on Newborn:Growth statistics (e.g., reduced weight gain)</i></p>
Sodium tetraborate (0.8% TO 1.2%)	1330-43-4	<p>Acute Toxicity: Ingestion/Oral-Rat LD50 • 1200 mg/kg;</p> <p>Multi-dose Toxicity: Ingestion/Oral-Rabbit TDLo • 22680 mg/kg 12 Week(s)-Intermittent; <i>Blood:Leukopenia; Blood:Changes in serum composition (e.g., TP, bilirubin cholesterol); Blood:Changes in erythrocyte (RBC) count;</i></p> <p>Reproductive: Ingestion/Oral-Rat TDLo • 16750 µg/kg (30D male); <i>Reproductive Effects:Paternal Effects:Testes, epididymis, sperm duct; Reproductive Effects:Paternal Effects:Prostate, seminal vesicle, Cowper's gland, accessory glands</i></p>

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • No data available
Aspiration Hazard	OSHA HCS 2012 • No data available
Carcinogenicity	OSHA HCS 2012 • No data available
Germ Cell Mutagenicity	OSHA HCS 2012 • No data available
Skin corrosion/Irritation	OSHA HCS 2012 • No data available
Skin sensitization	OSHA HCS 2012 • No data available
STOT-RE	OSHA HCS 2012 • No data available
STOT-SE	OSHA HCS 2012 • No data available
Toxicity for Reproduction	OSHA HCS 2012 • Toxic to Reproduction 2
Respiratory sensitization	OSHA HCS 2012 • No data available
Serious eye damage/Irritation	OSHA HCS 2012 • Eye Irritation 2

Route(s) of entry/exposure

- Inhalation, Skin, Eye, Ingestion

Medical Conditions Aggravated by Exposure

- Disorders of the lungs.

Potential Health Effects

Inhalation

Acute (Immediate)

- Exposure to dust may cause irritation. Processes such as cutting, grinding, crushing, or impact may result in generation of excessive amounts of airborne dusts in the workplace. Nuisance dust may affect the lungs but reactions are typically reversible.

Chronic (Delayed)

- Tiger-Sul Products uses a special anti-dust agent to minimize air borne dust. This product contains crystalline silica that can cause lung damage - fibrosis and silicosis upon repeated and prolonged inhalation.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available.

Eye

Acute (Immediate)

- May cause irritation.

Chronic (Delayed)

- No data available.

Ingestion

Acute (Immediate)

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)

- No data available.

Carcinogenic Effects

- Tiger-Sul Products uses a special anti-dust agent to minimize air borne dust. Repeated and prolonged inhalation of respirable sized crystalline silica particles may cause cancer.

Reproductive Effects

- Animal ingestion studies in several species at high doses indicate that borates cause reproductive and developmental effects. A human study of occupational exposure to borate dust showed no adverse effect on reproduction.

Key to abbreviations

LC = Lethal Concentration

TC = Toxic Concentration

Section 12 - Ecological Information

Toxicity

- Non-mandatory section - information about this substance not complied for this reason.

Persistence and degradability

- Non-mandatory section - information about this substance not complied for this reason.

Bioaccumulative potential

- Non-mandatory section - information about this substance not complied for this reason.

Mobility in Soil

- Non-mandatory section - information about this substance not complied for this reason.

Other adverse effects

- Non-mandatory section - information about this substance not complied for this reason.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste

- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class (es)	Packing group	Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

Special precautions for user • None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code • No data available

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications • Acute, Chronic, Fire

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
Bentonite	1302-78-9	Yes	No	Yes	No	Yes
Sodium tetraborate	1330-43-4	Yes	No	Yes	No	Yes
Sulfur	7704-34-9	Yes	No	Yes	No	Yes
Zinc oxide	1314-13-2	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Uncontrolled product according to WHMIS classification criteria
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	B4
• Bentonite	1302-78-9	D2A

Canada - WHMIS - Ingredient Disclosure List

• Sodium tetraborate	1330-43-4	1 %
• Zinc oxide	1314-13-2	1 %
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed

• Bentonite	1302-78-9	Not Listed
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Environment**Canada - CEPA - Priority Substances List**

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

United States**Labor****U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals**

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

Environment**U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants**

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed

• Bentonite	1302-78-9	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		1.0 % de minimis concentration (Chemical Category N982)
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Sodium tetraborate	1330-43-4	Not Listed
• Zinc oxide	1314-13-2	Not Listed
• Zinc oxide as Zinc compounds		Not Listed
• Sulfur	7704-34-9	Not Listed
• Bentonite	1302-78-9	Not Listed

Section 16 - Other Information**Last Revision Date**

- 15/September/2014

Preparation Date

- 15/September/2014

Disclaimer/Statement of Liability

- The information contained in this SDS is based upon tests, research, and reports believed to be credible; no guarantee is made as to its accuracy or completeness. The management of handling, storage, disposal, and the determination of product suitability for particular uses are beyond our control. This information is presented to the customer for his/her consideration, investigation, and verification. Therefore, the user assumes all risks involving the use of the product. We disclaim all warranties express or implied, including merchantability and fitness for a particular purpose.

Key to abbreviations

NDA = No Data Available