SAFETY DATA SHEET

1. CHEMICAL IDENTIFICATION AND COMPANY INFORMATION

PRODUCT NAME: Murashige & Skoog Basal Medium w/ Vitamins
PRODUCT NUMBER: M519
COMPANY INFO: PhytoTechnology Laboratories®
PO Box 12205, Shawnee, KS 66282-2205
Phone: 1-888-749-8682 or 1-913-341-5343; Fax: 1-888-449-8682 or 1-913-341-5442
www.phytotechlab.com

EMERGENCY PHONE NUMBER (INFOTRAC): 1-800-535-5053 - US Only
1-352-323-3500 - International

RECOMMENDED USE: For Research Use Only

RESTRICTIONS ON USE: Products sold by PhytoTechnology Laboratories® are intended for research and laboratory use only. Products are not to be used as human or animal therapeutics, cosmetics, agricultural or pesticidal products, food additives, or as household chemicals.

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification:
- H272 – Oxidizing solids (Category 3)
- H315 – Skin irritation (Category 2)
- H319 – Eye irritation (Category 2A)
- H335 – Specific target organ toxicity – single exposure – Respiratory system (Category 3)

GHS Label elements, including hazard and precautionary statements:

Pictogram: ! P210 - Keep away from heat
Signal Word: Warning
P220 - Store away from combustible materials
P221 - Take any precaution to avoid mixing with combustibles.
P261 - Avoid breathing dust
P280 - Wear protective clothing/protective gloves/eye protection.
P302 + P352 + IF ON SKIN: Wash with plenty of soap and water
P304 + P340 + P312: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get Medical attention if you feel unwell
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Hazard Statements:
- H272 – May intensify fire; oxidizer.
- H315 – Causes skin irritation.
- H319 – Causes serious eye irritation.
- H335 – May cause respiratory irritation.

Precautionary Statements:

Hazards not otherwise classified (HNOC) or not covered by GHS: - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: MS Basal Medium
This product is a mixture that contains, but is not limited to, the following components that may cause harm to the user or environment or may be suspected to do so:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Nitrate</td>
<td>6484-52-2</td>
<td>37.25%</td>
<td>No exposure limits established by OSHA or ACGIH</td>
</tr>
<tr>
<td>Potassium Nitrate</td>
<td>7757-79-1</td>
<td>42.89%</td>
<td>No exposure limits established by OSHA or ACGIH</td>
</tr>
<tr>
<td>EDTA, Disodium Salt, Dihydrate</td>
<td>6381-92-6</td>
<td>0.84%</td>
<td>No exposure limits established by OSHA or ACGIH</td>
</tr>
<tr>
<td>Ferrous Sulfate, Heptahydrate</td>
<td>7782-63-0</td>
<td>0.63 %</td>
<td>ACGIH TLV: 1 mg (Fe)/m³</td>
</tr>
<tr>
<td>Cobalt Chloride, Hexahydrate</td>
<td>7791-13-1</td>
<td>0.0006%</td>
<td>ACGIH TLV: 0.02 mg (Co)/m³</td>
</tr>
<tr>
<td>Cupric Sulfate, Pentahydrate</td>
<td>7758-99-8</td>
<td>0.0006%</td>
<td>NIOSH REL: 1 mg/m³</td>
</tr>
<tr>
<td>Sodium Molybdate(VI), Dihydrate</td>
<td>10102-40-6</td>
<td>0.006%</td>
<td>OSHA PEL: 5 mg(Mo)/m³; ACGIH TLV: 0.5 mg(Mo)/m³</td>
</tr>
<tr>
<td>Manganese Sulfate, Monohydrate</td>
<td>10034-96-5</td>
<td>0.38%</td>
<td>OSHA PEL: 5 mg (Mn)/m³; ACGIH TLV: 0.2 mg (Mn)/m³</td>
</tr>
<tr>
<td>Potassium Iodide</td>
<td>7681-11-0</td>
<td>0.019%</td>
<td>ACGIH TLV: 0.01 mg/m³</td>
</tr>
<tr>
<td>Boric Acid</td>
<td>10043-35-3</td>
<td>0.14%</td>
<td>ACGIH TLV: 2 mg/m³</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

Route of Entry  | Symptoms                                      | First Aid Procedures                                      |
---------------|-----------------------------------------------|------------------------------------------------------------|
Ingestion      | May cause irritation if swallowed             | If swallowed, wash out mouth with water. Never give anything by mouth to an unconscious person. **Get medical attention.** |
Inhalation     | May cause irritation to respiratory tract     | Safely remove victim to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. **Get medical attention.** |
Eye Contact    | Direct contact may cause irritation.          | Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. **Get medical attention if irritation persists.** |
               | May cause redness, tearing, or blurred vision.|                                                           |
Skin Contact   | Irritating. May cause reddening, itching or inflammation.| Wash area thoroughly with soap and water. Remove and wash contaminated clothing. **Get medical attention if irritation persists.** |

Most Important Symptoms or Effects, Both Acute and Delayed:

See section 2 and/or section 11

Recommendation for Immediate Medical Care and Special Treatment Needed:

No data available

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Water spray, carbon dioxide, dry chemical powder, or alcohol-resistant foam. Use extinguishing media suitable for surrounding fire.

Special Protective Equipment and Precaution for Firefighters: In the event of a fire, wear full protective clothing and NIOSH approved self-contained breathing apparatus. Evacuate the area and fight fire from a safe distance.

Hazardous Combustion Products: No data available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures:

Use personal protection recommended in Section 8. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation, especially in confined areas. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Method of Containment and Cleanup: Wear suitable protective clothing. Avoid dust formation. Carefully sweep up and remove. Place material in a dry container and cover. Remove from the area. Flush spill area with water. Do not let products enter drains.

7. HANDLING AND STORAGE
Precaution for Safe Handling: Avoid contact with skin and eyes. Avoid dust formation and aerosols. Avoid incompatible substances. Keep away from combustible materials. Wash thoroughly after use.
Conditions for Safe Storage: Keep in a tightly closed container and store in a cool, dry, and well-ventilated area. Protect from moisture.
Incompatibilities: No data available
Recommended Storage Temperature: 2 to 6 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
OSHA’s Permissible Exposure Limits (PELs): Manganese Sulfate, Monohydrate: 5 mg (Mn)/m³
Sodium Molybdate(VI), Dihydrate: 5 mg (Mo)/m³
ACGIH Threshold Limit Values (TLVs): Sodium Molybdate(VI), Dihydrate: 0.5 mg (Mo)/m³
Ferrous Sulfate, Heptahydrate: 1 mg (Fe)/m³
Cobalt Chloride, Hexahydrate: 0.02 mg (Co)/m³
Manganese Sulfate, Monohydrate: 0.2 mg (Mn)/m³
Potassium Iodide: 0.01 mg/m³
Boric Acid: 2 mg/m³

Engineering Controls: Handle in accordance to general industrial hygiene and safety practice.

Personal Protective Equipment (PPE):
Eye/Face Protection: Chemical safety glasses or goggles. Have eye-washing facilities readily available where eye contact can occur.
Skin Protection: Protective gloves
Body Protection: Lab coat
Respiratory Protection: Respiratory protection is not required. Use N95 (US) or type P1 (EN 143) dust mask where dust level is nuisance. A NIOSH/MSHA approved air purifying respirator is recommended where airborne concentrations are expected to exceed exposure limits. Protection provided by purifying respirators is limited.

9. PHYSICAL AND CHEMICAL PROPERTIES
Appearance: Off-White to yellow fine powder
pH (4.43 g/L): 3.5 – 4.5
Solubility: Soluble in Water
Melting Range: No data available
Vapor Density: No data available
Vapor Pressure: No data available
Specific Gravity: No data available
Odor: Odorless
Odor Threshold: No data available
Viscosity: No data available
Relative Density: No data available
Evaporation Rate: No data available
Initial Boiling Point and Boiling Range: No data available
Flammability (solid, gas): No data available
Partition coefficient:  n-octanol/water:  No data available
Auto-ignition Temperature:  No data available
Decomposition Temperature:  No data available
Flash Point (Closed Cup):  No data available
Flammable Limits:  Upper (%) – No data available  Lower (%) – No data available

10. STABILITY AND REACTIVITY
Reactivity:  No data available
Chemical Stability:  Stable under normal conditions of use
 Possibility of Hazard Reactions:  No data available.
 Conditions to Avoid:  No data available.
 Incompatibles Materials:  Strong reducing agents, strong acid, finely powered metals
 Hazardous Decomposition Products:  Carbon oxides, Nitrogen oxides (NOx), Sulphur oxides, Hydrogen chloride gas, Potassium oxides, Sodium oxides, Cobalt/cobalt oxides, Molybdenum oxides, Copper oxides

11. TOXICOLOGICAL INFORMATION
Toxicity:  LD$_{50}$ (Oral-Rat)(mg/Kg):  No data available
 LD$_{50}$ (Oral-Mouse)(mg/Kg):  No data available
 LD$_{50}$ (Dermal-Rabbit)(mg/Kg):  No data available
 Carcinogenicity:  NTP:  No
 IARC:  No
 OSHA Reg:  No
 Reproductive Toxicity:  No data available
 Specific Target Organ Toxicity:  Single Exposure:  No data available
 Repeated Exposure:  No data available
 Target Organs:  No data available
 Routes of Entry:  Ingestion, inhalation, skin and eye contact
 NIOSH/RTECS NO:  Not listed

The toxicological properties of this product have not been thoroughly investigated

12. ECOLOGICAL INFORMATION
Ecotoxicity:  No data available
Persistence and Degradability:  No data available
Bioaccumulative Potential:  No data available
Mobility in Soil:  No data available
Other Adverse Effects:  No data available

13. DISPOSAL CONSIDERATION
Disposal Procedure:  Dispose in accordance with all applicable federal, state, and local environmental regulations.

14. TRANSPORT INFORMATION
Domestic (D.O.T.):

Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)
Hazard Class: N/A
UN/NA: N/A
Labels: N/A

International:

IMDG:
Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)
Hazard Class: N/A
UN/NA: N/A
Labels: N/A

IATA:
Proper Shipping Name: CHEMICALS, N.O.S. (NON-REGULATED)
Hazard Class: N/A
UN/NA: N/A
Labels: N/A

15. REGULATORY INFORMATION

TSCA:
No

SARA TITLE III:

Section 302 (EHS) Ingredients: No
Section 313 Ingredients:

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Section 304 (EHS/CERCLA) Ingredients: No

Section 311/312 Hazard: Acute Health Hazard, Chronic Health Hazard, Reactivity Hazard

California Proposition 65 List:
None of the components in this product are known to cause cancer or reproductive toxicity

Massachusetts Right To Know Components:

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New Jersey Right to Know Components:

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16. OTHER INFORMATION

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<tr>
<th>HMIS Rating:</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Physical Hazard</th>
<th>Personal Protection</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>B</td>
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</tbody>
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<table>
<thead>
<tr>
<th>NFPA Rating:</th>
<th>Health Hazard</th>
<th>Fire Hazard</th>
<th>Instability</th>
<th>Special Hazard</th>
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<tbody>
<tr>
<td></td>
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