1 Identification

- **Product identifier**
  - **Trade name:** Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin
  - **Article number:** 26100
  - **Application of the substance / the mixture** For Research Use Only

- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier:** MP Biomedicals, LLC
    29525 Fountain Parkway
    Solon, OH 44139
    United States
    www.mpbio.com
  - **Information department:** Quality Control Department

2 Hazard(s) identification

- **Classification of the substance or mixture**
  - GHS03 Flame over circle
    Ox. Sol. 2  H272 May intensify fire; oxidizer.

  - GHS08 Health hazard
    Repr. 1  H360 May damage fertility or the unborn child.

  - GHS07
    Skin Irrit. 2  H315 Causes skin irritation.
    Eye Irrit. 2A  H319 Causes serious eye irritation.
    STOT SE 3  H335 May cause respiratory irritation.

- **Label elements**
  - **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
  - **Hazard pictograms**
    - GHS03
    - GHS07
    - GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - Ammonium Nitrate

- **Hazard statements**
  - May intensify fire; oxidizer.
  - Causes skin irritation.
  - Causes serious eye irritation.
  - May damage fertility or the unborn child.
  - May cause respiratory irritation.

(Contd. on page 2)
Precautionary statements

Take any precaution to avoid mixing with combustibles.
Wear protective gloves / eye protection / face protection.
Keep away from heat.
Keep/Store away from clothing/combustible materials.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Specific treatment (see on this label).
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/attention. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. In case of fire: Use for extinction: CO2, powder or water spray.
IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. Store locked up.
Store in a well-ventilated place. Keep container tightly closed.
Dispose of contents/container in accordance with local/regional/national/international regulations.

Classification system:

NFPA ratings (scale 0 - 4)

Health = 3
Fire = 3
Reactivity = 0

The substance possesses oxidizing properties.

HMIS-ratings (scale 0 - 4)

Health = 3
Fire = 3
Reactivity = 0

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

Composition/information on ingredients

Chemical characterization: Mixtures

Description:
Mixture of substances listed below with nonhazardous additions.
Mixture: consisting of the following components.
Trade name: Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin

- Dangerous components:

<table>
<thead>
<tr>
<th>CAS:</th>
<th>EINECS:</th>
<th>RTECS:</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7757-79-1</td>
<td>231-818-8</td>
<td>TT 3700000</td>
<td></td>
</tr>
<tr>
<td>EINECS:</td>
<td></td>
<td></td>
<td>Potassium Nitrate 25-50%</td>
</tr>
<tr>
<td>6484-52-2</td>
<td>229-347-8</td>
<td>BR9050000</td>
<td></td>
</tr>
<tr>
<td>EINECS:</td>
<td></td>
<td></td>
<td>Ammonium Nitrate 25-50%</td>
</tr>
<tr>
<td>10043-52-4</td>
<td>233-140-8</td>
<td>EV 9800000</td>
<td></td>
</tr>
<tr>
<td>EINECS:</td>
<td></td>
<td></td>
<td>Calcium Chloride 2.5-&lt;10%</td>
</tr>
<tr>
<td>10043-35-3</td>
<td>233-139-2</td>
<td>ED4550000</td>
<td></td>
</tr>
<tr>
<td>EINECS:</td>
<td></td>
<td></td>
<td>Boric Acid 0.1-1%</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
- General information: Consult your Doctor. Show the safety data sheet to the Doctor. Away from the dangerous area.
- After inhalation: If breathed in, supply fresh air. If not breathing, give artificial respiration. Consult a Doctor.
- After skin contact: Wash off with soap and plenty of water. Consult a Doctor.
- After eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing: If symptoms persist consult doctor.
- Information for doctor:
  - Most important symptoms and effects, both acute and delayed No further relevant information available.
  - Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- Suitable extinguishing agents: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture No further relevant information available.
- Advice for firefighters
- Protective equipment: No special measures required.

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
  For personal protection see section 8.
- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:
  Pick up mechanically, dispose contaminated material as waste according to Section 13. Ensure adequate ventilation.
- Reference to other sections
  See Section 7 for information on safe handling.
7 Handling and storage

· Handling:
· Precautions for safe handling
  Ensure good ventilation/exhaustion at the workplace. Avoid direct contact with skin and eyes.
  Open and handle receptacle with care.
· Information about protection against explosions and fires: Keep respiratory protective device available.
· Conditions for safe storage, including any incompatibilities
· Storage: 2 - 8 °C
· Requirements to be met by storerooms and receptacles: No special requirements.
· Further information about storage conditions:
  Protect from humidity and water.
  Keep container tightly sealed.
· Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see Section 7.
· Control parameters
· Components with limit values that require monitoring at the workplace:
  The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
  At this time, the other constituents have no known exposure limits.
  10043-35-3 Boric Acid
  TLV
  Short-term value: 6* mg/m³
  Long-term value: 2* mg/m³
  *as inhalable fraction

· Additional information: The lists that were valid during the creation were used as basis.
· Exposure controls
· Personal protective equipment:
· General protective and hygienic measures:
  Keep away from foodstuffs, beverages and feed.
  Immediately remove all soiled and contaminated clothing.
  Wash hands before breaks and at the end of work.
  Store protective clothing separately.
  Avoid contact with the eyes and skin.
· Breathing equipment:
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
· Protection of hands:
  Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**
  Tightly sealed goggles

### 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>· <strong>General Information</strong></td>
</tr>
<tr>
<td>· <strong>Appearance:</strong></td>
</tr>
<tr>
<td>Form: Powder</td>
</tr>
<tr>
<td>Color: Off White</td>
</tr>
<tr>
<td>Odor: Indeterminate</td>
</tr>
<tr>
<td>Odor threshold: Not determined.</td>
</tr>
<tr>
<td>· <strong>pH-value:</strong> Not applicable.</td>
</tr>
<tr>
<td>· <strong>Change in condition</strong></td>
</tr>
<tr>
<td>Boiling point/Boiling range: Undetermined.</td>
</tr>
<tr>
<td>· <strong>Flash point:</strong> Not applicable.</td>
</tr>
<tr>
<td>· <strong>Flammability (solid, gaseous):</strong> Not determined.</td>
</tr>
<tr>
<td>· <strong>Ignition temperature:</strong></td>
</tr>
<tr>
<td>Decomposition temperature: Not determined.</td>
</tr>
<tr>
<td>· <strong>Auto igniting:</strong> Product is not selfigniting.</td>
</tr>
<tr>
<td>· <strong>Danger of explosion:</strong></td>
</tr>
<tr>
<td>See section 10</td>
</tr>
<tr>
<td>· <strong>Explosion limits:</strong> Not Applicable</td>
</tr>
<tr>
<td>Lower: Not Applicable</td>
</tr>
<tr>
<td>Upper: Not Applicable</td>
</tr>
<tr>
<td>· <strong>Vapor pressure:</strong> Not applicable.</td>
</tr>
<tr>
<td>· <strong>Density:</strong> Not Applicable</td>
</tr>
<tr>
<td>· <strong>Relative density</strong></td>
</tr>
<tr>
<td>· <strong>Vapor density</strong> Not applicable.</td>
</tr>
<tr>
<td>· <strong>Evaporation rate</strong> Not applicable.</td>
</tr>
<tr>
<td>· <strong>Solubility in / Miscibility with</strong> Not Determined</td>
</tr>
<tr>
<td>Water: Insoluble</td>
</tr>
<tr>
<td>· <strong>Partition coefficient (n-octanol/water):</strong> Not determined.</td>
</tr>
<tr>
<td>· <strong>Viscosity:</strong> Dynamic: Not applicable.</td>
</tr>
</tbody>
</table>
Trade name: Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin

<table>
<thead>
<tr>
<th>Kinematic:</th>
<th>Not applicable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>· Solvent content:</td>
<td></td>
</tr>
<tr>
<td>Organic solvents:</td>
<td>0.0 %</td>
</tr>
<tr>
<td>VOC content:</td>
<td>0.0 g/l / 0.00 lb/gl</td>
</tr>
<tr>
<td>· Solids content:</td>
<td>100.0 %</td>
</tr>
<tr>
<td>· Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

10 Stability and reactivity

· Reactivity: No further relevant information available.
· Chemical stability
  · Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
  · Possibility of hazardous reactions: No dangerous reactions known.
  · Conditions to avoid: No further relevant information available.
  · Incompatible materials: No further relevant information available.
  · Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

· Information on toxicological effects
· Acute toxicity:
  · LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>7446-20-0 Zinc Sulfate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
</tr>
<tr>
<td>200 mg/kg (mouse)</td>
</tr>
<tr>
<td>1260 mg/kg (rat)</td>
</tr>
</tbody>
</table>

· Primary irritant effect:
  · on the skin: Irritant to skin and mucous membranes.
  · on the eye: Irritating effect.
  · Sensitization: No sensitizing effects known.
· Additional toxicological information:
  The product shows the following dangers according to internally approved calculation methods for preparations:
  Irritant

· Carcinogenic categories
  · IARC (International Agency for Research on Cancer)
    Cobalt Chloride Hexahydrate | Group 2B possibly carcinogenic to humans
  · NTP (National Toxicology Program)
    None of the ingredients is listed.
  · OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients is listed.

12 Ecological information

· Toxicity
  · Aquatic toxicity: No further relevant information available.
  · Persistence and degradability: No further relevant information available.
Safety Data Sheet
acc. to OSHA HCS

Trade name: Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin

(Contd. of page 6)

- Behavior in environmental systems:
- Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- Additional ecological information:
  - General notes:
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
- Other adverse effects No further relevant information available.

13 Disposal considerations

- Waste treatment methods
- Recommendation:
  Can not be disposed together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
- Recommendation: Discard must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, ADR, IMDG, IATA UN1477
- UN proper shipping name
  - DOT Nitrates, inorganic, n.o.s.
  - ADR 1477 Nitrates, inorganic, n.o.s.
  - IMDG, IATA NITRATES, INORGANIC, N.O.S.
- Transport hazard class(es)
  - DOT
    - Class 5.1 Oxidizing substances
    - Label 5.1
  - ADR, IMDG, IATA
    - Class 5.1 Oxidizing substances
    - Label 5.1
  - Packing group
    - DOT, ADR, IMDG, IATA II

(Contd. on page 8)
### Environmental hazards:
- Marine pollutant: No

### Special precautions for user
- Warning: Oxidizing substances

### Danger code (Kemler):
- 50

### EMS Number:
- F-A-S-Q

### Stowage Category
- A

### Segregation Code
- SG38 Stow "separated from" ammonium compounds.
- SG49 Stow "separated from" cyanides

### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Not applicable.

### Transport/Additional information:
- **DOT**
  - Quantity limitations:
    - On passenger aircraft/rail: 5 kg
    - On cargo aircraft only: 25 kg
  - ADR
    - Excepted quantities (EQ)
      - Code: E2
  - IMDG
    - Limited quantities (LQ): 1 kg
    - Excepted quantities (EQ)
      - Code: E2

### UN "Model Regulation":
- UN 1477 NITRATES, INORGANIC, N.O.S., 5.1, II

### Regulatory information

#### Section 355 (extremely hazardous substances):
None of the ingredients is listed.

#### Section 313 (Specific toxic chemical listings):

<table>
<thead>
<tr>
<th>UN number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7757-79-1</td>
<td>Potassium Nitrate</td>
</tr>
<tr>
<td>6484-52-2</td>
<td>Ammonium Nitrate</td>
</tr>
<tr>
<td>10034-96-5</td>
<td>Manganese Sulfate Monohydrate</td>
</tr>
</tbody>
</table>

#### TSCA (Toxic Substances Control Act):

<table>
<thead>
<tr>
<th>UN number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7757-79-1</td>
<td>Potassium Nitrate</td>
</tr>
<tr>
<td>6484-52-2</td>
<td>Ammonium Nitrate</td>
</tr>
<tr>
<td>10043-52-4</td>
<td>Calcium Chloride</td>
</tr>
<tr>
<td>7778-77-0</td>
<td>Potassium Phosphate Monobasic Anhydrous</td>
</tr>
<tr>
<td>87-89-8</td>
<td>D-myo-Inositol, cell culture reagent</td>
</tr>
<tr>
<td>10043-35-3</td>
<td>Boric Acid</td>
</tr>
<tr>
<td>56-40-6</td>
<td>Glycine, free acid</td>
</tr>
<tr>
<td>7681-11-0</td>
<td>Potassium Iodide</td>
</tr>
</tbody>
</table>
Trade name: Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin

| 59-67-6 | nicotinic acid |
| 58-56-0 | Pyridoxine Hydrochloride |
| 59-43-8 | thiamine |

· Proposition 65

· Chemicals known to cause cancer:
  None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:
  None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:
  None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:
  None of the ingredients is listed.

· Carcinogenic categories

  · EPA (Environmental Protection Agency)
    | 10034-96-5 | Manganese Sulfate Monohydrate | D |
    | 10043-35-3 | Boric Acid | I (oral) |

  · TLV (Threshold Limit Value established by ACGIH)
    | 10043-35-3 | Boric Acid | A4 |
    | Cobalt Chloride Hexahydrate | 0.02; confirmed animal carcinogen |

· NIOSH-Ca (National Institute for Occupational Safety and Health)
  None of the ingredients is listed.

· GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

· Hazard pictograms

  GHS03  GHS07  GHS08

· Signal word Danger

· Hazard-determining components of labeling:
  Ammonium Nitrate

· Hazard statements
  May intensify fire; oxidizer.
  Causes skin irritation.
  Causes serious eye irritation.
  May damage fertility or the unborn child.
  May cause respiratory irritation.

· Precautionary statements
  Take any precaution to avoid mixing with combustibles.
  Wear protective gloves / eye protection / face protection.
  Keep away from heat.
  Keep/Store away from clothing/combustible materials.
  Avoid breathing dust/fume/gas/mist/vapors/spray
  Wash thoroughly after handling.
  Use only outdoors or in a well-ventilated area.
  Obtain special instructions before use.

(Contd. on page 10)
Trade name: Murashige and Skoog Medium, without Sucrose, Agar, IAA, and Kinetin

(Contd. of page 9)

Do not handle until all safety precautions have been read and understood.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Specific treatment (see on this label).
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
If skin irritation occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
IF ON SKIN: Wash with plenty of water.
Take off contaminated clothing and wash it before reuse.
Store locked up.
Store in a well- ventilated place. Keep container tightly closed.
Dispose of contents/container in accordance with local/regional/national/international regulations.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- Department issuing SDS: Quality Control Dept.
- Date of preparation / last revision 09/28/2016 / -
- Abbreviations and acronyms:
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit
  Ox. Sol. 2: Oxidizing solids – Category 2
  Skin Irrit. 2: Skin corrosion/irritation – Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
  Rep. 1: Reproductive toxicity – Category 1
  STOT SE 3: Specific target organ toxicity (single exposure) – Category 3