# SAFETY DATA SHEET

## 1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product identifier
- **Product identifier**: Crystal Green®
- **Chemical Name**: Struvite, Magnesium Ammonium Phosphate Hexahydrate.
- **Chemical Formula**: MgNH₄PO₄·6H₂O
- **Trade Name**: Crystal Green®
- **CAS No.**: 13478-16-5

### 1.2 Recommended use of the chemical and restrictions on use
- **Identified Use(s)**: Slow release fertilizer.
- **Uses Advised Against**: None known.

### 1.3 Supplier's details
- **Company Identification**: Ostara Nutrient Recovery Technologies Inc.
  Suite 690- 1199 West Pender St
  Vancouver, BC,
  V6E 2R1, Canada
- **Telephone**: (604) 408-6697
- **E-mail**: abritton@ostara.com

### 1.4 Emergency Phone No.
- **Emergency Phone No.** (604) 408-6697

## 2. SECTION 2: HAZARDS IDENTIFICATION

<table>
<thead>
<tr>
<th>GHS Classification</th>
<th>Acute Toxicity Oral Category 5</th>
<th>Skin Irritant Category 3</th>
<th>Eye Irritant Category 2B</th>
<th>STOT SE Category 3</th>
<th>Hazard Statement H303</th>
<th>Hazard Statement H316</th>
<th>Hazard Statement H320</th>
<th>Hazard Statement H335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Word: WARNING</td>
<td>Hazard Statement(S)</td>
<td>H316: Causes mild skin irritation</td>
<td>H320: Causes eye irritation</td>
<td>H335: May cause respiratory irritation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Label Elements:

#### Prevention:
- P264: Wash thoroughly after handling
- P280: Wear protective gloves
- P261: Avoid breathing dust
- P271 Use only outdoors or in a well-ventilated area

#### Response
- P302+P352
- P332+P313
- P305+P351+P338
- P337+P313
- P304+P340
- P312
- IF ON SKIN: Wash with water
  If skin irritation occurs: get medical advice/attention
  IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
  IF eye irritation persists: Get medical attention/advice
  IF INHALED: Remove person to fresh air and keep comfortable for breathing
  Call a POISON CENTER
3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

<table>
<thead>
<tr>
<th>Hazardous Ingredient(s)</th>
<th>CAS No.</th>
<th>%W/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium Ammonium Phosphate Hexahydrate</td>
<td>13478-16-5</td>
<td>&gt;97</td>
</tr>
</tbody>
</table>

3.2 Additional Information

None.

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation
If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Skin Contact
After contact with skin, wash immediately with plenty of soap and water.

Eye Contact
First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

Ingestion
If swallowed, rinse mouth with water (only if the person is conscious).

4.2 Most important symptoms and effects, both acute and delayed

Dust may have irritant effect on skin, eyes and air passages.

4.3 Indication of any immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

5. SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

Suitable Extinguishing Media
As appropriate for surrounding fire.

Unsuitable Extinguishing Media
None known.

5.2 Special hazards arising from the substance or mixture

Toxic fumes may be produced in a fire.

Decomposition products: Nitrogen oxides, Magnesium oxides, Phosphorus oxides.

5.3 Advice for fire-fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire.
6. **SECTION 6: ACCIDENTAL RELEASE MEASURES**

6.1 **Personal precautions, protective equipment and emergency procedures**


6.2 **Environmental precautions**

Do not allow to enter drains, sewers or waterways.

6.3 **Methods and material for containment and cleaning up**

Sweep spilled substances into containers if appropriate; moisten first to prevent dusting. Use vacuum equipment for collecting spill materials, where practicable. Transfer to a container for disposal.

6.4 **Reference to other sections**

See Also Section 8, 13.

7. **SECTION 7: HANDLING AND STORAGE**

7.1 **Precautions for safe handling**

Provide adequate ventilation. Avoid generation of dust. Avoid breathing dust. Wear suitable gloves. Wash hands thoroughly after handling.

7.2 **Conditions for safe storage, including any incompatibilities**

Keep container tightly closed and in a well-ventilated place. Keep away from heat and direct sunlight.

7.2.1 **Storage temperature**

<55°C

7.2.2 **Storage life**

Stable under normal conditions.

7.2.3 **Incompatible materials**

Strong oxidizing agents.

8. **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

8.1 **Control parameters**

**Occupational Exposure Limits**

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>CAS No.</th>
<th>LTEL (8 hr TWA ppm)</th>
<th>LTEL (8 hr TWA mg/m³)</th>
<th>STEL (ppm)</th>
<th>STEL (mg/m³)</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.2 **Appropriate engineering controls**

8.3 **Individual protection measures, such as personal protective equipment (PPE)**

- **Eye/face protection**
  - Not normally required.
  - Wear protective eyewear (goggles, face shield, or safety glasses).

- **Skin protection**
  - Not normally required.
  - Wear suitable gloves if prolonged skin contact is likely.

- **Respiratory protection**
  - Normally no personal respiratory protection is necessary. An approved dust mask should be worn if dust is generated during processing or handling. A suitable dust mask or dust respirator with filter type P (EN143 or EN405) may be appropriate.
  - Not applicable.

- **Thermal hazards**

Crystal Green® is sustainably produced by Ostara Nutrient Recovery Technologies, Inc.
9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Powder/Pellets (up to 5mm diameter)</td>
</tr>
<tr>
<td>Odor</td>
<td>Musty/Ammonia (when damp or heated above 55°C)</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not established.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting Point/Freezing Point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Non-flammable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.7</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>1 g/ml</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Insoluble in water.</td>
</tr>
<tr>
<td>Partition coefficient: n- octanol/water</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>&gt;55°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not explosive.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not oxidizing.</td>
</tr>
</tbody>
</table>

9.2 Other information

Molecular weight 245 Atomic Mass Unit

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity                           Stable under normal conditions.
10.2 Chemical stability                    Stable under normal conditions.
10.3 Possibility of hazardous reactions   Stable under normal conditions.
10.4 Conditions to avoid                  Heat and direct sunlight.
10.5 Incompatible materials               Strong oxidizing agents.
10.6 Hazardous decomposition product(s)   Nitrogen oxides, Magnesium oxides, Phosphorus oxides.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

- Acute toxicity: Low acute toxicity.
- Skin corrosion/irritation: Not classified.
- Serious eye damage/irritation: Not classified.
- Respiratory or skin sensitization: Not classified.
- Germ cell mutagenicity: There is no evidence of mutagenic potential.
- Carcinogenicity: No evidence of carcinogenicity.
- Reproductive toxicity: Not classified.
- STOT - single exposure: Not classified.
- STOT - repeated exposure: Not classified.
- Aspiration hazard: None anticipated.

11.2 Other information

None.
12. **SECTION 12: ECOLOGICAL INFORMATION**

12.1 Toxicity
Low toxicity to aquatic organisms.

12.2 Persistence and degradability
There is evidence of degradation in soil. Not persistent.

12.3 Bioaccumulative potential
The substance has no potential for bioaccumulation.

12.4 Mobility in soil
Insoluble in water. The substance is predicted to have low mobility in soil.

12.5 Other adverse effects
None known.

13. **SECTION 13: DISPOSAL CONSIDERATIONS**

13.1 Waste treatment methods
Dispose at suitable refuse site.

13.2 Additional Information
Disposal should be in accordance with local, state or national legislation.

US RCRA Hazard Class
Not listed.

14. **SECTION 14: TRANSPORT INFORMATION**

D.O.T. Classification
Not classified as dangerous for transport.

14.1 UN number
Not applicable.

14.2 Proper Shipping Name
Not applicable.

14.3 Transport hazard class(es)
Not applicable.

14.4 Packing group
Not applicable.

14.5 Environmental hazards
Not applicable.

14.6 Special precautions for user
Not applicable.

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

15. **SECTION 15: REGULATORY INFORMATION**

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

15.1.1 USA

OSHA
Not listed.

State Right to Know Lists
Not listed.

TSCA
Not listed.

Title III Consolidated List of Lists
Not listed.

Proposition 65 (California)
Not listed.

OSPAR List of Chemicals for Priority Action
Not listed.

15.1.2 Canada

WHMIS – Ingredient Disclosure List
Not listed.

Domestic Substances List (DSL)
Not listed.

List of Challenge Substances
Not listed.

Priority Substances List
Not listed.

Toxic Substances List
Not listed.

National Pollutant Release Inventory (NPRI)
Not listed.

Substance Lists
16. SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: 1-16.

<table>
<thead>
<tr>
<th>NFPA</th>
<th>HMIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Health</td>
</tr>
<tr>
<td>Fire</td>
<td>Flammability</td>
</tr>
<tr>
<td>Instability</td>
<td>Physical hazards</td>
</tr>
</tbody>
</table>

**LEGEND**

- **LTEL**: Long Term Exposure Limit
- **STEL**: Short Term Exposure Limit
- **STOT**: Specific Target Organ Toxicity
- **OSHA**: Occupational Safety and Health Administration
- **TSCA**: Toxic Substances Control Act
- **NFPA**: National Fire Protection Association
- **HMIS**: Hazardous Material Information System
- **WHMIS**: Workplace Hazardous Materials Information System

**Additional Information (Canada)**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the Material Safety Data Sheet contains all of the information required by the Controlled Products Regulations.

**Disclaimers**

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