


SAFETY DATA SHEET

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

1.1	Product identifier	Product identifier Chemical Name Chemical Formula Trade Name CAS No.	Crystal Green® Struvite, Magnesium Ammonium Phosphate Hexahydrate. $MgNH_4PO_4 \cdot 6H_2O$ Crystal Green® 13478-16-5
1.2	Recommended use of the chemical and restrictions on use	Identified Use(s) Uses Advised Against	Slow release fertilizer. None known.
1.3	Supplier's details	Company Identification Telephone E-mail	Ostara Nutrient Recovery Technologies Inc. Suite 690- 1199 West Pender St Vancouver, BC V6E 2R1, Canada (604) 408-6697 abritton@ostara.com (604) 408-6697
1.4	Emergency Phone No.		(604) 408-6697

2. SECTION 2: HAZARDS IDENTIFICATION

GHS Classification	Acute Toxicity Oral Category 5 Skin Irritant Category 3 Eye Irritant Category 2B STOT SE Category 3	Hazard Statement H303 Hazard Statement H316 Hazard Statement H320 Hazard Statement H335
	Signal Word: WARNING Hazard Statement(S) H316: Causes mild skin irritation H320: Causes eye irritation H335: May cause respiratory irritation	
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
Storage:	P404 + P233	Store in a well-ventilated place. Keep container tightly closed
Disposal:	P501	Disposal of content/containers to be in accordance with local/regional/national regulations

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Hazardous Ingredient(s)	CAS No.	%W/W
Magnesium Ammonium Phosphate Hexahydrate	13478-16-5	>97

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

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|-----|--|---|
| 6.1 | Personal precautions, protective equipment and emergency procedures | Ensure adequate ventilation. Ensure suitable personal protection during removal of spillages. Avoid generation of dust. Avoid breathing dust. |
| 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 spilt 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

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|-------|---|---|
| 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

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
None						

- 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.

Thermal hazards

Not applicable.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

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

9.2 Other information

Molecular weight	245 Atomic Mass Unit
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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) Substance Lists	Not listed.

16. SECTION 16: OTHER INFORMATION

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

NFPA		HMIS	
Health	0	Health	0
Fire	0	Flammability	0
Instability	0	Physical hazards	0

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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