

Oxygen Release Compound – Advanced Pellets (ORC Advanced® Pellets)
MATERIAL SAFETY DATA SHEET (MSDS)

Last Revised: March 22, 2012

Section 1 - Material Identification

Supplier:



REGENESIS

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Chemical Description: A mixture of Calcium Hydroxide Oxide [CaO(OH)₂] and Calcium Hydroxide [Ca(OH)₂].

Chemical Family: Inorganic Chemical

Trade Name: Advanced Formula Oxygen Release Compound
(ORC Advanced® Pellets)

Chemical Synonyms: Calcium OxyHydroxide; Calcium Oxide Peroxide

Product Use: Used to remediate contaminated soil and groundwater
(environmental applications)

Section 2 – Composition

| <u>CAS No.</u> | <u>Chemical</u> |
|----------------|---|
| 682334-66-3 | Calcium Hydroxide Oxide [CaO(OH) ₂] |
| 1305-62-0 | Calcium Hydroxide [Ca(OH) ₂] |
| 7758-11-4 | Dipotassium Phosphate (HK ₂ O ₄ P) |
| 7783-28-0 | Ammonium Phosphate Dibasic [(NH ₄) ₂ HPO ₄] |

Section 3 – Physical Data

| | |
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| Form: | tablets |
| Color: | White to Pale Yellow |
| Odor: | Odorless |
| Melting Point: | 527 °F (275 °C) – Decomposes |
| Boiling Point: | Not Applicable (NA) |
| Flammability/Flash Point: | NA |
| Auto-Flammability: | NA |
| Vapor Pressure: | NA |
| Self-Ignition Temperature: | NA |
| Thermal Decomposition: | 527 °F (275 °C) – Decomposes |
| Bulk Density: | 0.5 – 0.65 g/ml (Loose Method) |
| Solubility: | 1.65 g/L @ 68° F (20° C) for calcium hydroxide. |
| Viscosity: | NA |
| pH: | 11-13 (saturated solution) |
| Explosion Limits % by Volume: | Non-explosive |
| Hazardous Decomposition Products: | Oxygen, Hydrogen Peroxide, Steam, and Heat |
| Hazardous Reactions: | None |

Section 4 – Reactivity Data

Stability: Stable under certain conditions (see below).

Conditions to Avoid: Heat and moisture.

Incompatibility: Acids, bases, salts of heavy metals, reducing agents, and flammable substances.

Hazardous Polymerization: Does not occur.

Section 5 – Regulations

TSCA Inventory List: Listed

CERCLA Hazardous Substance (40 CFR Part 302)

Listed Substance: No

Unlisted Substance: Yes

Reportable Quantity (RQ): 100 pounds

Characteristic(s): Ignitibility

RCRA Waste Number: D001

SARA, Title III, Sections 302/303 (40 CFR Part 355 – Emergency Planning and Notification)

Extremely Hazardous Substance: No

SARA, Title III, Sections 311/312 (40 CFR Part 370 – Hazardous Chemical Reporting: Community Right-To-Know)

Hazard Category: Immediate Health Hazard
Fire Hazard

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**Threshold
Planning Quantity:** 10,000 pounds

Section 5 – Regulations (cont)

SARA, Title III, Section 313 (40 CFR Part 372 – Toxic Chemical Release Reporting: Community Right-To-Know)

**Extremely Hazardous
Substance:** No

**WHMIS
Classification:** C Oxidizing Material
Poisonous and Infectious
Material
D Material Causing Other
Toxic Effects –
Eye and Skin Irritant

**Canadian Domestic
Substance List:** Not Listed

Section 6 – Protective Measures, Storage and Handling

Technical Protective Measures

Storage: Keep in tightly closed container. Store in dry area, protected from heat sources and direct sunlight.

Handling: Clean and dry processing pipes and equipment before operation. Never return unused product to the storage container. Keep away from incompatible products. Containers and equipment used to handle this product should be used exclusively for this material. Avoid contact with water or humidity.

Section 6 – Protective Measures, Storage and Handling (cont)

Personal Protective Equipment (PPE)

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|---|---|
| | <p><u>Calcium Hydroxide</u> ACGIH® TLV® (2000) 5 mg/m³ TWA OSHA PEL Total dust–15 mg/m³ TWA Respirable fraction– 5 mg/m³ TWA NIOSH REL (1994) 5 mg/m³</p> |
| Engineering Controls: | |
| Respiratory Protection: | <p>For many conditions, no respiratory protection may be needed; however, in dusty or unknown atmospheres use a NIOSH approved dust respirator.</p> |
| Hand Protection: | <p>Impervious protective gloves made of nitrile, natural rubber or neoprene.</p> |
| Eye Protection: | <p>Use chemical safety goggles (dust proof).</p> |
| Skin Protection: | <p>For brief contact, few precautions other than clean clothing are needed. Full body clothing impervious to this material should be used during prolonged exposure.</p> |
| Other: | <p>Safety shower and eyewash stations should be present. Consultation with an industrial hygienist or safety manager for the selection of PPE suitable for working conditions is suggested.</p> |
| Industrial Hygiene: | <p>Avoid contact with skin and eyes.</p> |
| Protection Against Fire & Explosion: | <p>NA</p> |

Section 7 – Hazards Identification

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| Emergency Overview: | <p>Oxidizer – Contact with combustibles may cause a fire. This material decomposes and releases oxygen in a fire. The additional oxygen may intensify the fire.</p> |
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| Potential Health Effects: | Irritating to the mucous membrane and eyes. If the product splashes in ones face and eyes, treat the eyes first. Do not dry soiled clothing close to an open flame or heat source. Any clothing that has been contaminated with this product should be submerged in water prior to drying. |
| Inhalation: | High concentrations may cause slight nose and throat irritation with a cough. There is risk of sore throat and nose bleeds if one is exposed to this material for an extended period of time. |
| Eye Contact: | Severe eye irritation with watering and redness. There is also the risk of serious and/or permanent eye lesions. |
| Skin Contact: | Irritation may occur if one is exposed to this material for extended periods. |
| Ingestion: | Irritation of the mouth and throat with nausea and vomiting. |

Section 8 – Measures in Case of Accidents and Fire

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| After Spillage/Leakage/Gas Leakage: | Collect in suitable containers. Wash remainder with copious quantities of water. |
| Extinguishing Media: | See next. |
| Suitable: | Large quantities of water or water spray. In case of fire in close proximity, all means of extinguishing are acceptable. |
| Further Information: | Self contained breathing apparatus or approved gas mask should be worn due to small particle size. Use extinguishing media appropriate for surrounding fire. Apply cooling water to sides of transport or storage vessels that are exposed to flames until the fire is extinguished. Do not approach hot vessels that contain this product. |
| First Aid: | After contact with skin, wash immediately with plenty of water and soap. In case of contact with eyes, rinse immediately with plenty of water and seek medical attention. Consult an ophthalmologist in all cases. |

Section 8 – Measures in Case of Accidents and Fire

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| Eye Contact: | Flush eyes with running water for 15 minutes, while keeping the eyelids wide open. Consult with an ophthalmologist in all cases. |
| Inhalation: | Remove subject from dusty environment. Consult with a physician in case of respiratory symptoms. |
| Ingestion: | If the victim is conscious, rinse mouth and administer fresh water. DO NOT induce vomiting. Consult a physician in all cases. |
| Skin Contact: | Wash affected skin with running water. Remove and clean clothing. Consult with a physician in case of persistent pain or redness. |
| Special Precautions: | Evacuate all non-essential personnel. Intervention should only be done by capable personnel that are trained and aware of the hazards associated with this product. When it is safe, unaffected product should be moved to safe area. |
| Specific Hazards: | <u>Oxidizing substance</u> . Oxygen released on exothermic decomposition may support combustion. Confined spaces and/or containers may be subject to increased pressure. If product comes into contact with flammables, fire or explosion may occur. |

Section 9 – Accidental Release Measures

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| Precautions: | Observe the protection methods cited in Section 3. Avoid materials and products that are incompatible with product. Immediately notify the appropriate authorities in case of reportable discharge (> 100 lbs). |
| Cleanup Methods: | Collect the product with a suitable means of avoiding dust formation. All receiving equipment should be clean, vented, dry, labeled and made of material that this product is compatible with. Because of the contamination risk, the collected material should be kept in a safe isolated place. Use large quantities of water to clean the impacted area. See Section 12 for disposal methods. |

Section 10 – Information on Toxicology

Toxicity Data

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| | Oral Route, LD ₅₀ , rat, > 2,000 mg/kg (powder 50%) |
| Acute Toxicity: | Dermal Route, LD ₅₀ , rat, > 2,000 mg/kg (powder 50%) Inhalation, LD ₅₀ , rat, > 5,000 mg/m ³ (powder 35%) |
| Irritation: | Rabbit (eyes), severe irritant |
| Sensitization: | No data |
| Chronic Toxicity: | In vitro, no mutagenic effect (Powder 50%) |
| Target Organ Effects: | Eyes and respiratory passages. |

Section 11 – Information on Ecology

Ecology Data

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| | 10 mg Ca(OH) ₂ /L: pH = 9.0 100 mg Ca(OH) ₂ /L: pH = 10.6 |
| Acute Exotoxicity: | Fishes, Cyprinus carpio, LC ₅₀ , 48 hrs, 160 mg/L Crustaceans, Daphnia sp., EC ₅₀ , 24 hours, 25.6 mg/L (Powder 16%) |
| Mobility: | Low Solubility and Mobility Water – Slow Hydrolysis. Degradation Products: Calcium Hydroxide |
| Abiotic Degradation: | Water/soil – complexation/precipitation. Carbonates/sulfates present at environmental concentrations. Degradation products: carbonates/sulfates sparingly soluble |
| Biotic Degradation: | NA (inorganic compound) |
| Potential for Bioaccumulation: | NA (ionizable inorganic compound) |

Section 11 – Information on Ecology (cont)

Observed effects are related to alkaline properties of the product. Hazard for the environment is limited due to the product properties of:

Comments:

- No bioaccumulation
- Weak solubility and precipitation as carbonate or sulfate in an aquatic environment.

Diluted product is rapidly neutralized at environmental pH.

Further Information: NA

Section 12 – Disposal Considerations

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| Waste Method: | Disposal | Consult current federal, state and local regulations regarding the proper disposal of this material and its emptied containers. |
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Section 13 – Shipping/Transport Information

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| D.O.T Shipping Name: | Oxidizing Solid, N.O.S [A mixture of Calcium Hydroxide Oxide [CaO(OH) ₂] and Calcium Hydroxide [Ca(OH) ₂]. |
| UN Number: | 1479 |
| Hazard Class: | 5.1 |
| Label(s): | 5.1 (Oxidizer) |
| Packaging Group: | II |
| STCC Number: | 4918717 |

Section 14 – Other Information

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|---------------------|------------------|----------------|
| HMIS® Rating | Health – 2 | Reactivity – 1 |
| | Flammability – 0 | PPE - Required |

HMIS® is a registered trademark of the National Painting and Coating Association.

| | | |
|---------------------|------------------|----------------|
| NFPA® Rating | Health – 2 | Reactivity – 1 |
| | Flammability – 0 | OX |

NFPA® is a registered trademark of the National Fire Protection Association.

Reason for Issue:

Update toxicological and ecological data

Section 15 – Further Information

The information contained in this document is the best available to the supplier at the time of writing, but is provided without warranty of any kind. Some possible hazards have been determined by analogy to similar classes of material. The items in this document are subject to change and clarification as more information become available.