Section 1: Product and Company Identification

Papain

Synonyms/General Names: Papayotin, Vegetable Pepsin
Product Use: For educational use only
Manufacturer: Columbus Chemical Industries, Inc., Columbus, WI 53925.

Section 2: Hazards Identification

White powder, faint characteristic odor, slightly hygroscopic.

This material is not considered hazardous.
Target organs: None known.

This material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200) if used properly.

Section 3: Composition / Information on Ingredients

Papain (9001-73-4), >99%

Section 4: First Aid Measures

Always seek professional medical attention after first aid measures are provided.

Eyes: Immediately flush eyes with excess water for 15 minutes, lifting lower and upper eyelids occasionally.

Skin: Immediately flush skin with excess water for 15 minutes while removing contaminated clothing.

Ingestion: Call Poison Control immediately. Rinse mouth with cold water. Give victim 1-2 cups of water or milk to drink. Induce vomiting immediately.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration.

Section 5: Fire Fighting Measures

When heated to decomposition, emits acrid fumes.

Protective equipment and precautions for firefighters: Use foam or dry chemical to extinguish fire. Firefighters should wear full fire fighting turn-out gear and respiratory protection (SCBA). Cool container with water spray. Material is not sensitive to mechanical impact or static discharge.

Section 6: Accidental Release Measures

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Sweep up spill and place in sealed bag or container for disposal. Wash spill area after pickup is complete. See Section 13 for disposal information.

Section 7: Handling and Storage Green

Handling: Use with adequate ventilation and do not breathe dust or vapor. Avoid contact with skin, eyes, or clothing. Wash hands thoroughly after handling.

Storage: Store in General Storage Area [Green Storage] with other items with no specific storage hazards. Store in a cool, dry, well-ventilated, locked store room away from incompatible materials.

Section 8: Exposure Controls / Personal Protection

Use ventilation to keep airborne concentrations below exposure limits. Have approved eyewash facility, safety shower, and fire extinguishers readily available. Wear chemical splash goggles and chemical resistant clothing such as gloves and aprons. Wash hands thoroughly after handling material and before eating or drinking. Use NIOSH-approved respirator with a dust cartridge.

Exposure guidelines: Papain: OSHA PEL: N/A, ACGIH: TLV: N/A, STEL: N/A.
Section 9: Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular formula</td>
<td>N/A</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>N/A</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Density (air=1)</td>
<td>N/A</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Decomposes</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Decomposes</td>
</tr>
<tr>
<td>Vapor Pressure (20°C)</td>
<td>N/A</td>
</tr>
<tr>
<td>Flash Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Autoignition Temp.</td>
<td>N/A</td>
</tr>
<tr>
<td>Appearance</td>
<td>White powder</td>
</tr>
<tr>
<td>Odor</td>
<td>Faint</td>
</tr>
<tr>
<td>Odor Threshold</td>
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</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water and glycerol</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>N/A. (Butyl acetate = 1)</td>
</tr>
<tr>
<td>Partition Coefficient</td>
<td>N/A. (log $P_{OW}$)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>N/A</td>
</tr>
<tr>
<td>Odor</td>
<td>N/A</td>
</tr>
<tr>
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</tr>
<tr>
<td>Autoignition Temp.</td>
<td>N/A</td>
</tr>
</tbody>
</table>

N/A = Not available or applicable

Section 10: Stability and Reactivity
Avoid heat and moisture.
Stability: Stable under normal conditions of use and storage.
Incompatibility: Strong oxidizers.
Shelf life: Fair shelf life, store in a cool dry environment.

Section 11: Toxicology Information
Acute Symptoms/Signs of exposure:
- Eyes: Redness, tearing, itching, burning, conjunctivitis.
- Skin: Redness, itching.
Ingestion: Irritation and burning sensations of mouth and throat, nausea, vomiting and abdominal pain.
Inhalation: Irritation of mucous membranes, coughing, wheezing, shortness of breath.
Chronic Effects: No information found.
Sensitization: none expected
Papain: LD50 [oral, rat]: N/A; LC50 [rat]: N/A; LD50 Dermal [rabbit]: N/A
Material has not been found to be a carcinogen nor produce genetic, reproductive, or developmental effects.

Section 12: Ecological Information
Ecotoxicity (aquatic and terrestrial): Not considered an environmental hazard

Section 13: Disposal Considerations
Check with all applicable local, regional, and national laws and regulations. Local regulations may be more stringent than regional or national regulations. Small amounts of this material may be suitable for sanitary sewer or trash disposal.

Section 14: Transport Information
DOT Shipping Name: Not regulated by DOT.
DOT Hazard Class: Hazard Class:
Identification Number: UN Number:
Canada TDG: Not regulated by TDG.

Section 15: Regulatory Information
EINECS: Listed (232-627-2).
TSCA: All components are listed or are exempt.
WHMIS Canada: Not WHMIS Controlled.
California Proposition 65: Not listed.
The product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Section 16: Other Information
Current Issue Date: January 23, 2009
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