SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Bromelain (Freeze-Dried)

MANUFACTURER: American Red Cross
Diagnostic Manufacturing Division
9319 Gaither Road
Gaithersburg, MD 20877

TELEPHONE: (301) 212-2704
FAX: (301) 212-2721
EMERGENCY: (800) 882-3737

REVISION DATE: 05/28/2015

PRODUCT USE: Immunohematology Testing

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW Although this product has not been tested as a whole, it contains materials that may cause irritation, sensitization, or allergic reactions.

OSHA REGULATORY STATUS This product is considered hazardous under 29 CFR 1910.1200.

HMIS CLASSIFICATION:

- Health: 1
- Flammability: 0
- Physical Hazard: 0
- Personal Protection: B

NFPA RATING:

- Health: 1
- Flammability: 0
- Instability: 0

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No.</th>
<th>% WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromelain powder</td>
<td>9001-00-7</td>
<td>36.2</td>
</tr>
<tr>
<td>L-Cysteine, HCl (monohydrate)</td>
<td>7048-04-6</td>
<td>19.6</td>
</tr>
<tr>
<td>Citric Acid (monohydrate)</td>
<td>5949-29-1</td>
<td>1.0</td>
</tr>
<tr>
<td>Sodium Phosphate (dibasic), anhydrous</td>
<td>7558-79-4</td>
<td>7.4</td>
</tr>
<tr>
<td>Potassium Phosphate</td>
<td>7778-53-2</td>
<td>31.5</td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>1310-73-2</td>
<td>4.3</td>
</tr>
</tbody>
</table>
SECTION 4: FIRST AID MEASURES

**EYE CONTACT**
Immediately flush eyes with plenty of water for 15 minutes. Remove contact lenses.

**SKIN CONTACT**
Wash off with soap and water.

**INHALATION**
If symptoms develop, remove affected person from source of exposure into fresh air. Persons developing hypersensitivity (anaphylactic) reaction must receive immediate medical attention.

**INGESTION**
Rinse mouth with water. Drink copious amounts of water. Seek medical attention immediately.

SECTION 5: FIRE-FIGHTING MEASURES

**SUITABLE EXTINGUISHING MEDIA**
Water spray, carbon dioxide, dry chemical powder, or appropriate foam. Use any fire extinguishing agent that is suitable for the surrounding fire.

**UNSUITABLE EXTINGUISHING MEDIA**
Do not use an extinguishing agent that is incompatible with surrounding fire.

**HAZARDOUS COMBUSTION PRODUCTS**
None known.

**PROTECTIVE EQUIPMENT AND SPECIAL PRECAUTIONS FOR FIRE-FIGHTERS**
May emit toxic fumes under fire conditions. Firefighters should wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

SECTION 6: ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS**
Observe precautions from other sections. Keep unnecessary personnel away. Personal Protective Equipment (PPE) identified in Section 8 should be worn to prevent inhalation and exposure to skin and eyes.

**ENVIRONMENTAL PRECAUTIONS**
None

**METHODS FOR CONTAINMENT**
Try to avoid dust generation during cleanup.

**METHODS FOR CLEANING UP**
Carefully scoop up powder spill. Do not sweep, try to avoid dust generation. Can be moistened with water to aid removal. Place spill in appropriate container and dispose in accordance with federal, state, or local requirements. Ventilate area and wash spill site after material removal is complete. Avoid high pressure rinsing. Wash contaminated clothing before reuse.
SECTION 7: HANDLING AND STORAGE

HANDLING
Avoid contact with eyes, skin, and clothing. Do not inhale or ingest.

STORAGE
Below 8° C.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>HAZARDOUS COMPONENTS</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TWA ppm</td>
<td>TWA mg/m³</td>
<td>STEL ppm</td>
</tr>
<tr>
<td>Bromelain</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>L-Cysteine, HCl (monohydrate)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Citric Acid (monohydrate)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sodium Phosphate (dibasic), anhydrous</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Potassium Phosphate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sodium Hydroxide</td>
<td>N/A</td>
<td>2 mg/m³</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Eye/Face Protection
Face Shield or Safety glasses/goggles. An engineering control such as a table-top shield is recommended if using safety glasses/goggles.

Skin Protection
Disposable latex (or equivalent) gloves and lab coat.

Respiratory Protection
Respiratory protection is not necessary if used in a well-ventilated laboratory area with a source of outside air. An additional risk assessment is recommended if there is deviation from normal procedure, which was documented as having an exposure time of 5-6 seconds, several times per week.

General Hygiene Considerations
When using, do not eat, drink or smoke. Wash hands thoroughly after handling. Launder clothing before reuse if noticeably contaminated. Keep away from food and drink.
SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>White to off-white color</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight to mild sulfurous odor</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not Available</td>
</tr>
<tr>
<td>Form</td>
<td>Powder</td>
</tr>
<tr>
<td>pH</td>
<td>Not Available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>None</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability Limits in Air, Upper, % by Volume</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Flammability Limits in Air, Lower, % by Volume</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not Available</td>
</tr>
<tr>
<td>Vapor Density (air=1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Density</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Partition Coefficient (n-octanol/water)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Auto-Ignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 10: CHEMICAL STABILITY AND REACTIVITY INFORMATION

CHEMICAL STABILITY
Stable.

CONDITIONS TO AVOID
Avoid excessive heat.

INCOMPATIBLE MATERIALS
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
None known

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE EFFECTS

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>May cause irritation.</td>
</tr>
<tr>
<td>Skin</td>
<td>May cause irritation.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>May cause irritation to the respiratory system, respiratory sensitization (enzyme asthma)</td>
</tr>
<tr>
<td>Ingestion</td>
<td>May cause irritation.</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Eyes, Skin, and Respiratory system.</td>
</tr>
</tbody>
</table>

CARCINOGENICITY
This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC and NTP.

EFFECTS OF OVEREXPOSURE
Can cause asthma, skin eruptions, anaphylactic shock, and proteolytic action.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY
No known significant effects or critical hazards.
SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL INSTRUCTIONS
Dispose in accordance with all applicable regulations.

SECTION 14: TRANSPORT INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT) REQUIREMENTS
Not regulated as dangerous goods.

SECTION 15: REGULATORY INFORMATION

CERCLA REPORTABLE QUANTITY
None

SARA 311/312 HAZARDS
None

SARA 302 COMPONENTS
None

SARA 313 COMPONENTS
None

TOXIC SUBSTANCES CONTROL ACT (TSCA)
All components of this product comply with all applicable rules and orders under TSCA.

CALIFORNIA PROP 65
This product does not contain any chemicals known to State of California to cause cancer, birth defects or other reproductive harm.

SECTION 16: OTHER INFORMATION

None

PREPARED BY: American Red Cross, Safety Department