IDENTIFICATION

MSDS Record Number: 5617931
Product Name(s): GUANIDINE THIOCYANATE
Product Identification: MSDS NUMBER: GB432
                     PRODUCT CODE: 4083, M878, H601
                     C.A.S. NUMBER: 593-84-0
Date of MSDS:        2006-01-16
Currency Note:       This MSDS was acquired from the supplier on 2007-09-06.

MANUFACTURER/SUPPLIER INFORMATION

Company: MALLINCKRODT BAKER INC

MATERIAL SAFETY DATA

Effective Date: 01/16/06
Supercedes: 08/10/04

From: Mallinckrodt Baker, Inc.
      222 Red School Lane
      Phillipsburg, NJ 08865

Emergency Telephone Number: 908-859-2151

CHEMTREC: 800-424-9300 (USA)
           703-527-3887 (Outside USA & CANADA)
CANUTEC: 613-996-6666

NOTE: Use CHEMTREC and CANUTEC phone numbers only in the event of a chemical emergency.

All non-emergency questions should be directed to Customer Service
(1-800-582-2537) for assistance.

MALLINCKRODT                                      J. T. BAKER
GUANIDINE THIOCYANATE

1. Product Identification

   Synonyms: Thiocyanic acid, compounded with guanidine (1:1);
             Guanidine monothiocyanate; Guanidium thiocyanate
   CAS No:   593-84-0
   Molecular Weight: 118.16
   Chemical Formula: NH2C(+NH)NH2.CHNS
2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanidine Thiocyanate</td>
<td>593-84-0</td>
<td>90 - 100%</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSED IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

SAP-T-DATA™ Ratings (Provided here for your convenience)

<table>
<thead>
<tr>
<th>Health Rating</th>
<th>2 - Moderate (Life)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability Rating</td>
<td>1 - Slight</td>
</tr>
<tr>
<td>Reactivity Rating</td>
<td>1 - Slight</td>
</tr>
<tr>
<td>Contact Rating</td>
<td>2 - Moderate</td>
</tr>
</tbody>
</table>
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Green (General Storage)

Potential Health Effects

Information on the human health effects from exposure to this substance is limited. The health effects given below are those of soluble thiocyanate salts. The health effects of this substance are expected to be similar.

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.

Ingestion:
May cause psychosis, vomiting, disorientation, weakness, low blood pressure, convulsions and death which may be delayed. The probable lethal dose is between 15-30 grams.

Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain.

Eye Contact:
Causes irritation, redness, and pain.

Chronic Exposure:
Prolonged or repeated skin exposure may cause dermatitis. Repeated ingestion of small amounts may cause weakness, confusion, central nervous system effects, nausea and skin eruptions.

Aggravation of Pre-existing Conditions:
No information found.
4. First Aid Measures

   Inhalation:
   Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

   Ingestion:
   Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

   Skin Contact:
   Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

   Eye Contact:
   Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

   Fire:
   As with most organic solids, fire is possible at elevated temperatures or by contact with an ignition source.

   Explosion:
   Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

   Fire Extinguishing Media:
   Water spray, dry chemical, alcohol foam, or carbon dioxide.

   Special Information:
   In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. May emit toxic and flammable fumes of cyanide if involved in a fire.

6. Accidental Release Measures

   Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

7. Handling and Storage

   Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from any source of heat or ignition. Isolate from incompatible substances. Isolate from oxidizing materials. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.
8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g., lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White crystals.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>No information found.</td>
</tr>
<tr>
<td>Odor</td>
<td>No information found.</td>
</tr>
<tr>
<td>Melting Point</td>
<td>115 - 118°C (239 - 244°F)</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water.</td>
</tr>
<tr>
<td>Vapor Density (Air=1)</td>
<td>No information found.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>No information found.</td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>No information found.</td>
</tr>
<tr>
<td>pH</td>
<td>No information found.</td>
</tr>
<tr>
<td>Evaporation Rate (BuAc=1)</td>
<td>No information found.</td>
</tr>
</tbody>
</table>

% Volatiles by volume @ 21°C (70°F): 0

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:
Burning may produce fumes of cyanide, carbon monoxide, carbon dioxide, nitrogen oxides and sulfur oxides.
Hazardous Polymerization:
Will not occur.

Incompatibilities:
Iron, oxidizing agents.

Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>NTP Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanidine Thiocyanate (593-84-0)</td>
<td>Known Anticipated IARC Category</td>
</tr>
<tr>
<td></td>
<td>No No None</td>
</tr>
</tbody>
</table>

12. Ecological Information

Environmental Fate:
No information found.

Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>TSCA EC Japan Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanidine Thiocyanate (593-84-0)</td>
<td>Yes Yes No Yes</td>
</tr>
</tbody>
</table>

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---Chemical Inventory Status - Part 1---
---Chemical Inventory Status - Part 2---

---Canada---
Korea DSL NDSL Phil.
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>RQ</th>
<th>TPQ</th>
<th>List</th>
<th>Chemical Catg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guanidine Thiocyanate (593-84-0)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

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**Chemical Weapons Convention:** No  **TSCA 12(b):** No **CDTA:** No  **SARA 311/312:** Acute: Yes  Chronic: Yes  **Fire:** No  **Pressure:** No  **Reactivity:** No  **(Pure / Solid)**

**Australian Hazchem Code:** None allocated.  **Australian Poison Schedule:** None allocated.  

**WHMIS:**  This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

**NFFA Ratings:**  
Health: 3  Flammability: 1  Reactivity: 0

**Label Hazard Warning:**  
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

**Label Precautions:**  
Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.  
Avoid breathing dust.  
Keep container closed.  
Use only with adequate ventilation.

**Label First Aid:**  
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of contact, wipe off excess material from skin then immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

**Product Use:**  
Laboratory Reagent.

**Revision Information:**  
MSDS Section(s) changed since last revision of document include: 3.

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