MSDS Number: **T4823** * * * * * *Effective Date:* ***11/21/08*** * * * * * *Supercedes:* ***03/16/06***

MSDS **Material Safety Data Sheet**

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

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

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

TRICHLOROACETIC ACID

1. Product Identification

Synonyms: TCA; trichloroethanoic acid
CAS No.: 76-03-9
Molecular Weight: 163.39
Chemical Formula: CCl3COOH
Product Codes:
J.T. Baker: 0414, 0417
Mallinckrodt: 2924, 2928

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Trichloroacetic Acid	76-03-9	100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Life)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation of dust may cause coughing, choking, with variable symptoms of headache, dizziness, and weakness. May cause lung edema.
Ingestion:
Corrosive. Sore throat, severe abdominal pain, vomiting, and tissue damage may occur.
Skin Contact:
Corrosive. Redness, pain, skin burns can occur.
Eye Contact:
Corrosive. Redness, pain, blurred vision can occur. Can cause burns and permanent eye damage.
Chronic Exposure:
Long exposures to acid fumes may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of bronchial pneumonia may also occur.
Aggravation of Pre-existing Conditions:
Persons with skin disorders, eye problems, or respiratory problems may be more susceptible to the effects of this substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool. Water spray will also reduce fumes and irritant gases. Aqueous solutions are acidic and can react with most common metals to release flammable hydrogen gas.
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.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Clean-up personnel need protection against inhalation or contact with substance. Cover spill with excess sodium bicarbonate. Carefully sweep up the material and place in a corrosive resistant container for disposal. If material has mixed with water, after neutralizing material with sodium bicarbonate, absorb with an inert material (e.g., vermiculite, dry sand, earth) and place in a corrosion resistant container. Do not use comustible materials, such as saw dust. Do not flush to sewer.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. 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:
Trichloroacetic acid:
ACGIH Threshold Limit Value (TLV): 1 ppm (TWA)
A3 - Confirmed animal carcinogen with unkown relevance to humans.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. 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):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face respirator with an organic vapor/acid gas cartridge and particulate filter (NIOSH type N95 or better) may be worn for up to ten times the exposure limit or maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor/acid gas cartridge and particulate filter (NIOSH type N100) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. 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 piece 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

Appearance:
White hygroscopic crystals.
Odor:
Pungent odor.
Solubility:
Very soluble in water.
Specific Gravity:
1.6
pH:
1.2
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
198C (388F)
Melting Point:
58C (136F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
1.3 @ 51C (124F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Solutions are acidic. Hygroscopic.
Hazardous Decomposition Products:
Carbon monoxide, carbon dioxide, chloroform, hydrogen chloride, phosgene.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong bases. Heating with alkali yields chloroform and alkali carbonate. Acid solutions in water can react with metals to liberate hydrogen gas.
Conditions to Avoid:
Moisture and incompatibles.

---

11. Toxicological Information

Skin rabbit, standard Draize, 210 ug, mild; eye rabbit, standard Draize, 3500 ug/5S, severe. Investigated as a tumorigen, mutagen, reproductive effector.

```
  --------\Cancer Lists\-----------------------------------------------------
-
                                          ---NTP Carcinogen---
  Ingredient                              Known    Anticipated    IARC
Category
  ------------------------------------   -----    -----------    ------------
-
  Trichloroacetic Acid (76-03-9)          No          No              3
```

12. Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent.
When released into the soil, this material may leach into groundwater.
Environmental Toxicity:
Dangerous to the environment. Very toxic to aquatic organisms; may cause long term adverse effects in the aquatic environment.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. 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

Domestic (Land, D.O.T.)

Proper Shipping Name: TRICHLOROACETIC ACID
Hazard Class: 8
UN/NA: UN1839
Packing Group: II
Information reported for product/size: 110LB

International (Water, I.M.O.)

Proper Shipping Name: TRICHLOROACETIC ACID, SOLID
Hazard Class: 8
UN/NA: UN1839
Packing Group: II
Information reported for product/size: 110LB

International (Air, I.C.A.O.)

Proper Shipping Name: TRICHLOROACETIC ACID, SOLID
Hazard Class: 8
UN/NA: UN1839
Packing Group: II
Information reported for product/size: 110LB

---

15. Regulatory Information

```
  --------\Chemical Inventory Status - Part 1\--------------------------------
--
  Ingredient                                          TSCA  EC   Japan
Australia
  ----------------------------------------------  ----  ---  -----  --------
-
  Trichloroacetic Acid (76-03-9)                    Yes  Yes   Yes      Yes

  --------\Chemical Inventory Status - Part 2\--------------------------------
--
                                                              --Canada--
  Ingredient                                          Korea  DSL   NDSL  Phil.
  ----------------------------------------------  -----  ---   ----  -----
  Trichloroacetic Acid (76-03-9)                    Yes   Yes   No     Yes

  --------\Federal, State & International Regulations - Part 1\--------------
--
                                              -SARA 302-    ------SARA 313----
--
  Ingredient                                  RQ    TPQ     List  Chemical
Catg.
  ----------------------------------------  ---   -----   ----  ------------
--
  Trichloroacetic Acid (76-03-9)            No    No      No         No

  --------\Federal, State & International Regulations - Part 2\--------------
--
                                                         -RCRA-    -TSCA-
  Ingredient                                  CERCLA     261.33     8(d)
  ----------------------------------------  ------     ------    ------
  Trichloroacetic Acid (76-03-9)            No         No         No
```

```
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: 2R
Poison Schedule: S6
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.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe dust.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician immediately.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****
Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.

Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)