Material Safety Data Sheet

Date Printed: 02/JUN/2005
Date Updated: 13/MAR/2004
Version 1.1
According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	TRICHLOROACETIC ACID SIGMA-ALDRICH ULTRA
Product Number	T9159
Company	Sigma-Aldrich Pty, Ltd Unit 2, 14 Anella Avenue Castle Hill NSW 1765 Australia
Technical Phone #	+61 2 9841 0555
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
TRICHLOROACETIC ACID	76-03-9	200-927-2	607-004-00-7

Formula	C2HCl3O2
Molecular Weight	163.39 AMU
Synonyms	Aceto-caustin * Acide trichloracetique (French) * Acido tricloroacetico (Italian) * Amchem grass killer * Konesta * Kyselina trichloroctova (Czech) * NA TA * Sodium TCA solution * Trichloorazijnzuur (Dutch) * Trichloroacetic acid (IUPAC) * Trichloressigsaeure (German) * Trichloroacetic acid (ACGIH) * Trichloroethanoic acid * Trichloromethanecarboxylic acid

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Causes severe burns. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT
In case of contact with eyes, flush with copious amounts of

water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately. Do not induce vomiting.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS
Specific Hazard(s): Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed. Store under nitrogen. Store at 2-8°C

SPECIAL REQUIREMENTS: Hygroscopic.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	1 mg/m3

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	5 mg/m3
		0.75 ppm

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	7 mg/m3
		1 ppm

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	LTEL	5 mg/m3
		1 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Color: White Form: Fine plates	
Property	**Value**	**At Temperature or Pressure**
pH	1	
BP/BP Range	196 °C	760 mmHg
MP/MP Range	54 °C	
Flash Point	113 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	1 mmHg	51 °C
SG/Density	1.62 g/cm3	
Partition Coefficient	Log Kow: 1.645	
Viscosity	N/A	
Vapor Density	< 1 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	900 kg/l	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	27.8 mN/m	80.2 °C
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water:0.5 M in H2O, 20°C complete, colorless	

10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions to Avoid: Moisture.
Materials to Avoid: Strong oxidizing agents, Strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: AJ7875000

ACUTE TOXICITY
LD50
Oral
Rat
3,320 mg/kg

LD50
Subcutaneous
Mouse
270 MG/KG

IRRITATION DATA

Skin
Rabbit
0.21 mg
Remarks: Mild irritation effect

Eyes
Rabbit
3.5 mg
5S
Remarks: Severe irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynxand bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Can cause CNS depression. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

ROUTE OF EXPOSURE
Skin Contact: Causes blisters on contact with skin. Causes burns.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes burns.
Inhalation: May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed. Ingestion can cause immediate burning pain in the mouth, throat, abdomen; severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions.

TARGET ORGAN INFORMATION
Central nervous system.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Mouse
Route of Application: Oral

Exposure Time: 61W
Result: Tumorigenic:Carcinogenic by RTECS criteria. Liver:Tumors.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - MUTAGEN

Mouse
300 MG/KG
Intraperitoneal
24H
Micronucleus test

Mouse
1634 MG/KG
Oral
DNA damage

Mouse
250 MG/KG
Oral
Other mutation test systems

Mouse
125 MG/KG
Intraperitoneal
Cytogenetic analysis

Mouse
500 MG/KG
Oral
Cytogenetic analysis

Mouse
125 MG/KG
Intraperitoneal
5D
sperm

Chicken
200 MG/KG
Intraperitoneal
Cytogenetic analysis

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 3300 MG/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 8 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g.,

reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 6402 MG/KG
Route of Application: Oral
Exposure Time: (1-22D PREG)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

Species: Mouse
Dose: 125 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (5D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology,motility, and count).

12 - Ecological Information

N/A

ELIMINATION
Elimination: 59 %

ECOTOXICOLOGICAL EFFECTS
Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 1,460 - 2,000 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Value: 110 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 20 d
Value: > 1,000 mg/l

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 2,000 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1839
Class: 8
PG: II
Proper Shipping Name: Trichloroacetic acid

IMDG
UN#: 1839
Class: 8
PG: II
Proper Shipping Name: TRICHLOROACETIC ACID, SOLID
Marine Pollutant: No
Severe Marine Pollutant: No

IATA
UN#: 1839
Class: 8
PG: II
Proper Shipping Name: Trichloroacetic acid
Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
ANNEX I INDEX NUMBER: 607-004-00-7
INDICATION OF DANGER: C N
Corrosive. Dangerous for the environment.
R-PHRASES: 35 50/53
Causes severe burns. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S-PHRASES: 26 36/37/39 45 60 61
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany
WGK: 2

SWITZERLAND
SWISS POISON CLASS: 2

16 - Other Information

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

DISCLAIMER