

Material Safety Data Sheet

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Version 1.6

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	2,2,2-TRIFLUOROETHANOL, REAGENTPLUS(TM), >=99%
Product Number	T63002
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
Technical Phone #	+61 2 9841 0555 (1800 800 097)
Fax	+61 2 9841 0500 (1800 800 096)
Emergency Phone #	+44 8701906777 (1800 448 465)

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
2,2,2-TRIFLUOROETHANOL	75-89-8	200-913-6	None
Formula	C2H3F3O		
Molecular Weight	100.04 AMU		
Synonyms	TFE * 2,2,2-Trifluoroethanol * beta,beta,beta-Trifluoroethyl alcohol * 2,2,2-Trifluoroethyl alcohol		

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Flammable. Harmful by inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of serious damage to eyes.

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.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

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

SPECIAL RISKS

Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion can occur under fire conditions. In advanced or massive fires the area should be evacuated and the fire should be fought from a remote explosion-resistant location.

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. Shut off all sources of ignition.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep container closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Store under inert gas.

SPECIAL REQUIREMENTS: Store under inert gas. Moisture sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Wash contaminated clothing before reuse.

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	Physical State: Liquid	
Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	73 - 75 °C	
MP/MP Range	-43.5 °C	
Flash Point	29 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	480 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 5.5 % Upper: 42 %	
Vapor Pressure	70 mmHg	25 °C
SG/Density	1.391 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	3.5 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: Moisture sensitive.

Materials to Avoid: Strong oxidizing agents, Strong acids, Sodium, Potassium.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen fluoride.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: KM5250000

ACUTE TOXICITY

LD50

Oral

Rat

240 mg/kg

LC50
Inhalation
Rat
470 ppm
6H
Remarks: Behavioral:Tremor. Behavioral:Ataxia. Skin and
Appendages: Other: Hair.

LD50
Skin
Rat
1680 mg/kg

LD50
Intraperitoneal
Rat
210 MG/KG

LD50
Oral
Mouse
366 mg/kg
Remarks: Behavioral:Tremor. Lungs, Thorax, or
Respiration:Dyspnea. Gastrointestinal:Changes in structure or
function of salivary glands.

LC50
Inhalation
Mouse
2,900 mg/m3
2H
Remarks: Brain and Coverings:Changes in circulation
(hemorrhage,thrombosis, etc.). Behavioral:General anesthetic.
Lungs, Thorax, or Respiration:Structural or functional change in
trachea or bronchi.

LD50
Intraperitoneal
Mouse
158 MG/KG
Remarks: Behavioral:Change in motor activity (specific assay).

LD50
Intravenous
Mouse
250 MG/KG
Remarks: Behavioral:Change in motor activity (specific assay).

LD50
Skin
Rabbit
390 UL/KG
Remarks: Skin and Appendages:Skin: After systemic exposure:
Dermatitis, other

IRRITATION DATA

Skin
Rabbit
0.75 mg
24H

Remarks: Severe irritation effect

Eyes
Rabbit
20 mg
24H

Remarks: Moderate irritation effect

Eyes
Rabbit
100 mg
20S

Remarks: Rinsed

SIGNS AND SYMPTOMS OF EXPOSURE

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause: Pulmonary edema. Effects may be delayed.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: Harmful if absorbed through skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

CHRONIC EXPOSURE - MUTAGEN

ZINCL
Histidine reversion (Ames)

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (14D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).

Species: Rat
Dose: 150 PPM/6H
Route of Application: Inhalation
Exposure Time: (4W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Rat
Dose: 200 MG/KG
Route of Application: Intraperitoneal
Exposure Time: (4D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Other effects on male.

Species: Dog
Dose: 400 MG/M3/6H

Route of Application: Inhalation
Exposure Time: (8W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct.

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 105 - 135 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 1986
Class: 3
PG: III
Proper Shipping Name: Alcohols, flammable, toxic, n.o.s.

IMDG

UN#: 1986
Class: 3
PG: III
Subrisk: 6.1
Proper Shipping Name: Alcohols, flammable, toxic, n.o.s.
Marine Pollutant: No
Severe Marine Pollutant: No
Technical Name: Required

IATA

UN#: 1986
Class: 3
PG: III
Subrisk: 6.1
Proper Shipping Name: Alcohols, flammable, toxic, n.o.s.
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

INDICATION OF DANGER: Xn
Harmful.

R-PHRASES: 10 20/21/22 37/38 41

Flammable. Harmful by inhalation, in contact with skin and if swallowed. Irritating to respiratory system and skin. Risk of

serious damage to eyes.

S-PHRASES: 26 36 39

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. Wear eye/face protection.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

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. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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