ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Chlorotrifluoromethane
Catalog Number : io-1995
CAS Number : 75-72-9
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Pictogram(s)

>> Warning

GHS Hazard Statements

>> H280 (100%): Contains gas under pressure; may explode if heated [Warning Gases under pressure]

>> H420 (33.9%): Harms public health and the environment by destroying ozone in the upper atmosphere [Warning Hazardous to the ozone layer]

Precautionary Statement Codes

>> P410+P403, and P502

Health Hazards:

>> Exposure may cause nausea, dizziness, and headache, and rapid suffocation. Contact with skin may cause frostbite. (USCG, 1999)

ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Vapors may cause dizziness or asphyxiation without warning, especially when in closed or confined areas.

>> Vapors from liquefied gas are initially heavier than air and spread along ground.

>> Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.

>> Fire may produce irritating, corrosive and/or toxic gases.

>> Special Hazards of Combustion Products: Toxic fumes of Cl and F (USCG, 1999)

ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Some may burn but none ignite readily.

>> Containers may explode when heated.

>> Ruptured cylinders may rocket.

>> CAUTION: Aerosols (UN1950) may contain a flammable propellant.

>> Not combustible. Heating will cause rise in pressure with risk of bursting.

3. Composition/Information On Ingredients

Chemical name : Chlorotrifluoromethane
CAS Number : 75-72-9
Molecular Formula : CClF3
Molecular Weight : 104.4600 g/mol

4. First Aid Measures

First Aid:

>> INHALATION: Remove to fresh air. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen.

>> SKIN: Wash affected areas with warm water. DO NOT USE HOT WATER. (USCG, 1999)

ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> In case of contact with liquefied gas, only medical personnel should attempt thawing frosted parts.

First Aid Measures

Inhalation First Aid

>> Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Skin First Aid

>> ON FROSTBITE: rinse with plenty of water, do NOT remove clothes.

Eye First Aid

>> First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

5. Fire Fighting Measures

>> Excerpt from ERG Guide 126 [Gases - Compressed or Liquefied (Including Refrigerant Gases)]:

>> Use extinguishing agent suitable for type of surrounding fire.

>> SMALL FIRE: Dry chemical or CO2.

>> LARGE FIRE: Water spray, fog or regular foam. If it can be done safely, move undamaged containers away from the area around the fire. Damaged cylinders should be handled only by specialists.

>> FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not direct water at source of leak or safety devices; icing may occur. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. Some of these materials, if spilled, may evaporate leaving a flammable residue. (ERG, 2024)

>> In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep cylinder cool by spraying with water.

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 126 [Gases - Compressed or Liquefied (Including Refrigerant Gases)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> LARGE SPILL: Consider initial downwind evacuation for at least 500 meters (1/3 mile).

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

Evacuation: ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Immediate precautionary measure

>> Isolate spill or leak area for at least 100 meters (330 feet) in all directions.

>> Large Spill

>> Consider initial downwind evacuation for at least 500 meters (1/3 mile).

>> Fire

>> If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Personal protection: self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. Do NOT let this chemical enter the environment.

Accidental Release Measures

Public Safety: ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Many gases are heavier than air and will spread along the ground and collect in low or confined areas (sewers, basements, tanks, etc.).

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

Spill or Leak: ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Do not touch or walk through spilled material.

>> Stop leak if you can do it without risk.

>> Do not direct water at spill or source of leak.

>> Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

>> If possible, turn leaking containers so that gas escapes rather than liquid.

>> Prevent entry into waterways, sewers, basements or confined areas.

>> Allow substance to evaporate.

>> Ventilate the area.

7. Handling And Storage

Safe Storage:

>> Fireproof if in building.

8. Exposure Control/ Personal Protection

MAK (Maximale Arbeitsplatz Konzentration)

>> 4300 mg/m

Emergency Response: ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Use extinguishing agent suitable for type of surrounding fire.

>> Small Fire

>> Dry chemical or CO2.

>> Large Fire

>> Water spray, fog or regular foam.

>> If it can be done safely, move undamaged containers away from the area around the fire.

>> Damaged cylinders should be handled only by specialists.

>> Fire Involving Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Cool containers with flooding quantities of water until well after fire is out.

>> Do not direct water at source of leak or safety devices; icing may occur.

>> Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

>> ALWAYS stay away from tanks in direct contact with flames.

>> Some of these materials, if spilled, may evaporate leaving a flammable residue.

Inhalation Risk:

>> On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

Effects of Short Term Exposure:

>> Exposure could cause narcotic effects. Exposure at high concentrations could cause asphyxiation. The substance may cause effects on the cardiovascular system. This may result in impaired functions.

Fire Prevention

>> NO contact with hot surfaces. See Chemical Dangers.

Inhalation Prevention

>> Use ventilation, local exhaust or breathing protection.

Skin Prevention

>> Cold-insulating gloves.

Eye Prevention

>> Wear safety goggles, face shield or eye protection in combination with breathing protection.

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 126 (Refrigerant gas R-13; Chlorotrifluoromethane)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

Maximum Allowable Concentration (MAK)

>> 1000.0 [ppm]

9. Physical And Chemical Properties

Molecular Weight:

>> 104.46

Exact Mass:

>> 103.9640622

Physical Description:

>> Chlorotrifluoromethane is a colorless odorless gas. It is shipped as a liquefied gas under its own vapor pressure. It is noncombustible. It can asphyxiate by the displacement of air. Contact with the liquid can cause frostbite. Exposure of the container to prolonged heat or fire may cause it to rupture violently and rocket.

>> COLOURLESS LIQUEFIED GAS WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless gas

Odor:

>> Ethereal

Boiling Point:

>> -114 °F at 760 mmHg (USCG, 1999)

>> -81.4 °C

Melting Point:

>> -294 °F (USCG, 1999)

>> -181 °C

Solubility:

>> Water solubility = 60.1 mg/l @ 25 °C

>> Solubility in water: none

Density:

>> Critical density: 0.581 g/cu cm

>> Relative density (water = 1): 1.3

Vapor Density:

>> 1.298 at -22 °F (USCG, 1999) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 3.6

Vapor Pressure:

>> 24816 mmHg (USCG, 1999)

LogP:

>> log Kow = 1.65

>> 1.65

Decomposition:

>> When heated to decomposition it emits highly toxic fumes of ... /hydrogen fluoride and hydrogen chloride/.

Heat of Vaporization:

>> 3996.3 gcal/gmol

Relative Evaporation Rate:

The rate at which a material will vaporize (evaporate, change from liquid to vapor), compared to the rate of vaporization of a specific known material.

>> Heat of Evaporation at boiling point = 14,580 J/kg

10. Stability And Reactivity

>> No rapid reaction with air. No rapid reaction with water.

11. Toxicological Information

Exposure Routes:

>> The substance can be absorbed into the body by inhalation.

Inhalation Exposure

>> Confusion. Dizziness. Headache. Unconsciousness.

Skin Exposure

>> ON CONTACT WITH LIQUID: FROSTBITE.

Eye Exposure

>> See Skin.

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Neurotoxin - Acute solvent syndrome

>> Other Poison - Simple Asphyxiant

Antidote and Emergency Treatment:

>> For immediate first aid: Ensure that adequate decontamination has been carried out. If victim is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep victim quiet and maintain normal body temperature. Obtain medical attention. /Chlorinated fluorocarbons/

Human Toxicity Excerpts:

>> EARLY...HUMAN EXPERIENCE INDICATED THAT HIGH VAPOR CONCN (EG, 20%) MAY CAUSE CONFUSION, PULMONARY IRRITATION, TREMORS & RARELY COMA, BUT THAT THESE EFFECTS WERE GENERALLY TRANSIENT & WITHOUT LATE SEQUELAE. ...CAUSE OF DEATH /FROM ABUSE OF FLUOROCARBONS/ IS IN CONSIDERABLE DOUBT... FREEZING OF AIRWAY SOFT TISSUES CAN PROBABLY BE ELIMINATED AS A CAUSE OF DEATH EXCEPT IN CASES WHERE THE PRODUCT WAS SPRAYED DIRECTLY INTO THE MOUTH FROM ITS CONTAINER OR FROM A BALLOON CONTAINING SOME LIQUID. LARYNGEAL SPASM OR EDEMA, OXYGEN DISPLACEMENT, OR SENSITIZATION OF MYOCARDIUM ENDOGENOUS CATECHOLAMINES WITH SUBSEQUENT VENTRICULAR FIBRILLATION APPEAR TO BE REASONABLE POSSIBILITIES. /FLUOROCARBON REFRIGERANTS & PROPELLANTS/

Non-Human Toxicity Excerpts:

>> EARLY ANIMAL...EXPERIENCE INDICATED THAT HIGH VAPOR CONCN (EG, 20%) MAY CAUSE CONFUSION, PULMONARY IRRITATION, TREMORS & RARELY COMA, BUT THAT THESE EFFECTS WERE GENERALLY TRANSIENT & WITHOUT LATE SEQUELAE. /FLUOROCARBON REFRIGERANTS & PROPELLANTS/

12. Ecological Information

ICSC Environmental Data:

>> Avoid release to the environment because of its impact on the ozone layer.

13. Disposal Considerations

Spillage Disposal

>> Personal protection: self-contained breathing apparatus. Ventilation. NEVER direct water jet on liquid. Do NOT let this chemical enter the environment.

14. Transport Information

DOT

Chlorotrifluoromethane
2.2

IATA

Chlorotrifluoromethane
2.2,

15. Regulatory Information

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Methane, chlorotrifluoro-

New Zealand EPA Inventory of Chemical Status

>> Chlorotrifluoromethane: Non hazardous

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> ALL FLUOROCARBONS WILL UNDERGO THERMAL DECOMPOSITION WHEN EXPOSED TO FLAME OR RED-HOT METAL. DECOMPOSITION PRODUCTS OF THE CHLOROFLUOROCARBONS WILL INCLUDE HYDROFLUORIC & HYDROCHLORIC ACID ALONG WITH SMALLER AMOUNTS OF PHOSGENE & CARBONYL FLUORIDE. THE LAST COMPOUND IS VERY UNSTABLE TO HYDROLYSIS & QUICKLY CHANGES TO HYDROFLUORIC ACID & CARBON DIOXIDE IN THE PRESENCE OF MOISTURE. /FLUOROCARBONS/

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."