

SAFETY DATA SHEETS

According to the UN GHS revision 10

Version: 1.1
Creation Date: July 15, 2024
Revision Date: February 06, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Freon #21

1.2 Other means of identification

Product number C1824581
Other names Dichloromonofluoromethane; Methane, dichlorofluoro-

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word Danger
Hazard statement(s) H280 Contains gas under pressure; may explode if heated
Precautionary statement(s)
Prevention none
Response none
Storage none
Disposal none

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Freon #21	Dichlorofluoromethane	75-43-4	200-869-8	≈ 99%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

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

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

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

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

INHALATION: May cause giddiness, light-headedness, disorientation, nausea, vomiting, narcosis, cardiac dysrhythmias, hypotension, and death. SKIN: May cause frostbite or irritation. EYES: May cause irritation or cold injury. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as 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 patient quiet and maintain normal body temperature. Obtain medical attention. Chlorinated fluorocarbons (CFCs) and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

If material involved in fire: Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic fumes of chlorine and fluorine may be produced in fire. (USCG, 1999)

5.3 Special protective actions for fire-fighters

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

If Refrigerant 21 is spilled or leaked, the following steps should be taken: 1. Ventilate area of spill or leak. 2. If the gas is leaking, stop the flow. 3. If the liquid is spilled or leaked, allow to vaporize.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof if in building.... MATERIALS MUST BE STORED IN PLACES THAT ARE COOL ... PROVIDE ADEQUATE VENTILATION ... FURTHER PRECAUTION IS TO LOCATE ... AREA ... AWAY FROM AREAS OF FIRE HAZARD .

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 10 ppm as TWA.MAK: 43 mg/m³, 10 ppm; peak limitation category: II(2)

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles or eye protection in combination with breathing protection.

Skin protection

Cold-insulating gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Dichlorofluoromethane is a colorless, odorless gas. It is shipped as a liquid under its own vapor pressure. Contact with the liquid may cause frostbite to unprotected skin. It can asphyxiate by displacement of air. Exposure of the container to prolonged heat or fire may cause it to rupture violently and rocket.
Colour	Colorless heavy gas
Odour	... Slight ether-like odor ...
Melting point/freezing point	-135°C
Boiling point or initial boiling point and boiling range	8.9°C
Flammability	Nonflammable Gas
Lower and upper explosion limit/flammability limit	no data available
Flash point	130-132°C/3mm
Auto-ignition temperature	1022° F (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	0.313 cP at 25 deg C (liq); 0.0114 cP at 25 deg C, 101.3 kPa ... /gas/
Solubility	0.7 % at 86° F (NIOSH, 2016)
Partition coefficient n-octanol/water	log Kow = 1.55
Vapour pressure	2217.93 mm Hg (USCG, 1999)
Density and/or relative density	1.35
Relative vapour density	3.82 (Air = 1)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating. This produces corrosive and highly toxic fumes (hydrogen chloride - see ICSC 0163, hydrogen fluoride - see ICSC 0283 and phosgene - see ICSC 0007). Reacts with powdered aluminium, zinc and magnesium. Reacts with acids and acid fumes. This produces highly toxic fumes of chlorides and fluorides. Attacks some forms of plastic, rubber and coatings.

10.2 Chemical stability

Condition/ contributing to instability: heat.

10.3 Possibility of hazardous reactions

WEAKLY FLAMMABLE. The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. DICHLOROFLUOROMETHANE is incompatible with the following: Chemically-active metals such as sodium, potassium, calcium, powdered aluminum, zinc & magnesium; acid; acid fumes (NIOSH, 2016).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Incompatibilities: Reacts violently with chemically active metals: sodium, potassium, calcium, powdered aluminum, zinc, magnesium, alkali, alkaline earth. Reacts with acids or acid fumes producing highly toxic chlorine and fluorine fumes. Attacks some forms of plastics, rubber, and coatings.

10.6 Hazardous decomposition products

When heated to decomposition it emits very toxic fumes of chloride and fluoride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: LC50 Rat inhalation 49,900 ppm 4 hr

- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The liquid may cause frostbite. The substance may cause effects on the central nervous system at high concentrations. Exposure far above the OEL could cause cardiac dysrhythmia.

STOT-repeated exposure

The substance may have effects on the liver.

Aspiration hazard

A harmful concentration of this gas in the air will be reached very quickly on loss of containment.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Complete degradation of dichlorofluoromethane, initially present at approximately 95 ppm, by methanotrophic bacteria occurred within approximately 19 days in soil samples collected from an agricultural field(1) when methane was added to the soil(1). In soil samples collected from a forest, complete degradation of dichlorofluoromethane, initially present at approximately 26 ppm, by methanotrophic bacteria occurred within approximately 5 days when methane was added to the soil(1). In batch experiments using soil pre-exposed to landfill gas incubated with methane and air, dichlorofluoromethane degraded with an oxidation rate 0.509 ug/g soil-hour(2). Dichlorofluoromethane, present at 11.6 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at a reported concentration of sludge of 1 drop/L in the Japanese MITI test(3).[(1) Oremland RS et al; Appl Environ Microbiol 62: 1818-21 (1996) (2) Scheutz C et al; J Environ Qual 33: 61-71 (2004) (3) NITE; Chemical Risk Information Platform (CHRIP). Biodegradation and Bioconcentration. Tokyo, Japan: Natl Inst Tech Eval. Available from, as of Dec 10, 2014: <http://www.safe.nite.go.jp/english/db.html>] Full text: PMC167957

12.3 Bioaccumulative potential

An estimated BCF of 5 was calculated for dichlorofluoromethane in fish(SRC), using a log Kow of 1.55(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low. The BCF of dichlorofluoromethane is reported as low using carp (Cyprinus carpio) which were exposed over an 8-week period (actual BCF value not reported)(4).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc for dichlorofluoromethane can be estimated to be 32(SRC). According to a classification scheme(2), this estimated Koc value suggests that dichlorofluoromethane is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1029 (For reference only, please check.) IMDG: UN1029 (For reference only, please check.) IATA: UN1029 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21) (For reference only, please check.) IMDG: DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21) (For reference only, please check.) IATA: DICHLOROFLUOROMETHANE (REFRIGERANT GAS R 21) (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 2.2 (For reference only, please check.) IMDG: 2.2 (For reference only, please check.) IATA: 2.2 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: (For reference only, please check.) IMDG: (For reference only, please check.) IATA: (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Dichlorofluoromethane	Dichlorofluoromethane	75-43-4	200-869-8
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Not Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2024
Revision Date February 06, 2025

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>



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- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
 - IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
 - eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
 - CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
 - ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
 - ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
 - Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
 - ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death. Check oxygen content before entering the area. There is no odour warning even when toxic concentrations are present. Do NOT use in the vicinity of a fire or a hot surface, or during welding. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.