ChemicalBook

Chemical Safety Data Sheet MSDS / SDS

Difluorochloromethane

Revision Date:2025-01-11 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name	: Difluorochloromethane
CBnumber	: CB5385223
CAS	: 75-45-6
EINECS Number	: 200-871-9
Synonyms	: R22,chlorodifluoromethane

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	: For R&D use only. Not for medicinal, household or other use.
Uses advised against	: none

Company Identification

Company	: Chemicalbook
Address	: Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone	: 010-86108875

SECTION 2: Hazards identification

Classification of the substance or mixture

Not classified.

Label elements

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

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Difluorochloromethane
Synonyms	: R22,chlorodifluoromethane
CAS	: 75-45-6
EC number	: 200-871-9
MF	: CHClF2
MW	: 86.47

SECTION 4: First aid measures

Description of 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.

Most important symptoms and effects, both acute and delayed

Inhalation at greater than 10% concentration in air may cause narcosis. Liquid may cause frostbite. (USCG, 1999)

Indication of any immediate medical attention and special treatment needed

Victims of freon inhalation require management for hypoxic, CNS anesthetic, & cardiac symptoms. Patients must be removed from the exposure environment, & high flow supplemental oxygen should be utilized. The respiratory system should be evaluated for injury, aspiration, or pulmonary edema & treated appropriately. CNS findings should be treated supportively. A calm environment with no physical exertion is imperative to avoid increasing endogenous adrenegic levels. Exogenous adrenergic drugs must not be used to avoid inducing sensitized myocardial dysrhythmias. Atropine is ineffective in treating bradyarrhythmias. For ventricular dysrhythmias, diphenylhydantoin & countershock may be effective. Cryogenic dermal injuries should be treated by water bath rewarming at 40-42 deg C until vasodilatory flush has returned. Elevation of the limb & standard frostbite management with late surgical debridement should be utilized. Ocular exposure requires irrigation & slit lamp evaluation for injury. Freons

SECTION 5: Firefighting measures

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.

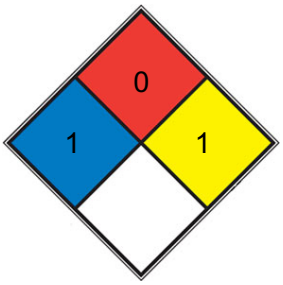
Specific Hazards Arising from the Chemical

Special Hazards of Combustion Products: Decomposition gases are toxic and irritating. (USCG, 1999)

Advice for firefighters

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

NFPA 704



■	HEALTH	1	Exposure would cause irritation with only minor residual injury (e.g. acetone, sodium bromate, potassium chloride)
■	FIRE	0	Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 820 °C (1,500 °F) for a period of 5 minutes.(e.g. Carbon tetrachloride)
■	REACT	1	Normally stable, but can become unstable at elevated temperatures and pressures (e.g. propene)
□	SPEC. HAZ.		

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Ventilation.

Environmental precautions

Ventilation.

Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. 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.

Conditions for safe storage, including any incompatibilities

Fireproof. Cool. Ventilation along the floor.Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 1000 ppm as TWA; A4 (not classifiable as a human carcinogen).MAK: 1800 mg/m3, 500 ppm; peak limitation category: II(8); pregnancy risk group: C.EU-OEL: 3600 mg/m3, 1000 ppm as TWA

Biological limit values

no data available

Exposure controls

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

Individual protection measures

Eye/face protection

Wear safety goggles.

Skin protection

Cold-insulating gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Colorless, nearly odorless, nonflammable gas
Colour	Colorless gas ... [Note: Shipped as a liquefied compressed gas]
Odour	Nearly odorless
Melting point/freezing point	-146°C
Boiling point or initial boiling point and boiling range	-40.8°C

Flammability	Nonflammable Gas
Lower and upper explosion limit/flammability limit	no data available
Flash point	no data available
Auto-ignition temperature	Not flammable (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	0.23 mN/sec/sq m at 25 deg C (liquid); 0.013 mN/sec/sq m at 25 deg C (gas)
Solubility	0.3 % at 77° F (NIOSH, 2016)
Partition coefficient n-octanol/water	log Kow = 1.08
Vapour pressure	10991.42 mm Hg (USCG, 1999)
Density and/or relative density	1.17
Relative vapour density	3 (Air = 1)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes on contact with hot surfaces or flames. This produces toxic and corrosive gases including hydrogen chloride (see ICSC 0163), phosgene (see ICSC 0007), hydrogen fluoride (See ICSC 0283) and carbonyl fluoride (See ICSC 0633). Attacks magnesium and its alloys.

Chemical stability

The product is stable.

Possibility of hazardous reactions

Not flammable.The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen.CHLORODIFLUOROMETHANE is incompatible with the following: Alkalis, alkaline earth metals (e.g., powdered aluminum, sodium, potassium, zinc) (NIOSH, 2016).

Conditions to avoid

no data available

Incompatible materials

In a dichlorodifluoromethane system, frictional wear exposed fresh metal surfaces on an aluminum compressor impellor, causing an exothermic reaction which melted much of the impellor. Later tests showed similar results ... with ... chlorodifluoromethane .

Hazardous decomposition products

Decomposes on contact with hot surfaces or flames. This produces toxic and corrosive gases including hydrogen chloride, phosgene, hydrogen fluoride and carbonyl fluoride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: LC50 Mouse inhalation 28 parts per hundred (pph)/20 minutes
- 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

Evaluation: There is inadequate evidence in humans for the carcinogenicity of chlorodifluoromethane. There is limited evidence in experimental animals for the carcinogenicity of chlorodifluoromethane. Overall evaluation: Chlorodifluoromethane is not classifiable as to its carcinogenicity in humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the cardiovascular system and central nervous system. This may result in cardiac disorders and central nervous system depression. Exposure could cause lowering of consciousness. See Notes.

STOT-repeated exposure

no data available

Aspiration hazard

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

SECTION 12: Ecological information

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

Persistence and degradability

AEROBIC: Chlorodifluoromethane, present at 1.69 mg/L, reached 0% of its theoretical BOD in 4 weeks using an activated sludge inoculum at 2 mg/L in the Japanese MITI test(1). The maximum oxidation rate measured for chlorodifluoromethane in aerobic soil microcosms incubated with methane and air to simulate the gas composition in landfill soil covers was 0.343 mg/g soil-hour(2).

Bioaccumulative potential

An estimated BCF of 2.4 was calculated in fish for chlorodifluoromethane(SRC), using a log Kow of 1.08(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(SRC).

Mobility in soil

The Koc of chlorodifluoromethane is estimated as 8.6(SRC), using a log Kow of 1.08(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that chlorodifluoromethane is expected to have very high mobility in soil. However, since chlorodifluoromethane is a gas(4) under ambient conditions, most of the chemical released on soil will volatilize rapidly, effectively reducing the potential for leaching into groundwater(SRC).

Toxics Screening Level

The current ITSL for Chlorodifluoromethane is 50,000 µg/m3, with annual averaging time (AT).

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN1018 (For reference only, please check.)

IMDG: UN1018 (For reference only, please check.)

IATA: UN1018 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22) (For reference only, please check.)

IMDG: CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22) (For reference only, please check.)

IATA: CHLORODIFLUOROMETHANE (REFRIGERANT GAS R 22) (For reference only, please check.)

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.)

Packing group, if applicable

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

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

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

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.The odour warning when the exposure limit value is exceeded is insufficient.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.