

# An Introduction to Properties of Chlorophorous Carbons

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**Abstract:** **Chlorofluorocarbon (CFC)**, any of several organic compounds composed of carbon, fluorine, and chlorine. When CFCs also contain hydrogen in place of one or more chlorines, they are called hydrochlorofluorocarbons, or HCFCs. CFCs are also called Freons, a trademark of the E.I. du Pont de Nemours & Company in Wilmington, Del. CFCs were originally developed as refrigerants during the 1930s. Some of these compounds, especially trichlorofluoromethane (CFC-11) and dichlorodifluoromethane (CFC-12), found use as aerosol-spray propellants, solvents, and foam-blowing agents. (britannica.com). The following article aims to discuss the properties of CFC's that includes structure, applications and other issues.

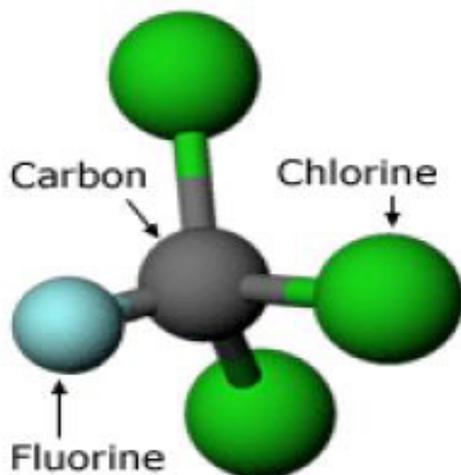
**Key Words:** ozone, CFCs, refrigerant, properties

## Introduction:

Properties:

1. They are nonflammable
2. They are non toxic
3. When released in air they occupy stratosphere and create holes in the ozone layer
4. They can be used as refrigerant in the refrigerator.
5. They are hazardous due to active in the depletion of ozone layer.

### Structure of CFCs



(Source: Internet)

### Molecule arrangement:

Common name	141b	1,1,1-TCA	113
Scientific name	HCFC 141b	CFC 140a	CFC 113
Atomic name	$C_2H_3Cl_2$	$C_2H_3Cl_3$	$C_2F_3Cl_3$
Atom arrangement diagram	$\begin{array}{c} H \quad Cl \\   \quad   \\ H - C - C - H \\   \quad   \\ H \quad Cl \end{array}$	$\begin{array}{c} Cl \quad H \\   \quad   \\ Cl - C - C - H \\   \quad   \\ Cl \quad H \end{array}$	$\begin{array}{c} Cl \quad F \\   \quad   \\ F - C - C - Cl \\   \quad   \\ Cl \quad F \end{array}$
Molecular Model			
Hansen Solubility Parameter			
Disperse	6.0	16.8	14.7
Polar	12.9	4.3	1.6
Hydrogen-bonding	2.1	2.0	0.0

Source (Internet)

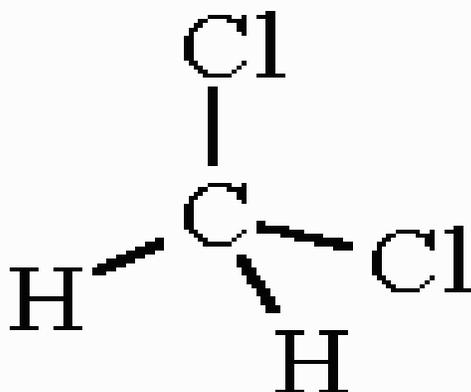
## Types of CFCs

1. Name: Dichloromethane
2. Molecular formula:  $\text{CH}_2\text{Cl}_2$
3. Molecular Weight: 84.93 g/mol
4. Density of Dichloromethane:  $1.3266 \text{ g/cm}^3$

## Uses of Dichloromethane

1. Used as a solvent in food processing
2. Used in Aerosol formulations
3. It is used as degreasing agent

## Atom Arrangement

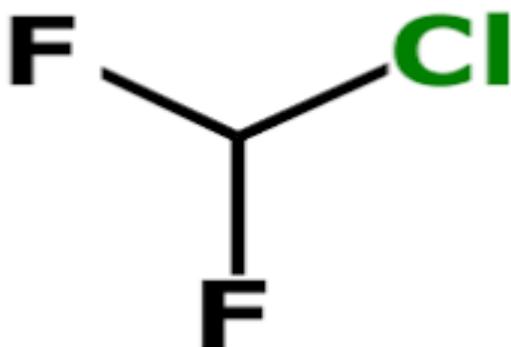


1. Name: Feron22
2. Molecular formula:  $\text{CHClF}_2$
3. Boiling point:  $-40.9 \text{ }^\circ\text{C}$
4. ChemSpider ID: 6132
5. Density:  $3.66 \text{ g/cm}^3$
6. Molar mass:  $86.47 \text{ g/mol}$

## Uses of Freon 22

1. It is commonly used in Refrigerators, Air conditioners and car AC systems
2. Used in various industries for heating purposes
3. In cold storage also it is used for freezing.

## Atom Arrangement.



**Discussion:** Due to use of CFCs in many industries the depletion of ozone layer is causing huge problems by spoiling the stratosphere. If the stratosphere is spoiled the rays of the sun directly enter the earth and heat is more and a bit dangerous causing skin burn and other diseases such as skin cancer. In 1970 Sherwood Ronald, Malino and Dutch chemist Paul Curtzen, found that once the CFCs are released in air they occupy the stratosphere and cause its depletion resulting into holes on the stratosphere layer. Single chlorine atom released in the ozone layer converts thousands of ozone atoms to oxygen causing global warming. Montreal Protocol started in 1987 by USA and Canada was helpful to reduce use of CFCs in almost all industries. The good news is they are replaced by other chemicals and as they were popular due to their property of non toxic and non flammable.

## References:

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