

Naming Convention for CFCs & Halons

Please note: you *will not* be tested on this information!

It is provided in case anyone is interested 😊

Chlorofluorocarbons (**CFCs**) are nontoxic, nonflammable chemicals containing atoms of **C**hlorine, **F**luorine, and **C**arbon. They had been used in the manufacture of aerosol sprays, blowing agents for foams and packing materials, as solvents, and as refrigerants. CFCs are classified as halocarbons, a class of compounds that contain atoms of carbon and halogen atoms. Hydrochlorofluorocarbons (**HCFCs**) contain **H**ydrogen, **C**hlorine, **F**luorine, and **C**arbon and, due to their H atom, are reactive in the troposphere (the H reacts with OH to form H₂O).

Individual CFC and HCFC molecules are labeled with an archaic numbering system consisting of three integers: i , j , and k . *If only two integers are given, the value of the first integer is zero.* The digits correspond to:

i : number of carbon atoms minus 1

j : number of hydrogen atoms plus 1

k : number of fluorine atoms

The number of chlorine atoms is found by $Cl = 2(C+1) - H - F$, where C, H, & F represent the number of Carbon, Hydrogen, and Fluorine atoms.

Hence:

CFC-11 (CFCl₃) has $i + 1 = 1$ Carbon atom, $j - 1 = 0$ Hydrogen atoms, $k = 1$ Fluorine atom, and $2(1+1) - 0 - 1 = 3$ Chlorine atoms.

CFC-12 (CF₂Cl₂) has $i + 1 = 1$ Carbon atom, $j - 1 = 0$ Hydrogen atoms, $k = 2$ Fluorine atom, and $2(1+1) - 0 - 2 = 2$ Chlorine atoms.

HCFC-142 (C₂H₃F₂Cl) has $i + 1 = 2$ Carbon atoms, $j - 1 = 3$ Hydrogen atoms, $k = 2$ Fluorine atom, and $2(2+1) - 3 - 2 = 1$ Chlorine atom.

Halons are fluorocarbons that contain at least one bromine and no hydrogen. The nomenclature for naming halons is simpler than CFCs, because halons use $ijkl$, where i = number of carbon atoms, j = number of fluorine atoms, k = number of chlorine atoms, and l = number of bromine. For example, Halon-2402 is C₂F₄Br₂ and Halon-1211 is CF₂ClBr.