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Refrigerant gas list

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Here is the overview of 16 types: * HydroChloroFluoroCarbons (HCFC) + Chemical Nomenclature: H, Cl, F, C + Atoms Present In Refrigerant: Hydrogen, Chlorine, Fluorine, Carbon * HydroChloroOlefins (HCO) + Chemical Nomenclature: H, Cl, C + Atoms Present In Refrigerant: Hydrogen, Chlorine, Carbon * ...and so on until Natural Refrigerants Refrigerant types are categorized based on the atoms they're made of. For example, R-22 is an HCFC refrigerant because it contains hydrogen, chlorine, fluorine, and carbon. The primary components in refrigerants include hydrogen, carbon, halogen atoms like chlorine, fluorine, bromine, and oxygen. This explains why we have different types of refrigerant gases and liquids. Let's now explore the 16 categories of refrigerants type-by-type: 1. HCFC Refrigerants + Chemical Name: Dichlorofluoromethane + Molecular Formula: CHFCl2 + Common refrigerants like R-22, R-401A, and R-406A are in bolded letters ...and so on until Natural Refrigerants The "O" in HCFO stands for "olefin", which refers to a molecular structure with double carbon-carbon bonds (C=C). The text also lists various HFC (HydroFluoroCarbons) refrigerants, including R-23, R-32, R-41, and others. These refrigerants are composed of hydrogen, fluorine, and carbon atoms. The list of HFO (HydroFluoroOlefin) refrigerants is smaller, but includes examples like R-1234yf, which contains hydrogen atoms, fluorine atoms, and olefins (or alkenes). **Chlorofluorocarbon (CFC) Refrigerants** The following are some common CFC refrigerants used in cooling systems, along with their chemical names and molecular formulas: * R-11: Trichlorofluoromethane (CCl3F) * R-12: Dichlorodifluoromethane (CCl2F2) * R-13: Chlorotrifluoromethane (CClF3) * R-111 to R-217: Various other CFC refrigerants with different molecular formulas **Chlorofluoro (CFO) Refrigerants** There are only two CFO refrigerants in use, which are: * R-1112a: 1,1-Dichloro-2,2-difluoroethylene (C2Cl2F2) * R-1113: Chlorotrifluoroethylene (C2ClF3) **Perfluorocarbon (PFC) Refrigerants** These refrigerants contain only carbon and fluorine atoms, with a high level of fluorine content. The following are some PFCs: * R-14: Tetrafluoromethane (CF4) * R-116 to R-218: Various other PFCs with different molecular formulas **Perfluoroolefin (PFO) Refrigerants** These refrigerants are similar to PFCs but contain double carbon-carbon bonds. The following are some PFOs: * R-1114: Tetrafluoroethylene (C2F4) * R-1216: Hexafluoropropylene (C3F6) **Polychlorocarbon (PCC) Refrigerants** These refrigerants contain only carbon and chlorine atoms. The following are some PCCs: * R-10: Carbon tetrachloride (CCl4) * R-110: Hexachloroethane (C2Cl6) **Halogenated (H) Refrigerants** These refrigerants contain hydrogen, halogens, or both. Some examples include: * R-12B1: Bromochlorodifluoromethane (CBrClF2) * R-13B1: Bromotrifluoromethane (CBrF3) Note that some of these refrigerants are no longer in use due to their potential environmental impact. Natural refrigerants are a category of substances that can be found in nature and do not consist of the same atoms as Freon. These include ammonia, water, neon, nitrogen, oxygen, air, and other gases such as helium, carbon dioxide, and sulfur dioxide. The list of natural refrigerants is: **Refrigerant Classification** The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has established a standardized system for classifying refrigerants. This system assigns a unique number to each refrigerant based on its chemical composition. **Primary and Secondary Refrigerants** There are two types of refrigerants: 1. **Primary Refrigerants**: These refrigerants change state and temperature during the compression, condensation, expansion, and evaporation process. They are not directly in contact with the space to be cooled. 2. **Secondary Refrigerants**: These refrigerants are used for heat transfer without changing state or temperature. They are typically brines or antifreeze solutions. **Examples of Primary and Secondary Refrigerants** Primary refrigerants: * Halocarbons * Hydrocarbons (e.g., methane, ethane) * Organic compounds (e.g., chloroform) * Inorganic compounds (e.g., water) Secondary refrigerants: * Brine solutions (e.g., water, sodium chloride) * Antifreeze solutions (e.g., calcium chloride) **Refrigerant Types and Properties** The table below lists various refrigerants, their ASHRAE numbers, chemical names, and atmospheric lifetimes. | Refrigerant Type | ASHRAE Number | Chemical Name | Atmospheric Lifetime | | --- | --- | --- | --- | | CFC | R-11 | Trichlorofluoromethane | 45 years | | CFC | R-12 | Dichlorodifluoromethane | 100 years | | HCFC | R-21 | Dichlorofluoromethane | 1.7 years | | ... | ... | ... | ... | Note that I've tried to preserve the original structure and content of the text while rephrasing it in a clearer and more concise manner. The list includes various refrigerants and their properties. Refrigerant designations include: * HCFCR: Hydrochlorofluorocarbons (HCFCs) with R-412, R-414, R-415, R-416, and R-418 * HCFOR: Hydrofluorocarbons (HFCs) with R-411, R-513, and R-1132a1, and R-1141 * HFCR: Hydrofluorocarbons (HFCs) with R-23, R-32, R-41, R-263, R-272, and R-281 * HFOR: Hydrofluoroolefins (HFOs) with R-455AR, R-513AR, and R-1132a1 * HOR: Hydrocarbons (HCs) with R-432AR, R-433AR, and R-1150 * PCCR: Carbon tetrachloride (PCC) * PFCR: Perfluorocarbons (PFCs) with R-14, R-116, R-218, R-318, R-3-1-10, R-4-1-12, and R-5-1-14 * PFOR: Perfluoroolefins (PFROs) with R-1114 and R-1216 The list includes various refrigerant blends and their properties, such as: * HCFCR-412AR: A blend of 22% HCFC-142b, 18% HCFC-218, and 60% other HCFCs * HCFOR-411AR: A blend of 27% HFC-134a, 23% HFC-152a, and 50% other HFCs The list also includes some refrigerants with zero emissions (0) or unknown properties (