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Improving the Classification of Freons Based on Their Chemical Composition

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ANNOTATION: The article focuses on freons and their chemical composition and their classification stages. The use of Freon's and its positive and negative effects on the human condition. Freon is chemically inert, its condition in the air under normal home conditions, it is explosive and completely harmless to humans.

KEYWORDS: Freon, chlorine atoms, chemicals, atmosphere, ammonia, thermostatic valve.

I. INTRODUCTION

Freons or haloalkanes are derivatives of saturated hydrocarbons (methane and ethane) containing fluorine and chlorine. In the molecules of these compounds, several hydrogen atoms are replaced by fluorine, chlorine, or, in rare cases, bromine atoms. These freons are relatively inexpensive, less toxic, and non-flammable. Their widespread use has been facilitated by their physicochemical properties, which are very suitable for freon. Today, many companies produce a variety of refrigerators. But the largest distribution was received by about 50 types of refrigerators. The R symbol (from the English refrigerator) is used to identify the refrigerator. The first number in the abbreviation is the number of fluorine atoms in the compound; the second is the number of hydrogen atoms in the compound and plus one; the third is the number of carbon atoms in the compound minus one (not shown in the abbreviation zero for methane series compounds). The number of chlorine atoms is determined by subtracting the total number of fluorine and hydrogen atoms from the total number of atoms that can combine with carbon atoms (the valence C is assumed to be four). Thus, the chemical structure of freon R12 is characterized by the formula $F_2 - C - Cl_2$. If bromine is in place of chlorine, the letter B and a number indicating the number of bromine atoms in the molecule are placed at the end of the identification number. Refrigerant R134a had a higher value of saturated vapor pressure at 45 ° C compared to R12. This led to a deterioration of its energy performance in low temperature units, but in air conditioning systems the value of the cooling coefficient for R134a could not only reach the R12 parameter, but also exceed it. Freon R141b can be used in both air conditioners and heat pumps. According to its characteristics, it was close to R11 and R113. Freon R227ea found application as one of the components of several Freons working fluids - 50-60 years ago they started using multicomponent compounds (azeotropic and azeotropic - separate and integral) to improve environmental properties. About the creation and name of Freons (Freons) Freon was first isolated and synthesized in 1928. This was done by Thomas Midgley, an American chemist at General Motors Corporation, and in his laboratory he obtained a chemical compound, later renamed Freon. Some time later, the Kinetic Chemical Company, which is engaged in the industrial production of the new Freon-12 gas, introduced the symbol (Refrigerator - refrigerator, refrigerator) with the letter R of the refrigerator. It was this name that became widespread, and over time the full name of the refrigerators began to be written in the composite version - the manufacturer's trademark and the generally accepted label of the refrigerator. The concept of freon itself is a gas or liquid (depending on environmental parameters), which is colorless and has no distinct odor. Freon is chemically inert, does not burn in air under normal household conditions, it is explosive and completely harmless to humans. In addition to refrigeration machines and appliances (refrigerators), freon is used as an outlet base in gas containers, for the production of aerosols in perfumery, for extinguishing fires, and as a foaming agent (agent) in the production of polyurethane (thermal insulation, co. 'pick rubber, etc.). Chemically - freons are haloalkanes, fluorinated derivatives of saturated hydrocarbons (mainly methane and ethane), used as refrigerants in refrigeration machines (e.g. in air conditioners). Chemically, freons are very inert. Freon is not only flammable in air, but also does not explode when in contact with an open flame. However, if freon is heated above 250



° C, highly toxic products are formed. However, their chemical stability makes them relatively safe and non-toxic, as well as responsible for their environmental damage. Since 1975, it has been believed that freons can indirectly affect the stratosphere's ozone layer through their ability to deliver halogens, especially chlorine, to this level. Some of the atmospheric chemistry that is thought to have formed and some of the measurements made in the ozone layer will be considered in conjunction with efforts to regulate the environment. This leads to the rapid cessation of a number of industrial chemicals, including freons. In the United States, CFC production was discontinued on December 31, 1995 due to the harmful effects of the atmosphere on the ultraviolet radiation shield (ozone) .1-3 However, these compounds are still on sale and some areas are in stock. materials. Hydrogen chlorofluorocarbons (HCFCs) that can be used instead of CFC are currently being produced with a cessation of production in 2020 because of their impact on the ozone layer. At that time, hydrogen fluoride hydrocarbons (HFC) will replace HCFC and CFCs. More than 40 different freons are known worldwide; most of them are available commercially. Harm of Freon and Its Effect on the Ozone Layer: Refrigerators used in household appliances are non-flammable and harmless to humans. R-12, R-22 freons are often used in industry. Freon-22, by "harmful" measurements, belongs to hazard class 4 substances. At a significant concentration of these freons in a person becomes drowsiness, confusion, weakness, excitement. May touch skin in liquid phase. New freons (R134A, R-404, R407C, R507C, R410A, etc.) are safe for people and the environment, so all climate technology manufacturers use these freon brands. The reason for the depletion of ozone in the stratosphere and the formation of ozone holes is the production and use of freons containing chlorine and bromine. Once used in the atmosphere, they decompose under the influence of the sun's ultraviolet rays. The extracted components are actively interacting with ozone in the halogen cycle of atmospheric ozone decomposition. Due to the harmful effects of ozone-depleting R22 freon, its use in the U.S. and Europe is declining year by year, where the use of this freon has been officially banned since 2010. Russia also bans the import of refrigeration equipment, including industrial and semi-industrial air conditioners. R22 freon should be replaced with R410A freon as well as R407C. The signing and ratification of the Montreal Protocol by UN countries has led to a decline in the production of ozone-depleting freons and will help restore the Earth's ozone layer. A measure was introduced to measure the "harmfulness" of Freons, in which the ozone-depleting potential of R-13 freon, which most older refrigerators operate, was taken as a unit. The potential of R-22 freon is 0.05, while the potential of the new ozone-compatible R-407C and R-410A freons is zero. Therefore, to date, most manufacturers focused on the European market have been forced to switch to the production of air conditioners using 407C and R-410A freons, which are suitable for ozone. For consumers, this transition meant an increase in both the cost of equipment and the cost of installation and maintenance work. This is because the new freons differ from the usual R-22 in their properties. The condensing pressure of the new freons is higher - up to 26 atmospheres instead of 16 atmospheres for R-22 freon. Thus, all elements of the cooling circuit of the air conditioner should be more durable and therefore more expensive.

Ozone-protected freons are not homogeneous, i.e. they consist of a mixture of several simple freons. For example, the R-407C has three components - R-32, R-134a and R-125. This means that even with a small flow of freon, the light components evaporate first, changing its composition and physical properties. After that, you need to drain all the poor quality freon and refill the air conditioner. In this regard, R-410A freon is preferable because it is conditionally isotropic, meaning that all of its components evaporate at approximately the same rate, and the air conditioner can simply be filled with little leakage. Freon is used as a refrigerant because of its physical properties - when it evaporates, it absorbs heat and then releases it during condensation. The principle of operation is as follows: in refrigeration equipment, freon is removed (absorbed) from the evaporator using a gas compressor, mechanically compressed to a reduced volume (in a reciprocating compressor in a cylinder - by piston), with simultaneous heating and delivery to the condenser. There, the freon cools to the ambient air temperature and liquefies. Liquid freon flows into the evaporator through a gas saving device (capillary tube or Thermostatic valve - TRV), the gas expands after the saving device due to low pressure and returns to the gaseous state again. The expansion process is accompanied by the absorption of a large amount of heat, as a result of which the walls of the evaporator cool down (the vessel in which the freon boils and evaporates), and the air temperature inside the cooled volume decreases.

The cycle is repeated until the temperature of the evaporator walls drops to the value set by the thermostat, after which the thermostat opens the electrical circuit of the compressor and it stops working. After a while, under the influence of various factors, the air in the cooling chamber heats up and the thermostat turns on the compressor again. Freon has been used as a refrigerant in all refrigeration equipment and air conditioners since 1931 (previously ammonia, which is harmful to health, was used). You can buy freon quickly and cheaply by contacting us. All common types of freons are available in large quantities in our warehouse. The coolant is also used to create aerosols in perfumery and medicine due to its thermodynamic properties. Freon is widely used in extinguishing fires in hazardous facilities.



II.CONCLUSION

The conclusion from the article is that the most popular Freon is the trade name given to the most widely used group in the industry a few years ago. Chlorine-containing fluorocarbons are called chlorofluorocarbons (CFCs). They were first used by the armed forces in World War II and reached the civilian market in 1947. Due to its unique combination of flammability and overall inertness, Freons are used in refrigerants, aerosol fuels, foam blowers, solvents, glass coolers, and polymer intermediates, as well as in fire extinguishers and anesthetics. Freons are irritants of the upper respiratory tract when exposed to the environment. They can also have cryogenic effects on tissues. Liquid Freons with low boiling point or under pressure can cause freezing of the skin if they touch the body for more than 3-5 seconds. It should be noted that Freon is exposed to chlorine, hydrogen fluoride, phosphine and chloride gases. separated, they are all very toxic.

REFERENCES

- 1.Turobjonov S.M., Tursunov T.T., Adilova K.M. The environment is hit chemistry. Study guide. T .: Cholpon, 2012.
2. www.econews.uz
3. www.ziyonet.uz
4. www.lex.uz



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