

THE OZONE LAYER AND LIFE

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<https://doi.org/10.5281/zenodo.6891676>

Abstract. *This article presents the cause of ozone layer depletion, scientists' views on restoring this depletion, a number of considerations on restoring the depletion, and a number of considerations on air purification. In the article, you can see the research of scientists, the research that I conducted in my article on the restoration of the depletion of the ozone layer, and a number of methods carried out through this research.*

Keywords: *Ozone layer, scientific research, stratosphere, Antarctic depletion, Montreal Protocol and recovery solution.*

ОЗОНОВЫЙ СЛОЙ И ЖИЗНЬ

Аннотация. *В данной статье представлены причина истощения озонового слоя, взгляды ученых на восстановление этого истощения, ряд соображений по восстановлению истощения и ряд соображений по очистке воздуха. В статье вы можете увидеть исследования ученых, исследование, которое я провел в своей статье по восстановлению истощения озонового слоя, и ряд методов, проведенных посредством этого исследования.*

Ключевые слова: *озоновый слой, научные исследования, стратосфера, истощение Антарктики, Монреальский протокол и решение по восстановлению.*

INTRODUCTION

Today, many people still do not understand the dangers of the ozone layer. 40 years ago, the depletion of the ozone layer and the hole in Antarctica left scientists confused. After this incident, scientists and various researchers tried to find many methods.

What is ozone? How is the ozone layer depleted and when did the period before its depletion begin?

Ozone or trioxygen is a highly reactive gas composed of three oxygen atoms. You can find ozone near the Earth's surface, but most of it is concentrated in the Earth's stratosphere. At ground level, ozone is a toxic molecule for humans and can damage the lungs when inhaled. Nevertheless, it is important and protective at 31 miles above the earth.[1]

Ozone actually protects humans from ultraviolet (UV) rays in the stratosphere. The amount of ozone is 3 million tons. It makes up three parts per million of air and absorbs 90% of the UV rays from the sun. If there is no ozone layer, people will suffer from skin diseases, cancer, radiation, decrease in immunity and increase the number of other diseases. It should be said that ozone is the gas that surrounds us and gives the blue color to the sky.

According to scientists, the depletion of the ozone layer began in 1970. The biggest reason for this phenomenon is that at that time, the smoke from the fast-flying aircraft and rockets combine with ozone gas to form O² and cause the loss of ozone gas.

In 1985, this threat became public knowledge. Scientist Joseph C. Farman and his colleagues found a 40 percent reduction in atmospheric ozone over Antarctica. Some man-made substances have reached the stratosphere and damaged the ozone layer to the point of depletion, creating a very thin area commonly called the ozone hole. The hole was formed at the South Pole due to the unique meteorological and chemical conditions of the region.[2]

By 2020, the Antarctic ozone hole has grown. It was the longest-lasting and one of the largest and deepest holes since ozone monitoring began 40 years ago. It was driven by a strong, stable and cold polar vortex and very cold temperatures in the stratosphere (the layer of the atmosphere between about 10 km and 50 km high). The same meteorological factors also contributed to the Arctic ozone hole reaching record levels in 2020. [3]

MATERIALS AND METHODS

What kind of research have scientists conducted to solve this problem today?

However, in 1974, American chemists Mario Molina and F. Sherwood Rowland of the University of California, Irvine, recognized that man-made chlorofluorocarbons (CFCs)—molecules containing only carbon, fluorine, and chlorine—were the source of the primary atoms. They also noted that chlorine can destroy large amounts of ozone after being freed from CFCs by exposure to UV radiation. Free chlorine atoms and chlorine-containing gases such as chlorine oxide (ClO) can break down ozone molecules by destroying one of the three oxygen atoms. Further studies have shown that bromine and certain bromine-containing compounds, such as bromine oxide (BrO), are more effective at destroying ozone than chlorine and its reactive compounds. Subsequent laboratory measurements, atmospheric measurements, and atmospheric modeling studies soon confirmed the importance of their findings. Crutzen, Molina and Rowland were awarded the Nobel Prize in Chemistry in 1995 for their efforts. [4]

Human activities had a significant impact on the global concentration and distribution of stratospheric ozone before the 1980s. In addition, the scientists noted that large annual decreases in average ozone concentrations began at least as early as 1980. Measurements by satellites, aircraft, ground-based sensors, and other instruments indicate that ozone is the total integrated column level (ie, number). [5] In the late 1980s, world governments agreed to protect the Earth's ozone layer by phasing out human-caused ozone-depleting substances under the Montreal Protocol. In Europe, the Protocol is implemented through EU-wide legislation that not only meets its objectives, but also includes stronger, more ambitious measures. Global action under the Montreal Protocol has halted ozone depletion and allowed recovery to begin, but much remains to be done to ensure a sustainable recovery. [6]

But it must be said that even though this project has contributed to 98% of the depletion of the ozone layer, they have found that fluorinated gases (F-gases) substituted for other gases have a warming effect and put these gases on their list of controlled gases. they agreed on the swelling.

The scientific consensus on the ozone hole led some countries to take unilateral action, and in 1987 a total of 46 countries aimed to phase out production of ozone-depleting substances. Signed the Montreal Protocol. However, the industry has not yet given up on this project; In 1988, DuPont President Richard Heckert wrote to the US Senate: "Current scientific evidence does not indicate that drastic reductions in CFC emissions are necessary. There are no measurements of the contribution of CFCs to any observed ozone changes. The Montreal Protocol, which has been in force since 1989, is often considered the most successful international environmental agreement in history. In fact, according to the United Nations, it is the only UN treaty to date that has been ratified by all countries on the planet, all 197 member states. [7] In 1985, governments adopted the Vienna Convention for the Protection of the Ozone Layer, which laid the foundation for the Montreal Protocol to phase out ozone-depleting substances, including chlorofluorocarbons (CFCs). The Protocol entered into force in 1989, and

by 2008 it was the first and only UN environmental agreement ratified by every country in the world. [8] Uzbekistan has been a member of the Montreal Protocol since 1993.

"The Montreal Protocol is one of the best examples we have of a positive and powerful outcome of multilateralism in the face of a triple planetary crisis - climate, nature and pollution," said Meg Seki, Executive Secretary of the United Nations Environment Programme. UNEP Ozone Secretariat. "If science is the basis for universal action, we can overcome insurmountable global environmental challenges." [9] "The last two seasons of the ozone hole demonstrate the year-to-year variability of the ozone hole and improve our understanding of the factors responsible for its formation, extent and intensity," said Oksana Tarasova, WMO Atmospheric Research department head. WMO Global Atmosphere Watch network of monitoring stations. "We need continued international efforts to implement the Montreal Protocol on ozone-depleting chemicals. "Ozone-depleting substances in the atmosphere are still enough to cause ozone depletion every year," says Dr. Tarasova. [10]

RESULTS

The ozone layer, like the protective umbrella of our planet, is a shield for all living things, it prevents the sun's ultraviolet rays from damaging the Earth's surface, and thus preserves life on the planet. Most of the ozone is in the stratosphere, 10-50 km above the earth's surface. On September 16, 1987, the Montreal Protocol on substances that deplete the ozone layer was signed at the UN General Assembly. This date, in 1994, was declared by the General Assembly as "International Day for the Protection of the Ozone Layer". Since 1995, this environmental holiday has been celebrated by the entire world community, and traditionally, this day is dedicated to raising awareness of specific actions aimed at protecting and preserving the ozone layer, both at the level of countries and at the level of each inhabitant of the Earth. Uzbekistan joined the Montreal Protocol in 1993 and ratified all four amendments to it, and our country is fulfilling all its obligations. As a result of the effective implementation of the requirements of the Montreal Protocol, 99.95% of ozone-depleting substances were removed from circulation in our republic. [11]

In addition, a number of laws on the protection of the ozone layer have been developed in Uzbekistan.

The following decisions of the Cabinet of Ministers of the Republic of Uzbekistan were adopted in order to ensure progress in the gradual abandonment of the consumption of ozone-depleting substances:

- On January 24, 2000, the national program on the cessation of the use of OEM was adopted No. :
- dated 14.03.2000 No. 90 "On regulation of import into the Republic of Uzbekistan and export from the Republic of Uzbekistan";
- 11.11.2005 No. 247 "On the regulation of import to and export from the Republic of Uzbekistan and improvement of export of products containing them". [12]

DISCUSSION

This was in contrast to the unusually small and short-lived Antarctic ozone hole of 2019. It can be said that after this extinction, the temperature of the Antarctic was observed to warm, many animals died and many environmental damages were also observed. Today, humans are the main cause of this destruction. Among these reasons we can include the following.

1. The reason for this is the increase in the number of livestock raised in agriculture. Uzbekistan ranks among the leaders in the world in the breeding of livestock, their types and breeds. Strong methane gas emitted from cattle dung is also harmful to the ozone layer. Therefore, livestock in foreign countries is decreasing.
2. During the period of industrial development, the construction of plants and factories is increasing. The smoke coming out of them quickly spreads into the air and harms not only the ozone layer, but also people.
3. Oil, gas, and especially coal emissions also contribute to decay.
4. We should mention that the increase in waste, the number of cars, and the various smokes and substances emitted from them, harm the ozone layer.

First of all, we can say that a number of activities carried out to restore the ozone layer made a significant contribution to the reduction of depletion.

However, it can be said that the “Covid 19” epidemic, which began at the end of 2019 and began in 2020, had an effect on the recovery of the ozone layer. In it, many industrial enterprises stopped working, the traffic on the roads was reduced, and the emission of various gases and fumes into the air was also reduced. In that year, the Shanghai sky, covered with a smoky vortex like a white cloud, also turned blue. I would like to mention 4 ways to clean the air and restore the ozone layer.

1. **Gradual transition from industrial development to eco-industrial system.** This means getting solar and wind energy instead of various industries and doing the same for cars.
2. **In the oil, gas, and coal industry, it is to improve them on the basis of eco-industry, reduce their use, and thereby help preserve the ozone layer.**
3. **Reduction of livestock.** By reducing livestock, a solution to this problem will be found. As we mentioned above, methane gas, which is the cause of the depletion of the ozone layer, is released from them.
4. **Establishing a method of planting more trees in the regions.** Therefore, the President developed the “Green Space” project and assigned the people to do it. Through this, we can achieve the cleanliness of the environment and the health of people. In short, the oxygen released from the trees through the “Green Space” project is not without benefits for us and the environment.

CONCLUSIONS

So, today, by neglecting the environment, people are neglecting their future and not only their health. Therefore, I would like to ask you not to be indifferent to the restoration of the ozone layer. It can also be said that during this research, all people are involved in the restoration of the ozone layer and its restoration. Because the ozone layer is the shell of life. The destruction of this shell may have negative consequences for us in the future. It can lead to a bad situation not only for us but also for future generations.

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