

## Ozone v/s Mankind: The Final Battle

**Inhabitants of the Earth!** It doesn't matter whether you're closing a deal, working on a construction site, or just waiting for time to fly by ... For God's sake, just stop what you're doing immediately and take a few moments to think about our choking planet – the Great Earth.

Imagine this scene: a patient fighting cancer, enduring every bit of pain, and clinging to any sign of hope. But in our case, the ozone layer is the patient, and the hole is the disease. Just as the danger on Man increases as the cancerous cells spread more and more, the ozone layer is threatened by the daily enlarging of its hole size, and is therefore protending life on earth. Impossible it is to just sit down and wait for a miraculous cure for our protective layer. Instead, we need to take severe measurements to inspire others to make a change. Earth is not a hopeless case; our unity can save it! But before all this, how did all this mess start?

Have you heard of Ozone? It is a simple molecule consisting of three Oxygen atoms bound together. It is not only a natural occurring gas but a component of smog created by the burning of fossil fuels. Ozone is one of the critical trace gases referred to as the greenhouse gases. Actually, this simple compound plays two important roles: in the lower atmosphere, it helps keep the Earth warm and in the upper atmosphere, it blocks 95 to 99% of the sun's harmful UV rays that strike our planet. The atmosphere alone cannot stand as an obstacle in the face of UV rays, so here is where ozone interferes.

More than two decades ago, scientists jeered at the thought of the destruction of ozone due to the thought of ozone destruction by industrial chemicals. But now, it is known for a fact that chlorine is the major source that pinches the ozone, by eating up its molecules. After years of study on the ground and in satellites, the main source of chlorine was identified- human made chemicals called Chlorofluorocarbons or CFCs, mainly used in aerosol cans, foam packaging and refrigeration materials.

CFCs were invented about 6 decades ago as non-toxic substances used mainly in refrigerators. Over the years, these compounds have paved their path to commercial use and became a part of aerosol sprays and plastic manufacturing, until industries started using about million tons of CFCs yearly. Certainly, lack of equipment then kept scientists from discovering the destructive impacts CFCs had on the ozone.

But in 1970, British scientist James Lovelock's unexpected detection of CFCs in air led to further studies. Lovelock's discoveries interested atmospheric scientists F. Sherwood Rowland who joined Mario Molina, a colleague at the University of California, Irvine to solve this mysterious riddle. Both scientists showed that CFCs were invulnerable to visible sunlight, nearly insoluble in water, and resistant to oxidation in the atmosphere's lower depths. Yet at altitudes above 18 miles, CFCs showed their vulnerability and ability to break down a huge number of ozone molecules. Further studies held by the two scientists proved their discovery. They expected long-term hazards to hit the Earth if no action was taken. So, they alerted countries by asking for the banning of CFC use. The United States, Canada, Norway and Sweden responded to their call in the late 1970s.

In 1978 and 1979, scientists detected less ozone in the southern atmosphere than before, and this decreased level of ozone continued its decline until it reached 35% less in 1984 than in the 1960s. After these results were confirmed, the term "Antarctic ozone hole" spread worldwide.

The scientists' discoveries started to climb the mountain of evidence, when studies showed that atomic chlorine and chlorine oxide radicals were responsible for the loss of ozone over Antarctica, and when CFC levels increased tremendously in the lower atmosphere. So, the evidence was in their hands: CFCs and two other pollutants- the industrial solvents carbon tetrachloride and methylchloroform- were devouring ozone molecules, creating the gap in the layer.

After the catastrophe became a political, philosophical and scientific concern, more than 150 countries signed the Montreal protocol to reduce the release of CFCs in the atmosphere. In spite of this fact, ozone depletion will still be a natural disaster that we need to cope with. In the middle of the next century, Ozone is expected to go back to its levels in the 1970s.

Can you imagine what would have happened if these scientists weren't interested in discovering something new? How would the world look like if we faced ozone depletion everywhere? How can we honor these scientists?

It was the Royal Swedish Academy of Sciences that awarded them the Noble Prize in chemistry in 1995 ... and they really deserve it.

CFCs released ... hole discovered ... depletion detected ... drastic measures taken; the fact that we know about the ozone's illness comes at our favor. What about its bad effects?

Before defining this depletion, increased UV rays on biological systems had been investigated but alternations in tropospheric chemistry and potential global warming could not be detected before. This is not only it.

Ozone depletion spreads its harm to all living things. Aquatic ecosystems have joined the injured circles of life due to ozone depletion. A decreased mobility and orientation, changes in photosynthetic and enzymatic reactions, reduction in primary productivity, susceptibility to disease and a reduced uptake of CO<sub>2</sub> by oceans were detected on marine animals and plants. Humans eat these animals and are indirectly affected. In the past years, the earth has been more feverish than before, and of course, who else to blame other than Ozone.

Skin cancer, eye damage, DNA damage and harm in the immune system will lead to the death of humans. But we gave birth to this disaster!

And now, without further delay, I would like to present to you mankind- the major source of destruction and damage to the ozone layer. Man created CFCs out of selfishness and greed. Yes, it's my fault just as it's his fault. We're supposed to be an exact figure of God- a symbol of peace and unity, a spring of love and sacrifice ... But now, blaming each other will take us a step farther away from the solution. What is done is done ... We can't withdraw our destructive actions... Sorry is just a word... No one can deny that these words are the treasure of Man's wisdom. But did anyone say something about the future? You build your future with your own hands. Your strength for defeating hardships and your refusal to give up will drive you to success. So, why don't we all act to save the earth? Why don't we all work on rebuilding what was destroyed?

A cry of mankind, a hope for change, a deep love for our treasured lives ... that's what it's all about! God has placed us on Earth to leave a footprint and accomplish a mission. No one wants to die unremembered. Have you ever wondered what the purpose of your life is? Here's a lucky guess. Maybe, your reason for living is standing in the face of ozone depletion ... I'm just saying!

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