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Commentary

Impact of Ultraviolet Radiation and Stratospheric Ozone Degradation

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DESCRIPTION

The word 'Ozone' comes from the Greek word which means 'Smell'. The term is derived from ground-level ozone, which emits a pungent, acrid odor. This definition reflects the ozone problem in the lower atmosphere. Ozone, on the other hand, can be found in the stratosphere. The stratosphere is a region of the atmosphere that exists between ten and fifty kilometers above the Earth's surface, above the planetary boundary layer. This layer absorbs the middle portion of the Ultra Violet (UV) spectrum. Ozone absorbs all UV radiation with wavelengths shorter than 290 nanometers (UV-C), the majority of UV radiation with wavelengths between 290 and 320 nanometers (UV-B), and above 320 nanometers (UV-A) (UV-A) the majority of it between 290 and 320 nanometers (UV-B), and very above 320 nanometers (UV-A). While UV-A is relatively safe, UV-C is UV-B damages the skin. Because oxygen and other gases absorb wavelengths only below 200 nanometers, ozone is our only line of defence against the middle ultraviolet the maximum ozone concentration is only a few parts per million and occurs between twenty and thirty kilometers above the Earth. Because the air at that altitude is only about 5% as dense as it is at ground level, the sparse ozone concentrations are better described as a veil rather than a layer. Ozone levels are measured using Dobson units (DUs). The DU is a straightforward method of expressing the total thickness of the ozone layer at sea level. At standard temperatures and pressures, one DU equals one thousandth of a centimetre. At the temperature and pressure found in the Earth's atmosphere, one millimetre of ozone is equivalent to one hundred DUs. Three hundred DUs (the global average) corresponds to the abundance of molecular particles that would form a 3 mm thick layer at sea level, with the weight of the atmosphere compressing it. Over Antarctica, the normal amount of ozone is around 400 DUs in summer and 300 DUs in late winter/early spring. Ordinary oxygen molecules absorb short-wavelength ultraviolet light. Oxygen molecules account for 21% of all atmospheric molecules by volume, while nitrogen accounts for 78%, and the sunlight splits oxygen molecules into two oxygen atoms these oxygen atoms would then attach themselves. By colliding with oxygen molecules, oxygen atoms can split into two oxygen molecules. As a result, at any given time, the rate of ozone production equals the rate of ozone destruction. Given constant conditions, ozone settles into a dynamic steady state in which the rate of formation equals the rate of removal. 'The ozone layer's natural balance is thrown into disarray by the damage caused by Ozone Depleting Substances (ODS). The chemical phenomenon the ODS theory has a small amounts of chlorine or bromine to destroy ozone in large quantities. By hastening ozone decomposition, chlorine disrupts that balance and reduces the amount of ozone in the stratosphere. It decomposes into two oxygen molecules. More importantly, because chlorine (like nitrogen and hydrogen oxides) remains unchanged during the process, it acts as a catalytic agent. It breakdown down into two oxygen molecules. More importantly, because it is unchanged in the process, chlorine (like nitrogen and hydrogen oxides) acts as a catalytic agent. As a result, each chlorine atom can destroy thousands of ozone molecules before being returned to the troposphere, where it is removed from the atmosphere by precipitation and other processes. As ozone DUs decrease, UV light has more access. More than five times the amount of UV-B light (from before the ozone layer was depleted) was penetrating the Earth in certain places at certain times by the latter.' It is a 4% increase in Northern Hemisphere mid-latitudes in summer/autumn and a 7% increase in winter/spring compared to (sub-burning) UV radiation hitting the Earth in the mid-century it's 22% higher in the Arctic. There is a 6% increase in the Southern Hemisphere over the entire year and up to 12% in some regions, 30% has increased. Different ozone measurement figures can be obtained depending on whether they are taken as a whole for the planet or are regionally specific.

CONCLUSION

The world average record in different regions change according to seasonal and geographical variations are most pronounced among poles.These regions are comparable to the longer-term declines found in the Northern and Southern mid-latitudes, but even the more stable tropical belt witnessed drops of up to 13% below normal.

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Over the duration of the earlier time's in winter and spring 8% of decrease in ozone over the entire nation compared to earlier ozone abundance levels and 2% to 4% of the ozone above the Northern Mid-Latitudes are disappearing in winter and the ozone layers in the Antarctic and Arctic are the most severely depleted. The world average record in different regions change according to seasonal and geographical variations are most pronounced among Poles.