

# The Benefits of Ozone and Negative Ions

## Ozone

Ozone is created by nature to clean our environment. In the upper atmosphere, ozone protects the earth from harmful ultraviolet radiation. In the lower atmosphere where we live, ozone is very effective in purifying and sanitizing the air we breathe while removing odors. In 2001, the FDA approved the use of ozone as an anti-microbial cleansing agent for food treatment, storage and processing.

Ozone (O<sub>3</sub>) consists of three oxygen atoms. In nature it is created when ultraviolet (UV) light from the sun breaks down the oxygen molecule into two single oxygen atoms which quickly attaches itself to another oxygen molecule (O<sub>2</sub>) to become ozone. Ozone is also created electrically in nature during active thunderstorms. The electrical discharge, just like UV light creates ozone which gives that sweet smell we understand as clean fresh air.

The life cycle of ozone consists of creation, oxidation and reversion to oxygen. The half life of ozone is about 30 minutes. As a very unstable gas the third oxygen atom wants to break away soon after formation. It actively seeks out and destroys polluting organic molecules of a chemical or biological nature by oxidizing them. The oxidation process involves releasing the 3rd Oxygen atom on the offending pollutant and it then reverts to Oxygen (O<sub>2</sub>). The 3rd Oxygen atom that is released will attach, oxidize and eliminate pollutants, including bacteria, viruses, fungi and molds. This process effectively deodorizes, disinfects, and destroys pollutants.

Many people have been misinformed that Ozone is smog and that it is toxic, capable of doing great harm to our health. In fact, the real truth is exactly the opposite – nature uses ozone to clean the environment and without Ozone our air will be so polluted as to be toxic. This misinformation arises from the unfortunate fact that ozone is often used as a ground level air quality indicator as it is easy to detect and measure. Large cities produce huge amounts of nitric oxides and sulfur compounds from the burning of hydrocarbons by vehicles, factories and power plants. As the generation of these dangerous pollutants is much faster than nature can remove them, they remain in the lower atmosphere. At the same time, ultraviolet light from the sun reacts with the unburned hydrocarbons producing ozone as a by-product. As ozone is heavier than air, it tends to get trapped in the concoction of pollutants which it is also trying to eliminate. However, as large cities generate large quantities of vehicular and industrial pollution, nature is overwhelmed and smog is the outcome. As ozone is more easily detected, it is used as an indicator for the level of pollution but in itself is not a pollutant.

Ozone is safe to use and has many applications such as air purification, water purification, deodorization and food sanitation. Depending on the applications, Ozone should be controlled at a level appropriate for use in the specific application.

## Negative Ions

Similar to Ozone, negative ions (O<sup>-</sup>) are nature's cleaning agent. Both Ozone and negative ions are powerful cleaning agents that complement each other. Negative ions are single oxygen atoms that have gain extra electrons. In basic terms, negative ion is a charged particle in the air that is formed in nature when enough energy acts upon a molecule that ejects an electron from itself and quickly attach to a nearby molecule which then becomes a negatively charged ion.

Negative ions are naturally found in abundance in places like mountains, forests, beaches, waterfalls and even after raining. In nature, they are created from plant photosynthesis and through the movement of water. These negative ions help to clean the air by causing allergens such as pollen, dust, mold spores, bacteria and other harmful particles floating in the air to be attracted and stick together forming clusters. These clusters of particles then become heavy enough to drop to the ground where they can be vacuumed

rather than staying in suspension where they can be breathed in. Many studies have shown that negative ions bring beneficial effects on human health such as for allergies, sinusitis, insomnia, hayfever, asthma and other respiratory conditions.

## **Ozone and Negative Ions – Performing Different Beneficial Roles**

Both Ozone and negative ions are nature's way of cleaning the environment and although they have different functions they complement each other very well. Negatively charged ions are effective in removing pollen, dust, mold spores and other harmful particles from the air and are able to improve mood. However, Ozone is much more effective in removing pollutants and odors, and is a powerful oxidant that kills lower organism like bacteria, mold and viruses. Negative ions are effective in cleaning the air while ozone purifies the whole environment, that is, it cleans more than just the air. The scientific reason is that the half-life of negative ions is only few seconds while Ozone has a half-life of about 30 minutes. Therefore, Ozone is able to sustain in the environment longer which makes it more effective in performing its purification process.

Negative ion has not been found harmful even in very high concentrations while ozone can be an irritant but not toxic when it is at very high concentrations. Ozone is completely safe to use, especially when recommended level as per the OSHA or EPA standards are followed.

**Source:** <http://medklinn.com/global/index.php?page=resources-ozone-negativeions>