



Introduction - Hydroxyl Radical

The development of human societies around the world has generated a very serious environmental threat to human health and even the survival of animals and plants, due to a higher incidence of infectious diseases. **The increased airborne spread of pathogenic microorganisms has raised serious concerns about its threat to environmental security and human life.**

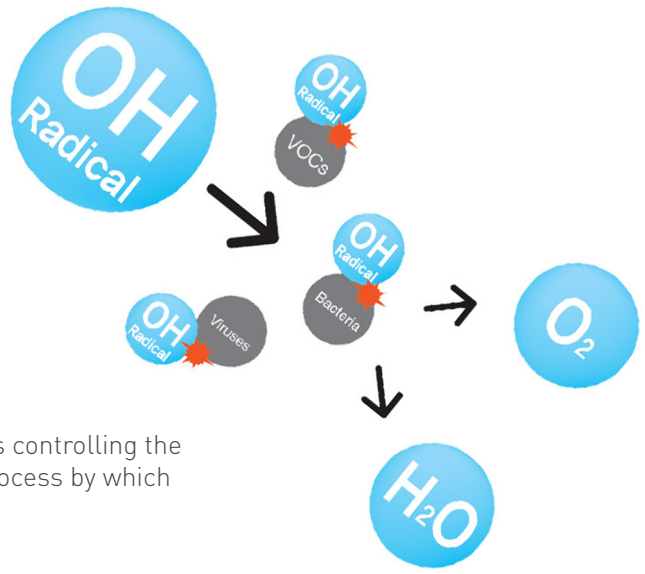
The hydroxyl 'OH radical is one of the main chemical species controlling the oxidizing capacity of the global Earth atmosphere. This is the process by which Mother Nature cleans the air.

Hydroxyl Radical Significance

The hydroxyl radical can damage virtually all types of macromolecules. It has a very short in vivo half-life, approximately 10^{-9} seconds and a high reactivity. This makes it a very dangerous compound to organisms. Favorably however, humans, animals and plants have evolved to coexist with hydroxyl radicals, and hydroxyl radicals cannot enter the blood stream or tissues within our body.

Effects on Microorganisms

Hydroxyl radicals attack essential cell components and are therefore lethal to pathogenic viruses and bacteria – both in the air and on surfaces. Pathogenic viruses suffer fatally from oxidation of their surface structures. Hydroxyl radicals break the lipid membrane envelope around the virus. They also penetrate the virus's interior and disrupt its genome. These actions inactivate the virus. Hydroxyl radicals also pass through the outer cell wall structures of bacteria and oxidize the membrane responsible for electron transport, making the organism non-viable.



This oxidation process has similar effective implications on Allergens, Organic pollutants and other Microorganisms.

The atmospheric chemistry leading to **hydroxyl radical creation** is generally absent indoors, in our living spaces.

However, new technologies, pioneered by **NASA** have now made it possible to reproduce the outdoor effects of hydroxyl radicals indoors, enabling the continuous deactivation of viruses & bacteria, removal of toxic gases & odors, and neutralization of allergens throughout an inside space.

The main challenge in rapidly eliminating pathogenic microorganisms in shared air spaces is, how to produce the OH radicals in large quantities and high concentration.

Wellisair Disinfection Purifier WADU-02 has the most advanced technology in the global market to produce and spread an abundance of **OH Radicals** in an indoor space. Its functionality and effectiveness to kill and inactivate microorganisms have been tested and proven.