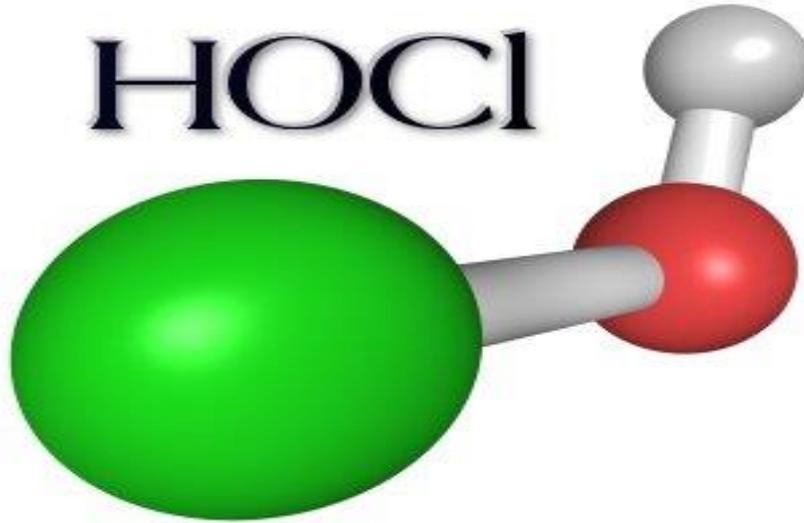


# Hypochlorous Acid



Hypochlorous acid is naturally produced by white blood cells of all mammals. It plays an important role in the immune system killing pathogens through oxidation and chlorination.

Hypochlorous acid can also be produced through a process called electrolysis. Electrolysis is a technique that uses a direct electric current (DC) to drive an otherwise non-spontaneous chemical reaction. Specifically engineered electrolysis cells can generate a solution of free chlorine species by running electricity through NaCl (table salt) and water. The oxidants hypochlorous acid (HOCl) and hypochlorite (OCl<sup>-</sup>) are formed at the anode. If the pH of the solution is weakly acidic to neutral, the free chlorine solution will be dominated by hypochlorous acid.

*Hypochlorous is a powerful oxidant and is 100 times more efficient at killing microbial pathogens than sodium hypochlorite (aka. chlorine bleach).*

## Safe on Eyes and Skin

Hypochlorous acid does not cause irritation to eyes and skin. Even if it were ingested it causes no harm. Because it is so safe, it is the ideal sanitizer for direct food sanitation and food contact surfaces. It is also ideal in healthcare where it is used for wound cleansing, eye drops, and patient room disinfection replacing toxic chemicals such as bleach and quaternary ammonium (quats).

# Hypochlorous Acid



## Non-Toxic, Non-Hazardous

Sanitation chemicals distributed in concentrated form are toxic and can be hazardous. Contact with skin or inhalation of fumes can cause irritation. These risks do not exist with hypochlorous acid. Electrolyzed water systems generate hypochlorous acid from just table salt, water and electricity. No personal protective gear is required.



# Hypochlorous Acid

## How does HOCl kill microbial pathogens?

The molecule of hypochlorous acid is HOCl. This molecule is unique in that it is neutrally charged unlike hypochlorite (OCl<sup>-</sup>) which is negatively charged. So why is this important?

Disinfectants and microbial pathogens interact with each other similar to magnets. If you bring together two negatively charged magnets, they will repel each other. Bacteria and hypochlorite (OCl<sup>-</sup> aka. bleach) are both negatively charged and behave like two negatively charged magnets repelling each other. Hypochlorous acid (HOCl) is neutrally charged and is not repelled by bacteria. HOCl easily penetrates the walls of the bacteria and destroys them with its strong oxidation potential.

Why is pH important?

A free available chlorine (FAC) molecule is one that is not attached. There are three forms of free available chlorine: chlorine gas, hypochlorous acid and hypochlorite. Assuming a constant temperature of 25 degrees Celsius, when the pH is below 3, free chlorine will leave solution as chlorine gas. When the pH is above 7.5, over 50% will be hypochlorite (OCl<sup>-</sup>) and will increase in hypochlorite as it rises toward pH 14. Between pH 3 and pH 7.5 the free chlorine solution will be dominated by hypochlorous acid (HOCl).

