

HOCL as a biocide

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The HOCL as biocide is an inorganic compound with the chemical formula HClO. It corresponds to the least oxidized of the oxoacids of chlorine, since it contains only one oxygen atom. From it they derive the hypochlorite anion, ClO^- , and its salts, widely used as commercial water disinfectants.

HClO is the strongest oxidizing and antimicrobial agent generated when chlorine gas dissolves in water. Its antiseptic action has been known for more than a century, even before chlorine solutions were used to clean the wounds of soldiers in the First World War.

Its discovery actually dates back to the year 1834, by the French chemist Antoine Jérôme Balard, who achieved partial oxidation of chlorine by bubbling it in an aqueous suspension of mercury oxide, HgO. Since then, it has been used as a disinfectant and an antiviral agent.

Chemically speaking, HClO is an oxidizing agent that ends up giving up its chlorine atom to other molecules; that is to say, with it chlorinated compounds can be synthesized, being chloroamines of great relevance in the development of new antibiotics.

In the 1970s, it was discovered that the body is capable of naturally producing this acid through the action of the enzyme myeloperoxidase; enzyme that acts on peroxides and chloride anions during phagocytosis. Thus, from the same organism this "killer" of intruders can emerge, but on a harmless scale for its own well-being.

General features

HClO can be used as an oxidizing agent to oxidize alcohols to ketones, and to synthesize chloroamines, chloroamides, or chlorohydrins (starting from the alkenes).

However, all its other uses can be encompassed in one word: biocide. It is a killer of fungi, bacteria, viruses, and a neutralizer of toxins released by pathogens.

The immune system of our body synthesizes its own HClO by the action of the enzyme myeloperoxidase, helping the white blood cells to eradicate the intruders that cause the infection.

Disinfection and cleaning

HOCL as a biocide ends up being used to:

- Treatment of infectious and gangrene wounds
- Disinfect water supplies
- Sterilizing agent for surgical material, or tools used in veterinary medicine, medicine and dentistry
- Disinfectant of any type of surface or object in general: bars, handrails, coffee machines, ceramics, glass tables, laboratory counters, etc.
- Synthesizing chloramines that serve as less aggressive antibiotics, but at the same time more durable, specific and stable than HClO itself.

References

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