

The COSHH Implications of Hypochlorous Acid (HOCl) Generated by Electrolysis of Saline Solution or the Dissolution of NaDCC*

“The surgeon needs to have an inexpensive, available, nontoxic, and practical disinfectant that is effective in sanitizing against the COVID-19 (Coronavirus Disease 2019) virus. ...The results indicate that this material can be used with a high predictability for disinfecting against the COVID-19 (Coronavirus Disease 2019) virus.” ¹⁸

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Hypochlorous acid is a halogen oxoacid with the formula HOCl.¹

HOCl may also be described as a Reactive Oxygen Species ². It is produced in small quantities naturally in the human body and all mammalian species, by an enzyme, myeloperoxidase, which is part of the host defence system of polymorphonuclear leukocytes, more commonly known as white blood cells. It has powerful antimicrobial activity against a wide range of organisms including bacteria, fungi, and viruses.

A solution of HOCl can be made by the electrolysis of a weak salt solution via an electrochemical cell. These Electrochemically Activated Solutions (ECAS) have been shown to exhibit broad-spectrum antimicrobial activity which have the potential to be widely adopted within the healthcare environment. ⁴ Numerous studies have found ECAS to be highly efficacious, as both a novel environmental decontaminant and a topical agent. ⁵

Equally, when sodium dichloroisocyanurate (or NaDCC) chlorine-releasing tablet is dissolved in water, a solution of hypochlorous acid is formed (the active compound) together with sodium cyanurate. ⁶ Hypochlorous acid produced through the dissolution of NaDCC tablets is chemically identical and toxicologically equivalent to HOCl made through electrolysis of saline solution. ¹³

HOCl has two distinct advantages over other commonly used decontaminants. Firstly, it is known to be an order of magnitude (i.e. approx. 10x) more effective than bleach in terms of its efficacy and speed (of kill/inactivation) against microorganisms ^{7, 13}. Secondly, it safe to use. HOCl is bio-compatible ¹², has no environmental legacy⁸ and is compatible with a wide range of materials. It is a naturally-occurring biochemical ⁹, harmless if ingested**^{10, 16}, contains no alcohol and is gentle on the skin ¹¹, at the same time as being scientifically proven against bacteria, viruses and fungi ¹².

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HOCl is currently used in a number of diverse applications¹⁴ from the treatment of drinking water and preservation of food to the treatment of abdominal cavity wounds, eye infections and nasal rinses. It is understood that the efficacy of gargling and rinsing of nasal passages with saline solution is indeed effective due to the generation within cells of HOCl on contact with sodium chloride (salt)^{15, 17}.

These properties are not seen in any other disinfectant or decontaminant.

Hypochlorous Acid has no COSHH implications and should be widely accepted as a safe, superiorly effective, and highly desirable method of disinfection.

References:

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*Sodium Dichloroisocyanurate/Trosclose Sodium

**If ingested on dissolution, i.e. as opposed to NaDCC tablet form.

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