

How are solutions with sodium hypochlorite manufactured?

ECA-based products are always manufactured by means of electrochemical activation (ECA), a process of electrolysis. During electrochemical activation, a voltage is applied to an extremely pure aqueous mineral salt solution to produce two different solutions, an anolyte and a catholyte, separated by a membrane. The anolyte in particular has antimicrobial potential. (4)

How does it act?

Products manufactured by means of electrochemical activation (ECA) contain the preservative sodium hypochlorite. Sodium hypochlorite is the sodium salt of hypochlorous acid and at the same time a strong oxidising agent that splits off and releases oxygen (O). The free oxygen acts on the cell walls of micro-organisms, including pathogenic bacteria.

The damaged cell wall can no longer maintain its protective function, e.g. can no longer withstand the osmotic pressure, and is destroyed. Once the oxygen molecule has split off from the sodium hypochlorite, the substance reverts to its natural state of sodium chloride (NaCl).

Products manufactured by means of ECA have a high positive redox potential. This redox potential can create a voltage in membrane-bound electron transport chains in micro-organisms and thus destroy membrane function. Human cells tolerate considerably higher voltages and are therefore not damaged. (1,3,4,6)

How long does it have to be left on and what organisms does it affect?

Products manufactured by means of electrochemical activation (ECA) are effective against a very broad spectrum of Gram-positive and Gram-negative bacteria (including *Pseudomonas*, MRSA/MRE), viruses and fungi, which also allows the non-specific decontamination of wounds. Their effectiveness depends particularly upon the extent of organic contamination. In vitro testing has shown that sodium

hypochlorite solutions can reduce the count of various clinical bacterial isolates (without any organic contamination) by more than 4 log steps within a period of 60 seconds to 5 minutes. (1,3,4)

How well is it tolerated on the wound?

Products containing sodium hypochlorite at the concentrations of 0.06% or 0.08% recommended for wound care show only a very low cytotoxic potential. They are very well tolerated on human skin and the likelihood of mucosal irritation is minimal. For this reason, they can be used on sensitive areas, such as acute or chronic wounds of the skin or mucosa. (1,4)

Can it be used in joints and on cartilage?

Pertinent literature that supports the use of sodium hypochlorite on tendons, ligaments, cartilage and bones already exists. At the present time, there are no known adverse effects from such use of products manufactured by means of ECA. (3,6)

Is it possible to use it on mucous membranes and in cavities?

Products manufactured by means of electrochemical activation (ECA) are suitable for use on skin and mucous membranes. Besides products for wound care, there are products available on the market for MRSA decontamination; these products are also intended for use in the nose, mouth, and ears.

Is it compatible with polihexanide and other products for wound care?

In principle, ECA products should not be used immediately before or after other sprays, solutions, gels or pre-soaked compresses intended to clean wounds. It is, however, possible to give alternating treatment, e.g. rinsing with PHMB solution in the morning and with sodium hypochlorite in the evening. However, a combination with dressings or compresses that are pre-soaked with solutions containing chlor-

hexidine or silver is basically not possible. Chemical reactions with other substances, e.g. an oxidation process with silver, cannot be ruled out.

Can it be used with biofilms?

When cleaning wounds, products manufactured by means of electrochemical activation (ECA), especially solutions and sprays, can also be used to remove biofilms and fibrinoid deposits. (1,2,6)

Can it be used in the case of Pseudomonas and MRSA?

Products manufactured by means of electrochemical activation (ECA) can also be used without restriction for the above-mentioned organisms. As part of reducing the bioburden, sodium hypochlorite has a major effect in decreasing associated odours. (1,5)

Literatur:

- [1] Brill FHH. Data on file. 2013
- [2] Kammerlander G, Assadian O, Eberlein T, Zweitmuller P, Luchsinger S, Andriessen A. A clinical evaluation of the efficacy and safety of singlet oxygen in cleansing and disinfecting stagnating wounds. *J Wound Care*. 2011 Apr; 20(4): 149-50
- [3] Kramer A. Wundantiseptik. *ARS MEDICI*. 2016 (9): 419-426
- [4] Lorberth J, Massa W. Zu den chemischen Grundlagen der Wirkung von Steralythen. *Wund Management* 2012 (3): 52-54
- [5] Möller A, Splieth B, Schmitz M, Eberlein T. Produkte auf Basis elektrochemischer Aktivierung (ECA) im erweiterten medizinischen Einsatz. *Medizin & Praxis*. 2016
- [6] Christian Willy, Catharina Scheuermann-Poley, Marcus Stichling, Thomas von Stein, Axel Kramer
Bedeutung von Wundspüllösungen und Flüssigkeiten mit antiseptischer Wirkung in Therapie und Prophylaxe



**SERAG
WIESSNER**

SERAG-WIESSNER GmbH & Co. KG
Zum Kugelfang 8 - 12
95119 Naila/Germany

 + 49 9282 937-0

 + 49 9282 937-9369

Export Department:

 + 49 9282 937-230

 + 49 9282 937-9785

 info@serag-wiessner.de

 www.serag-wiessner.de