



**Science & Technology
driven Innovation in
Hygiene & Disinfection**

by



Solutions for the fight against emerging pathogens

April 2020

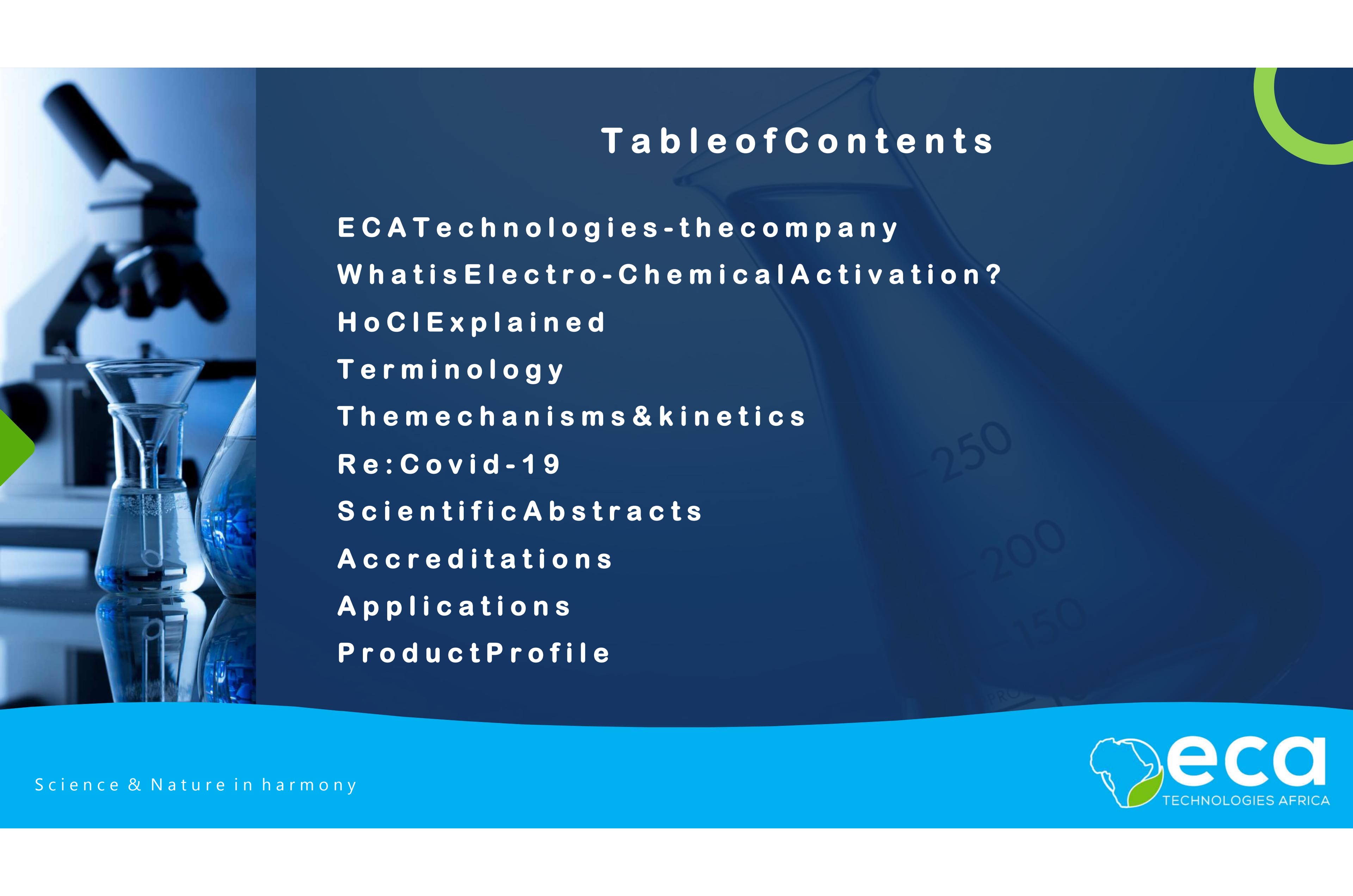


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ECA Technologies Africa was established in South Africa over 10 years ago. For these 10 yrs we have been producing Eco-Lyte and implementing its on-site generating technology to a host of industries and use cases from food production & processing through to water treatment and healthcare. The Eco-Lyte products are trademarked and registered with the SABS and South Africa's disinfectant Act5.

With over R10 million spent in research & development and ever increasing applications and demand, we have seen the adoption of the product & technology from initial scepticism through to scientific & commercial success with an ever evolving development platform of new applications & ground breaking research.

The team behind the product has always been passionate about getting power of Eco-lyte HoCl through to as many users as possible, be it in ready to use bottle form or via the specialised on-site generating systems for large users. Eco-lyte is manufactured under strict guidance & control by ECA Technologies and select 3rd party manufacturing & distribution licensees.

Our Vision

A world of water treatment, food production, processing & hygiene that is free from harsh chemicals.

Creating awareness around the technology & natural bio-chemistry that solves so many modern challenges such as "superbugs", viruses, carcinogenic processing additives & the overuse of antibiotics.

Our Mission

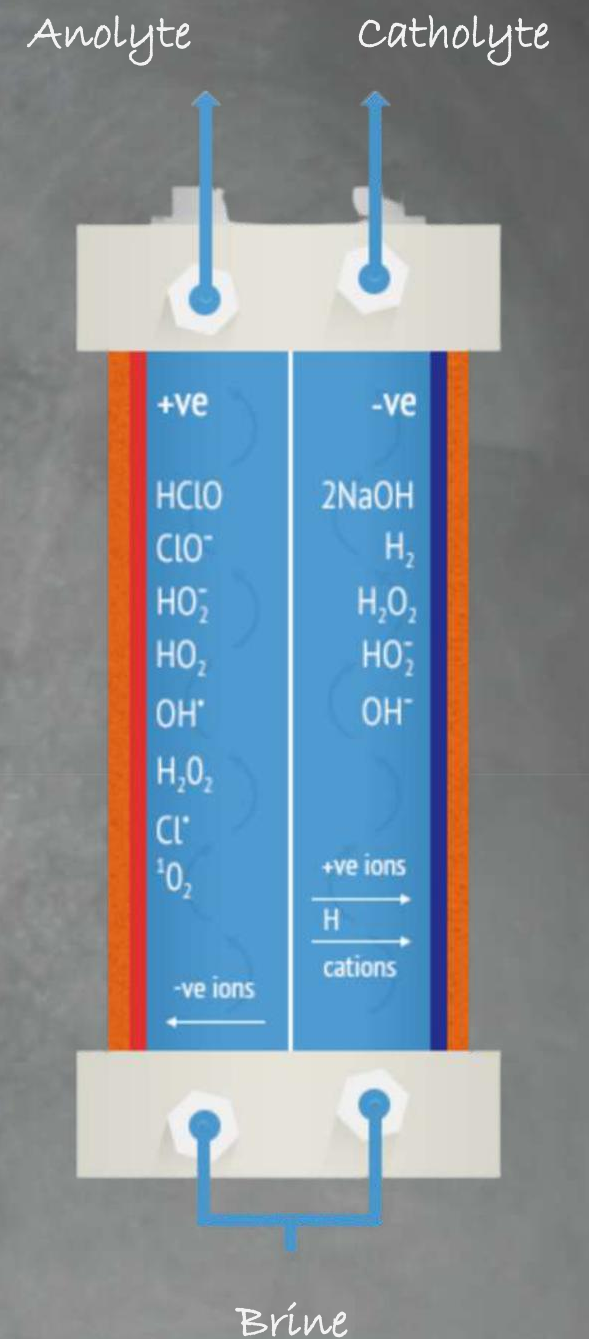
To make a sizeable reduction in the consumption of chemicals that bring harm to food, water and people by introducing Electro-Chemical activation technology as an earth friendly alternative. We strive to bring about industrial, institutional and individual awareness & results with truly sustainable chemistry & technology

What is E.C.A?

Electro-Chemical Activation is the process of applying a specified electrical current through anodes & cathodes of a specialised reactor. Molten salts are ionically separated via membrane and activated into...

Anolyte: A potent Biocide mixed oxidant formula featuring HOCl

Catholyte: A reducing agent with detergent properties

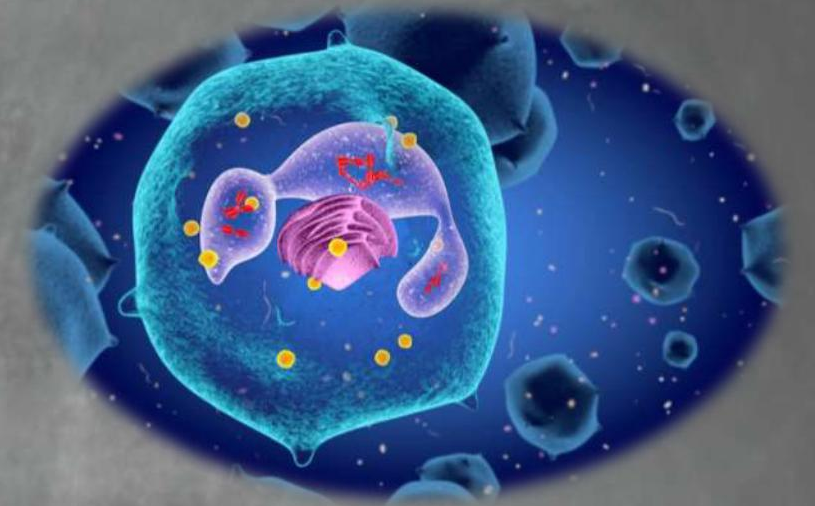


What is HOCl?

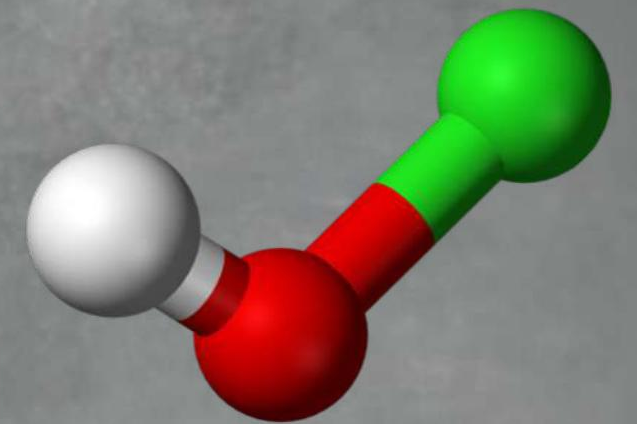
Hypochlorous Acid (HOCl) is a naturally occurring bio-chemical that is produced by our neutrophils, or white blood cells, to fight bacteria & inflammation after an infection or trauma.

HOCl provides a unique power to eradicate dangerous organisms without causing harm to our cells.

The power of HOCl have been known for over 100yrs but has been limited in application until the field of ECA advanced, allowing for toxin free, stabilized production.



Mammalian Neutrophile



HOCl Molecule





Terminology

With hundreds upon hundreds of scientific papers, journals & studies conducted on the field of Electro-chemistry; the terminologies abound, depending on the institution and geographic region. The following are some of the terms used for ECA produced chemistry:

Anolyte & Catholyte

Electrolyzed Water

Mixed Oxidant Solution(MOS)

Neutral Electrolyzed Water (NEW)

Acidic Electrolyzed Water (AEW)

Super Oxidised Water(SOW)

HOCl Water

Functional oxidizing (or reduced) Water

ECA water

The chemistry is not to be confused with the traditional ChlorAlkali process and the production of Bleach (Sodium Hypochlorite) , Caustic Soda & Chlorine Gas. Unlike these forms of Electrolysis our products are produced at a high purity level, metastable and ready to use, void of toxicity and unnecessary ions. Various reports highlight efficacies of x80 to x400 times the disinfection potency of bleach

PPM: Partspermillion

PH: Power of Hydrogen

ORP: Oxidation Reduction Potential

The Mechanisms & Kinetics of Eco-Lyte

Eco-Lyte NTL is a powerful oxidant. We measure oxidants or reducers using the Redox (ORP) scale presented in 'mv'. Eco-Lyte NTL provides the uniquely high measurement of 800mv+ to over 1100mv+ (PH dependant), which is significantly higher than other oxidising products such as bleach. The oxidation kills microbial pathogens immediately upon contact, by damaging the cells walls or inactivating the pathogen by entering & disrupting proteins, lipids & DNA. HOCl is neutral in charge and therefore disinfection kinetics take place, regardless of microorganism charge (+ or -). All of this destruction potential is limited to the "undesirables", whilst still being safe to human cells thanks to the chemistry being endogenous to our own biology. Once Eco-Lyte has performed the task at hand it readily biodegrades, leaving no harsh chemistry or negative effective to the user & environment. Unlike many other disinfectants, viruses & bacteria cannot build a tolerance or mutate therefore mitigating the risk of future resistance & creation of 'super-bugs'

"Microorganisms will be exposed to powerful oxidants which will sequester electrons with high efficiency from microbial structural compounds, causing the rupturing of biochemical bonds and subsequent loss of function. Moreover, the high ORP environment is thought to create an unbalanced osmolarity between the ion concentrations in the solution and that within unicellular organisms, further damaging membrane structures. This will cause increased membrane porosity, enabling oxidising moieties (present in excess in ECAS) to penetrate (via diffusion) into the cell cytoplasm, ultimately leading to the inactivation of intracellular protein, lipids and nucleic acid, rendering the cell non-functional"

Chittoria RK, Yootla M, Sampatrao LM, Raman SV (2007) The role of super oxidized solution in the management of diabetic foot ulcer: our experience. Nepal Med Coll J 9:125

A vertical image on the left side of the slide showing a microscope and laboratory glassware (a funnel and a flask) in a blue-tinted setting.

Re:Covid-19 –

With the impact of COVID-19* being felt around the world, please use the following information to better understand the virus behind the pandemic. Understanding the virus is necessary in learning how combat it along with the correct application of chemistry and changes in process & behaviour.

**** "EPA and the Centres for Disease Control and Prevention (CDC) recognize that certain microorganisms can be ranked with respect to their tolerance to chemical disinfectants. The Spaulding Classification model, used by CDC, tiers microorganisms in accordance with the level of resistance to being killed (inactivation) by typical disinfectant products. With this approach, viruses are divided into three viral subgroups (small non-enveloped, large non- enveloped, and enveloped) based on their relative resistance to inactivation."**

The SARS-Cov-2 virus classifies as the "easiest" to kill being an enveloped virus. A variety of chemical disinfectants combat this but few have the safety and compatibility in comparison with Eco-Lyte. The HoCl chemistry in Eco-Lyte NTL has been proven highly efficient against previous strains of Corona as well as more challenging virus's such as Norovirus, HIV, TB, Avian influenza etc

****https://www.epa.gov/sites/production/files/2016-09/documents/emerging_viral_pathogen_program_guidance_final_8_19_16_001_0.pdf**

*Coronaviruses are a family of viruses that range from the common cold to MERS coronavirus. The latest variant being labelled SARS-CoV-2 by the international Committee on taxonomy of Viruses. *Covid-19 refers to the disease. "Co" refers to corona, "vi" to virus, and "d" to disease*

A vertical image on the left side of the slide showing a microscope and laboratory glassware (a funnel and a flask) in a blue-tinted setting.

Re:Covid-19–

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it's important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow).

At this time, there are no specific vaccines or treatments for COVID-19.

It is not certain how long the virus that causes COVID-19 survives on surfaces, but it seems to behave like other coronaviruses. Studies suggest that coronaviruses (including preliminary information on the COVID-19 virus) may persist on surfaces for a few hours or up to several days. This may vary under different conditions (e.g. type of surface, temperature or humidity of the environment).

https://www.who.int/health-topics/coronavirus#tab=tab_1

A virus is a small infectious agent that replicates only inside the living cells of an organism. Viruses can infect all types of life forms, from animals and plants to microorganisms, including bacteria and archaea.

A background image on the left side of the slide showing a microscope and laboratory glassware (a funnel and a flask) in a blue-tinted setting.

Re: Covid-19 – Will Eco-Lyte kill the virus?

In short, the evidence & scientific logic says YES.

Due to extensive independent & peer reviewed research on the anti microbial and viricidal capabilities (enveloped & non-enveloped) and alongside evidence of prior corona strain disinfection, we with confidence say it will. The long answer is that due to complicated legislation around registered disinfectants there are to date* no products (inc brands of alcohol rub) that can apply a label stating it kills the SARS-CoV-2 strain, due to lack of commercial laboratories with access to the only recent discovered variant. Following recently implemented guidelines by the American EPA several products may now use the terminology "*effective against immersing viral pathogens*". Were the Eco-Lyte brand sold and legislated in the US it would fall under this recommendation. In reviewing a list of approved products by the EPA in the fight against Covid-19, you will find several products that match the chemistry of Eco-Lyte NTL with the active ingredient being HOCl.

If high-care food & beverage producers, doctors, nurses, academic institutions, water treatment professionals & front-line responders trust Eco-Lyte in the fight against infection, so can you.

* March 2020

"The significance of HOCl is increasing as we witness the emergence of resistant microbes, from exotic flaviviruses to highly invasive forms of commonplace *Candida* yeasts. The fields of environmental hygiene, disinfection, food safety, and sanitation are now likely to benefit from HOCl as an untapped resource in infection control."
(Sherry et al., 2017; Clancy and Nguyen, 2017)

Abstracts

“The objective of this study was to compare the hand disinfectant effects between super hypochlorous water and 7.5% povidone-iodine. Subjects included thirty paediatric dentists The disinfectant effects of super hypochlorous water were significantly more effective than that of 7.5% povidone-iodine. “

*PEDIATRIC DENTAL JOURNAL 14(1): 1–3, 2004 . Comparison of the hand disinfectant effects between super hypochlorous water and 7.5% povidone-iodine
Michiko Nishimura, Naoyuki Kariya, Ulanemekh Hulan, Chun Yan Duan and Tsutomu Shimono Department of Behavioral Pediatric Dentistry, Graduate School of Medicine and Dentistry, Okayama University 2-5-1 Shikata-cho, Okayama 700-8525, JAPAN*

“Within the framework of the results of our study, we believe that electrolyzed water can be regarded as a cost-effective disinfectant that is successful in controlling hospital infections...”

Yanik K, Karadag A, Unal N, Odabasi H, Esen S, Gunaydin M. An investigation into the in-vitro effectiveness of electrolyzed water against various microorganisms. Int J Clin Exp Med. 2015;8(7):11463–11469. Published 2015 Jul 15.n controlling hospital infections

“Hypochlorous acid (HOCl) solutions were evaluated for their viricidal ability against a low pathogenic avian influenza virus (AIV), H7N1.....harvested solutions of HOCl after spraying could decrease the AIV titer by more than 1,000 times, to an undetectable level ($< 2.5 \log_{10} \text{TCID}_{50}/\text{mL}$) within 5 sec”

**Hakim, Hakimullah & Thammakarn, Chanathip & Suguro, Atsushi & Ishida, Yuki & Kawamura, Akinobu & Tamura, Miho & Satoh, Keisuke & Tsujimura, Misato & Hasegawa, Tomomi & Takehara, Kazuaki. (2014). Evaluation of sprayed hypochlorous acid solutions for their virucidal activity against avian influenza virus through in vitro experiments. The Journal of veterinary medical science / the Japanese Society of Veterinary Science. 77. 10.1292/jvms.14-0413.*

Abstractscont...

“Over the last two decades more than one hundred reports have appeared in the literature documenting HoCl performance in horticulture, dairy facilities, animal production housing, extended care institutions and hospitals, making a strong case for HoCl as an attractive option for reliable, safe, high-level disinfection within institutional settings. HoCl has shown potent efficacy as a chemical sterilant against resistant spore-forms of key indicator microbes. These and other hygienic use claims have received regulatory approval in the US and the European Union, including approval by USDA for use of HOCl produced on-site as a final food safety rinse for a variety of agricultural products”

(Al Haq et al. 2012, Thorn et al., 2012). (Loshon, Melly, Setlow and Setlow, 2001). (USDA-Food Safety and Inspection Service, 2017).

“Super oxidized water will be an appropriate alternative to currently available antiseptics for disinfection of surfaces and wounds. This product is processed by aqueous solution electrochemically, that is manufactured from pure water and sodium chloride (NaCl). This study represents 12 independent reports of using SOW for wounds. Super oxidized solutions have also other applications on hospital equipment, surface cleansing, and hand washing before an operation, however the focus of this review is just on the healing aspect of the very solution on mostly chronic wounds such as diabetic foot ulcers, post-operative infectious wounds, burns and amputations. The main advantage of pH-neutral SOW is the least skin irritation and its longer shelf time rather than commonly used antiseptics.

The safety findings from included articles indicate that this technology has been effective and safe when applied in different ways (e.g., spray, immersion, irrigation, irrigation), as well as in combination with other technologies. It should be noted that antiseptics such as SOW are considered as an adjuvant treatments superior to necessary medicines as antibiotics.

Med J Islam Repub Iran. .2016;30384. Published online 2016 Jun 7.

Health technology assessment on super oxidized water for treatment of chronic wounds

*Fereshteh Eftekhariadeh, Reza Dehnavieh, Somayeh Noori Hekmat,³ and Mohammed Hossein Mehrolhassani**

Abstracts cont...

“ECAS is a broad-spectrum, non-selective biocide, ... Of particular note is its efficacy against *Cryptosporidium parvum*, a waterborne pathogen that has previously been shown to be resistant to standard chlorine treatment. pH-neutralised ECAS showed significant activity against *C. parvum* oocysts in contrast to little or no activity using a free chlorine solution.

The broad- spectrum antimicrobial activity of ECAS enables high- level disinfection as defined by the Centers for Disease Control and Prevention (CDC), and their favourable biocompatibility means that ECAS are ideally suited as both an environmental decontaminant and in the control or treatment of skin surface or mucous membrane infections.

The effective use of disinfectants within the healthcare environment almost certainly provides widespread protection to both healthcare practitioners and patients against possible contamination with potentially pathogenic organisms. More- over, with the concern over antibiotic-resistant nosocomial infections, new or novel broad-spectrum antimicrobial treatments are in high demand. ECAS have been studied for many years and have been found to be highly efficacious biocidal agents, with increasing reports of their effectiveness in real- world applications; however, they are still not in widespread use, particularly within the healthcare environment. The paucity of wide-ranging clinical trials is likely to be a contributing factor, but recent guidelines do recognise the potential of ECAS for disinfection and sterilisation in healthcare facilities “

Electrochemically activated solutions: evidence for antimicrobial efficacy and applications in healthcare environments
R. M. S. Thorn & S. W. H. Lee & G. M. Robinson & J. Greenman & D. M. Reynolds

Abstracts cont...

“The present study also showed that AEW does not irritate skin and eyes. Mice tolerated the solution for two weeks. In vitro studies also indicate that the AEW generated by the WM-1 is neither toxic to cultured cells nor mutagenic. AEW thus appears to be safe for both patients and endoscopists, and it does not damage endoscopes.”

October 1999: article in Endoscopy: Endoscope Disinfection Using Acidic Electrolytic Water

“Considering the large burden to the environment that has been caused by the intensive use of chemical disinfectants to control devastating infectious diseases such as those caused by HPAI, electrolyzed water might become an alternative disinfectant with favorable ecological features.”

*Virucidal effect of acidic electrized water and neutral electrolyzed water on avian influenza viruses
Ach Virol (2014), Shio Tamaki, Vuong N. Bui, Lai H. Ngo, Haruko Ogawa, Kunitoshi Imai*

“Being able now to apply HOCl in the service of infection control practices is a major advance of the 21st century. Adoption of HOCl as a stable disinfectant may also solve one of the most troubling and persistent gaps of traditional sterilization procedures – prions. Reports have documented the increasing evidence that subtypes of dementia, including Alzheimer’s, may have an infectious component that currently looks like a prion-related protein (Abbott, 2015). Having a disinfectant that can eradicate that risk from surgical instruments and medical facilities is a timely finding, and a welcome advance in infection control technology.”

<https://infectioncontrol.tips/2017/10/06/hypochlorous-innate-response/>

Abstracts cont...

In this study, in vitro bioassay showed that the electrolyzed solution abolished completely the infectivity of HIV-1. The possible mechanisms underlying this abolition are (1) inactivation of the surface protein, as observed in the experiments using HBsAg; (2) destruction of the envelope of the virus; (3) inactivation of viral enzymes; and (4) destruction of viral RNA.

Nath et al. (1982) indicated that partial inactivation of HBV DNA polymerase was observed in the presence of 2500 ppm of free chlorine at neutral pH. Rutala and Weber (1997) reported that the infectivity of HBV and HIV are abolished in the presence of 500 and 5000 ppm for 10 min and 1 min at room temperature, respectively. In the present study, the electrolyzed solution contained only 4.2 ppm of free chlorine and showed greater efficacy against HBsAg and HIV- 1 than sodium hypochlorite.

Journal of Virological Methods 85 (2000) 163–174 Disinfection potential of electrolyzed solutions containing sodium chloride at low concentrations
Chizuko Morita a, Kouichi Sano a,*, Shinichi Morimatsu a, Hiromasa Kiura a,b, Toshiyuki Goto a, Takehiro Kohno a, Wu Hong a, Hirofumi Miyoshi c, Atsuo Iwasawa d, Yoshiko Nakamura d, Masami Tagawa e, Osamu Yokosuka e, Hiromitsu Saisho e, Toyoyuki Maeda f, Yoji Katsuoka

Registrations

NRCS National Registrar for Compulsory Specifications

Registration Certificate

Page: 1 of 2

Concerning **REGISTRATION GRANTED**

of a disinfectant or detergent-disinfectant formulation pursuant to the Compulsory Specification for disinfectants and detergent-disinfectants as published by Government Notice No. R. 529 (Government Gazette No. 33989) of 14 May 1999.

Registration No.: **Act5GNR529/245793/072/0438** Extension No.: -

1. Disinfectant or detergent-disinfectant formulation

Full name of manufacturer, proprietor, controlling company or trade mark holder: **ECA Technologies Africa 2010 (Pty) Ltd**

Product name: **Eco-Lyte**

Product description: **Sodium Chloride Disinfectant**

Strength designation: **0,25%** Retail-Water coefficient (cost per litre): **n/a**

Colour variants: **None**

Perfume variants: **Slight Chlorine Smell**

2. Holder of the registration

Name: **ECA Technologies Africa 2010 (Pty) Ltd**

Address: **9 Racecourse Road
Milnerton
Cape Town**

3. Terms and conditions of issue

3.1 This registration certificate is applicable only to the disinfectant or detergent-disinfectant formulation as identified in it.

3.2 The holder of the registration shall maintain compliance of the disinfectant or detergent-disinfectant formulation with the requirements of the appropriate compulsory specification.

3.3 No modifications shall be made to the disinfectant or detergent-disinfectant formulation itself, its composition and information that shall appear on each container or on a label securely attached to each container as required by the appropriate compulsory specification, without prior notification of the NRCS.

3.4 This registration certificate remains the property of the NRCS and may be withdrawn if any of the conditions attached to its issue are not complied with.

4. Registration granted

Place: **Pretoria** Date: **13/12/2011**

T. Magolego (Mrs.)
Manager: Approvals
NRCS CMM Division

M.E. Phalisse (Ms)
Principal Approvals Inspector
NRCS CMM Division

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"Protecting health, safety, the environment and ensuring Fair Trade"

SABS Commercial (Pty) Ltd test report

REPORT No. 2425/11-1099/F311452

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3. METHOD OF TEST

The sample was tested in accordance with SANS 1853-2009, using the method described in SANS 1615-2011, and subject to the conditions stated in Paragraph 2 above.

4. RESULTS

Bactericidal efficacy

Sample	Dilution	Contact time	Percentage kill of			
			<i>P.aeruginosa</i>	<i>E.coli</i>	<i>S.aureus</i>	<i>S.choleraesuis</i>
Eco-Lyte (NTL) B/N 27/05/11 (F311452)	"As is"	5 min	99,9	99,9	99,9	99,9

REMARKS

When tested in accordance with Section 5.2 of SANS 1615-2011, the relevant dilution of the product shall, within 5 min, kill at least 99.9% of the organisms indicated.

The sample complies.

Mark Kerr
MA KERR
TECHNICAL SIGNATORY

Email: markw@ecatech.co.za

Email: markw@ecatech.co.za

TECHNICAL SIGNATORY
MA KERR
Mark Kerr

SABS Commercial (Pty) Ltd test report

REPORT No. 2425/11-1099/F311452a

Page 2 of 2

3. METHOD OF TEST

The sample was tested in accordance with SANS 1853-2009, using SANS 6266-2009.

4. RESULTS

Virucidal efficacy

Sample	Dilution	Contact time	Percentage kill of	
			36 PH 15597/B1 (MS ₂)	37 PH 13706/B1 (PHI174)
Eco-Lyte (NTL) B/N 27/05/11 (F311452)	"As is"	15 min	99,9	99,9

REMARKS

When tested in accordance with the SANS 6266-2009, each of the relevant dilutions of the product shall, within 15 min, kill at least 99.9% of the organisms indicated.

The sample complies.

Mark Kerr
MA KERR
TECHNICAL SIGNATORY

Email: markw@ecatech.co.za

Email: markw@ecatech.co.za

TECHNICAL SIGNATORY
MA KERR
Mark Kerr

A. Steinmann
A STEINMANN
TEST OFFICER

Applications

Healthcare, Hospitals & Clinics

Rapid Deployment decontamination &

biosecurity Oil, Gas & Mining

Facilities hygiene; prisons, ports, schools, frail care

Agriculture, Aquaculture, Hydroponics etc

Post harvest & food processing

Beverage – Bottling, Brewery, Winery, CIP

etc Animal Husbandry, Poultry, Cattle,

Piggery Hospitality, pools & spa's

Potable, Waste & process Water treatment

Wound care, Dentistry, veterinary

And more...



Eco-Lyte SERVICE-SAN is a safe & easy to work with water based sanitiser featuring HoCl. Used in water treatment, HVAC systems, filters, water storage, C.I.P, hands, tools & equipment etc.



Disinfection - Sanitising - Odor Control - Biofilm Removal

High-level, broad spectrum Biocidal formulation for the reduction & control of bacteria, viruses, mould, fungi, spores & yeast in water systems, filters, HVAC, tanks & more



OSHA's guiding principle – "Don't use hazardous chemicals if a less hazardous one is available." *In other words, if there is a safer way to perform a job, choose the safer way*

Natures chemistry
Gentle on hands
3 ingredients
Zero alcohol



Rapid pathogen destruction
Trusted by professionals
Skin healing properties
Family safe

Eco-Lyte
Science & Nature in Harmony

The power of HOCl in the fight against infection
Ph: 021 3000 434
info@ecatech.co.za
www.ecatech.co.za



Anti-microbial
Anti-viral
Efficient
Fast
Safe

just Eco-Lyte it



Eco-Lyte
Science & Nature in Harmony

eca
TECHNOLOGIES AFRICA

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Howick
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