

# HOUSHOLD BLEACH

## OVERRATED AND OVERUSED AS A DISINFECTANT

Reprinted and edited with permission from: Dr James H. Berino, PhD, Chemist Director of Research, The Champion Company. By Robert J Saldivar MS, Animal Science, Sanitation Specialist, Texas A&M University. The Champion Company is one of the leading research and manufacturers of sanitation Chemicals for the medical and mortuary industries.

Dr. Berino writes:

Common house hold bleach (sodium hypochlorite) is overrated and overused as a disinfectant and should be used **only** if another alternative is not available. A CDC document that advocated the use of bleach during the AIDS scare in 1987 launched the widespread use of “bleach as a disinfectant”. A close look at the document reveals that the CDC **did not advocate “bleach” in lieu of other disinfectants, but merely a statement that “bleach” was effective if no other registered or approved disinfectants were available for use.** The latest revision of this document (1995) calls notice to the limitations of “bleach” in high organic debris, blood and or body fluids. Even in the situation with HIV, which is a very labile virus from a disinfection standpoint, **“bleach”, (SODIUM HYPOCHLORITE) has several documented failures.**

**“Bleach” disinfection:** Dr, Berino writes; despite the fact that “bleach” is aqueous sodium hypochlorite, the manufacturers add sodium hydroxide (**lye**) and in most cases this is what actually disinfects in “bleach” and ruins everything. A **pure sodium hypochlorite** solution contains no sodium hydroxide (**LYE**).

The actual disinfecting species in any hypochlorite solution is **hypochlorous acid (HOCL)** not sodium or calcium hypochlorite. When one refers to the free available chlorine in a disinfectant, this denotes the sum of all chlorine species in solution and does not relate directly to the efficacy of a chlorine disinfectant (due to the pH differences that exist in varying hypochlorite solutions.)

The basic problems plaguing “bleach” as a disinfectant are two fold, **first** as any hypochlorite solution it starts loosing potency the minute it is manufactured, **second** is the fact that the % of hypochlorous acid in the solution is severely affected by the pH of the solution. Typical “bleach” has a very high pH, typically 11 (far too high for any significant HOCL (hypochlorous acid) to be present in the solution. In fact, the quantity of HOCL is only 20% at a pH of 8 and degrades to less than 0.24% at pH 11. Consequently no amount of “bleach” used will deliver a sufficient quantity of active disinfecting chlorine species, instead releasing dangerous and pungent chloramine gas during the application.

Many investigators reveal “bleach” purchased at retail consumer stores usually has degraded to less than 2% hypochlorite in solution and a pH in excess of 11, indicating that chemical dilution of the product, itself, has already occurred, offering very little chlorine disinfection, and that in most cases it is the lye that actually does the disinfecting needing long wet contact times and creating other problems as well as poor disinfection,.

Only when the pH drops to around 7 does the quantity of hypochlorous acid in solution become substantial and disinfecting power increases drastically. This is the explanation for the successful use of chlorine type powders and tablets sanitizers in the swimming pool, food, animal and medical industry where most solutions are buffered to pH 7 to 8 allowing a good quantity of HOCL to be present in the disinfection solution. Most of these powders and tablets such as calcium hypochlorite and sodium dichloroisocyanurate contain large amounts of chlorine (usually 65%) and are very stable. These powders and tablets are capable of releasing large quantities of active chlorine disinfecting species in a short time frame with out the limitations of “bleach” and its dilutions.

Point of use chlorine generators using buffered and metered calcium hypochlorite tablets are very efficient and very popular in Europe, Australia and Africa, for disinfecting food products, food plants, produce packing sheds, animal facilities, public use facilities, ambulances and veterinary clinics. These devices are gaining popularity in the United States. “Bleach” solutions are a poor disinfectant choice, considering the drawbacks and excellent alternatives available.