

Efficacy of Green Cleaning Products with Respect to Common Respiratory Viruses and Mold Growth

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ABSTRACT

As infection prevention and control concerns continue to move mainstream into our communities, schools, offices, etc., so too does the increased usage of cleaning chemicals and disinfectants. The increased usage of many of these chemistries has the potential to negatively impact the environment and therefore, many end users are searching for “greener” alternatives. A major concern in this trend is the implementation of cleaning products that are simply ineffective in killing certain microorganisms. The increasing prevalence of hydrogen peroxide, an environmentally preferable ingredient with limited antimicrobial efficacy on its own, has the potential to exacerbate this concern. Many manufacturers of hydrogen peroxide-based cleaners are positioning their products as effective disinfectants without validation leading to potential misperception. This article also highlights the results of an evaluation of Green Cleaning Products (GCPs) and Traditional Surface Disinfectants (TSDs) and their respective efficacy against common respiratory viruses and mold.

BACKGROUND

Accelerated Hydrogen Peroxide[®] (AHP[®]) Technology has gained a reputation for being the most effective and safest cleaning and disinfection chemistry on the market in Canada and the USA. AHP[®] based cleaners have been recognized in the US by Green Seal as environmentally friendly and by GreenGuard as low emitting. The EPA’s Design for the Environment’s Safer Detergent Stewardship Initiative (SDSI) also awarded AHP[®] with

Champion status. AHP[®] disinfectant products are uniquely designed to balance exceptional germicidal performance, including efficacy against more difficult to kill pathogens including non-enveloped viruses (Norovirus, Rhinovirus, Polio Virus, etc.) with superior health, safety and environmental profiles. In fact, AHP[®] was the first disinfectant chemistry to achieve EcoLogo Certification in Canada under the new UL2794 criteria set forth by Underwriter Laboratories. Furthermore, the EPA now uses alternative assessments to look for safer chemicals. Design for the Environment (DfE) is a program that characterizes chemical hazards based on a full range of human health and environmental information. Chemical choices made based on these assessments can minimize the potential for unintended consequences that might occur in moving from a potentially problematic chemical to a poorly understood alternative, which could be more hazardous. New AHP formulations have been designed to meet DfE standards to ensure the technology maintains one of the safest toxicity profiles on the market.

GREEN CLEANING PRODUCTS

Generally speaking, GCPs are marketed as safer alternatives to replace disinfectant and cleaning chemistries. They typically claim: reduced emission of volatile organic compounds (VOCs); lowered toxicity to aquatic organisms; improved biodegradability and reduction of worker injury. In many situations these sentiments are true, however concerns have been expressed by cleaning professionals regarding the use of GCPs in situations where antimicrobial efficacy is

needed. Despite being certified by Green Seal in the US as a means to facilitate identification and purchasing, GCPs are not validated for efficacy against bacteria, viruses or fungi by the US Environmental Protection Agency (EPA). While mechanical cleaning with a GCP may physically remove harmful pathogens from a surface, effective control against the spread of infection truly requires the use of EPA or DIN registered disinfectants. Therefore, it should be no surprise that the Association for the Healthcare Environment (AHE) (formerly known as ASHES) warns against blanket support of GCPs without validation that they provide the same level of care and warns against their adoption in certain situations for the sake of going “green”.

GREEN CERTIFICATION

Throughout this article the author consistently refers to the Green Seal certification of the GCPs. Green Seal is a non-profit organization which evaluates cleaning products on various criteria including soil removal, toxicity, combustibility, aquatic toxicity and biodegradability and certifies those that minimize impact to, and promote protection of, the general environment. The emission of VOCs is another potential hazard associated with traditional cleaning and disinfectant chemistries identified and discussed by the author. GreenGuard, an industry independent, third party testing program seeks to identify low emitting products through their certification process. Both Green Seal and GreenGuard provide a reputable and consistent means of identifying “greener” cleaning alternatives.

TRADITIONAL SURFACE DISINFECTANTS

All Surface Disinfectants are employed with the same goal in mind: to effectively kill or inactivate certain microorganisms on a surface. It is this role, and the very nature of disinfectants in general, that has perpetuated the thought that disinfectants simply cannot be environmentally sustainable or preferable. While this is true of many of the legacy disinfectant chemistries

(Chlorine, QUATs, Phenolics, etc.), it is unfortunate that all disinfectant chemistries get painted with the same brush. No doubt, it is common that legacy disinfectants negatively impact indoor air quality, have poor biodegradability and linger in the environment for some time, however, newer technologies have sought to address these concerns through the selection of safer active and inert ingredients.

HYDROGEN PEROXIDE

Hydrogen Peroxide is arguably one of the oldest and safest antimicrobial agents. As the focus on green and sustainable products continues, the use of hydrogen peroxide as an ingredient in cleaners and disinfectants will undoubtedly increase in popularity. This article highlights hydrogen peroxide’s proliferation in the market, as 12 of 27 GCPs evaluated by the author contained hydrogen peroxide. However, it is important to understand that the simple inclusion of hydrogen peroxide in a cleaning product does not automatically translate into antimicrobial efficacy. Unfortunately, certain chemical manufacturers prey upon this presumption, bringing to market general purpose cleaners that contain hydrogen peroxide which creates a false sense of security. Not surprisingly, there is specific interest growing in Hydrogen Peroxide as an active ingredient for disinfection, herein lays the problem. There is no novelty to formulating with Hydrogen Peroxide when making “cleaners”; however, there are significant technological challenges when one attempts to use Hydrogen Peroxide as an active ingredient in a complex formulation with a view to rapid disinfection, without compromising the safety and environmental profile of the resultant formulation.

CONCLUSION

Although the move to greener chemicals is a noble gesture, it should not be a decision that is made without careful consideration. A switch to certified GCPs in non-critical areas, where the level of care will not be

affected, would be considered a worthwhile venture in an effort to reduce our potential impact on the environment. However, as outlined by this article, the replacement of registered disinfectants with certified GCPs does pose serious concern. As noted by AHE, we cannot lower our level of care just for the sake of going “green”. This does not mean we cannot evaluate or consider “greener” disinfectant options. While the US EPA does not currently recognize or allow “green” claims on registered disinfectants, they are evaluating a change in this policy. Newer disinfectant technologies have come to market offering exceptional germicidal efficacy and a superior environmental profile. If or when the EPA policy is changed, these chemistries will be poised for success by offering a unique balance of efficacy and environmental safety. In Canada, a similar policy has already been adopted. Health Canada, understanding the importance of allowing facilities to easily select safer chemistries, has allowed DIN registered disinfectant products to carry third party “green” certification such as EcoLogo if they meet the criteria set forth by the deciding body (Underwriter Laboratories in the case of

EcoLogo). As stated by the author, selection of cleaning and disinfection products should consider not only performance within a single criteria – cleaning efficacy, germicidal efficacy, health and safety profile and environmental profile – but rather the product’s ability to balance effectiveness across all criteria without compromise.

REFERENCE

Light E (2009). Efficacy of “green” cleaning products with respect to common respiratory viruses and mold growth. *J Environ Health*. 71(9): 24-7.