

Innovation: Silver Is The New ‘Green’

By Michael L. Krall

August 3, 2009



Michael Krall

In spite of the sustained economic downturn, consumer demand for “green” products is on the rise. According to a recent study by Green Seal, consumers purchased \$290 million worth of natural household cleaners and supplies in 2008, and this is expected to grow dramatically in the next 5 years. The Green Seal study indicates that four out of five consumers are buying green products and services – and 19% say they are buying more green products than in the previous year.

Consumer outcry against companies that make products using toxic chemicals continues to intensify. For example, bleach-based products are corrosive and can cause severe chemical burn damage to eyes and skin and may release harmful vapors. Inadvertently mixing of bleach with acids or ammonia will release dangerous chlorine or chloramine gas, which can cause acute respiratory irritation and, in extreme cases, asphyxiation. In Europe, formaldehyde-based Triclosan, found in nearly every personal care product on the market, will soon be banned, creating additional demand for new, non-toxic chemical formulations.

Ironically, the majority of mainstream household and consumer products with a “green” label do nothing more than dilute the toxic chemicals that consumers have relied on for years. Although this results in a slightly less toxic and slightly more environmentally friendly chemical formulation, its efficacy is often compromised. The concept is hardly groundbreaking, and as consumers become more educated on this market, the pressure will be on companies to develop and deliver only truly clean technology.

As the green movement continues to pick up steam, consumers will demand products that are both good for the environment, yet just as effective as harsh chemicals. This is especially true with the rising threat of serious global health concerns, such as MRSA, which continues to plague schools, hospitals and locker rooms across the country, and most recently H1N1, as the Obama administration and other worldwide officials have begun preparing for another wave of the virus in the fall.

The good news is there are a number of innovative technologies on the market today that offer highly effective alternatives to traditional chemicals, proving that products don't need to be toxic to be effective. However, these new formulations are typically "disruptive" technologies, which require consumers, regulators and industry leaders to adopt them in place of incumbent technologies – a process that is typically very slow.

Case in point: silver-based technologies are re-emerging as an effective solution to this dilemma. Silver has been used successfully for centuries to control microorganisms and there is little clinical evidence it will cause the development of resistant strains of bacteria – unlike many chemicals on the market today. Hippocrates, the father of modern medicine, wrote that silver had beneficial healing and anti-disease properties, and ancient cultures stored food, water and other liquids in silver vessels to prevent spoilage.

Since then, several industries have embraced silver as a natural and effective antimicrobial solution, with silver technologies now prevalent in food processing and packaging materials, water treatment equipment, textiles, construction products, and HVAC systems. Increasing consumer awareness and use of silver as an antimicrobial continues to rise as more and more domestic and international companies are integrating silver technologies into plastics for various products.

One of the newest forms of silver is a molecule called Silver Dihydrogen Citrate (SDC), which is the only electrolytically generated source of stabilized ionic silver available, and the first new antimicrobial to be approved by the EPA in more than 30 years. The molecule is generated through a proprietary process and combines with one or more organic acids to form a stable, efficacious new antimicrobial active or preservative. SDC formulates well with other compounds, acting as both a preservative and biocide that harnesses the antimicrobial properties of silver.

Ionic silver's multiple modes of action are believed responsible for its quick and broad-spectrum efficacy. Creating a stabilized ionic silver formulation opens the door for its use in a wide array of products and treatments-including personal care, food and water, textiles, agriculture and pharmaceuticals as well as consumer, commercial and industrial sanitization and disinfection.

As the movement toward green technologies continues, it is critical that consumers become educated on the innovative technologies available today that do more than simply dilute harsh chemicals. It is equally important that the EPA and regulatory bodies prioritize the evaluation and approval of new, greener technologies to bring to market more effective and environmentally friendly formulations.

As a proprietary "disruptive technology" in the antimicrobial field, SDC is the first to emerge from its development platform as a biocide with broad spectrum activity. PURE Bioscience, which developed, patented and supplies SDC, has partnered with several companies, including Ciba (now BASF) and Cleveland Clinic, to develop, market and sell the final products. SDC's

applications include: deodorant active for personal care products, anti microbial active ingredient for personal care products, preservative for personal care products and biocide for household and hospital products including disinfectants that protect against such harmful virus strains as Staph, E. coli and Influenza A. Additional applications exist in wound care, pharmaceuticals, agriculture, industrial and commercial biocide products.

In May, the U.S. Environmental Protection Agency (EPA) published a list of antimicrobial products, including SDC-based disinfectants that are effective against the 2009 H1N1 flu strain based on their effectiveness against other Influenza A virus strains. Furthermore, disinfectants containing PURE's SDC antimicrobial also meet the CDC recommendations for infection control of Swine Influenza A (H1N1). With these recommendations, distributors of the PURE's silver dihydrogen citrate-based disinfectant are well-positioned to respond immediately to the growing health crisis and declarations by the World Health Organization that the Swine Flu outbreak continues to be a pandemic.

According to Griffin Securities, PPURE Bioscience has a novel, patent-protected biocide that is in sync with the forces that are reshaping the specialty chemicals market. Not only is SDC a potent antimicrobial agent with multiple mechanisms of action, but it is also rated in the "lowest toxicity" class (Category IV) of the U.S. Environmental Protection Agency. This contrasts with today's commonly used products, which typically have a single mechanism of action (rendering them more susceptible to the development of resistance) and are usually ranked in the EPA's "high toxicity" class (Category II).

The specialty chemical industry will face continued pressure from regulatory bodies as well as from consumers, who are increasingly concerned about the toxic properties of many of today's biocides. The investment opportunity for technologies that satisfy this niche will be substantial. Clearly, the scientific community's interest in silver as an antimicrobial agent has been piqued due to its good safety profile and ability to formulate well with other compounds, which will help meet the growing demand for "greener" biocides across multiple markets.

*Michael Krall is Founder and Chief Executive Officer of **PURE Bioscience**, creator of the patented SDC molecule. The Company has a partnership with specialty chemical manufacturer Ciba (which was acquired by BASF), to market SDC in a variety of personal care products, replacing Triclosan in favor of a non-toxic, green formulation. The Company also has distribution agreements in place with Orchem Corporation, Rockline Industries and DuraBan International to market SDC-based products, particularly as a hard surface disinfectant and as disinfectant wipes. In addition, SDC also has application in agriculture, as it has shown remarkable ability to kill fungus on soybeans, and is already in use purifying water in Africa.*