THE SILVERINSTITUTE

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Silver News

The Silver Promotion Service Opens "Virtual Silver Pavilion"

Digital Platform Highlights Latest Designs from Leading Silver Brands

Click the image to visit the *Virtual Silver Pavilion*

The Silver Institute's Silver Promotion Service (SPS), which focuses on stimulating demand for silver jewelry, has launched a Virtual Silver Pavilion on the SPS website. The site allows jewelry trade members, media and the general public to browse the newest designs from leading silver designers.

Inspired by recent consumer research indicating pent-up demand for silver jewelry, this digital platform showcases 'must-have' silver styles available for purchase. The research confirmed that 50% of survey respondents who were planning to buy jewelry indicated that it would be silver.

The pandemic-related cancellations of 2020 trade shows, coupled with recent research confirming consumer purchase intentions for silver jewelry, spurred the SPS to create a digital platform for *Savor Silver* brands. The platform, which consists of 23 branded jewelry lines, highlights jewelry makers' newest designs.

In addition, educational information is offered highlighting the latest professional tips on topics that range from merchandising to fashion trends.

Educational topics include:

- *More on Merchandising – Make It Count*: Discover ways to enhance the visual story being conveyed by store displays and the in-store environment/experience.
- *The Silver Lining to Retail Sales*: Identify the ideal target customer and explore optimal ways to attract those key consumers.
- *I Do Want to Build My Bridal Business*: Learn to drive sales and increase margins with consumer research insights and silver jewelry options from engagement and beyond.
- *Happy Hour*: Sharing the latest information on autumn 2020 trends and the role of silver in fashion, as well as jewelry wardrobe classics that deliver turnkey results.

Silver Catalyst Helps Produce More Carbon Dioxide, a Precursor for Everyday Chemicals

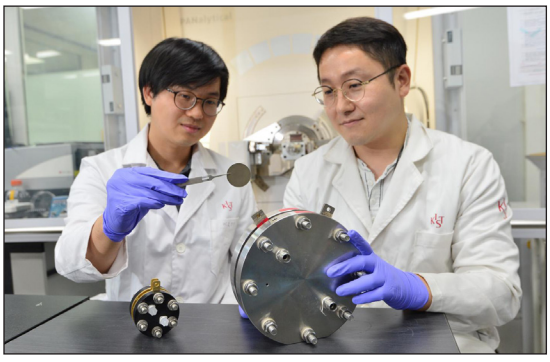
Although carbon monoxide is poisonous to humans, it is a critical component of many chemicals including synthetic gas, acids, alcohols and ammonia.

Most research into producing carbon monoxide from carbon dioxide has focused on its liquid state, not its natural gaseous state, but these conversions are inefficient because carbon dioxide does not dissolve well in water.

This impediment to further research may be disappearing. Scientists at the Clean Energy Research Center of the Korea Institute of Science and Technology (KIST), working with the Technische Universität Berlin (TUB), have developed a silver catalyst electrode that converts carbon dioxide – a contributor to pollution and climate change – to carbon monoxide in artificial photosynthesis.

The catalyst electrodes are coral-shaped and nano-sized, and compared to other silver catalysts they require a low amount of energy to achieve a reaction. Researchers also say they can produce over 100 times more carbon monoxide than liquid-based systems.

"By developing nanometer-sized, coral-shaped silver catalyst electrodes, we were able to greatly improve current density and the performance of the electrochemical carbon dioxide conversion system, thereby suggesting directions for future research," said Hyung-Suk Oh of the KIST, who jointly led the research. "It is expected that this study will greatly contribute to the R&D of electrochemical carbon dioxide conversion systems."



KIST

A research team, led by Hyung-Suk Oh and Woong Hee Lee of the Clean Energy Research Center have developed a silver catalyst electrode that converts carbon dioxide to carbon monoxide, a common precursor to many chemicals.

Silver and Strontium Work Together for Safer Implants

Researchers from the Delft University of Technology have designed and 3D-printed a porous titanium bone implant that contains strontium, which is a soft silver-white metallic element that is highly chemically reactive, and silver nanoparticles, a combination they say kills the antibiotic-resistant *Staphylococcus aureus (S. aureus)* bacteria.

S. aureus is often found in biofilms that surround implants and can become deadly through infection of the blood or organs. Because the bacteria are resistant to antibiotics, compromised implants, such as those found in hip replacements, are usually removed by surgery and replaced with new ones.

Although silver ions are a common choice to kill the bacteria – and implants are often imbedded with silver for that reason – the researchers suggest that synergistic antibacterial behavior between the strontium and silver may give rise to implants that could outlive the recipient.

Each year in the US, more than 600,000 knee replacements and 330,000 hip replacements are performed, according to Harvard Health Publishing, so any implant life extensions would reduce surgeries and increase the patient's health.

The Dutch researchers found that strontium encouraged bone growth while the silver provided the antibacterial properties. The team observed that both active agents were continually released for up to 28 days, according to their published findings, and that the *Staphylococcus aureus* strain was virtually non-existent after 24 hours of surface contact.

The researchers also discovered something that will prompt further exploration. While in the presence of strontium, lower concentrations of silver were required – 4 to 32 times lower – to kill the bacteria even though strontium does not possess any antibacterial properties itself.

So far, all work has been performed in the laboratory and the researchers hope to move it to clinical trials as soon as possible.

The research was published in *Materials Today Bio*.

U.S. EPA Registers New Nanosilver Active Ingredient as a Materials Preservative

The US Environmental Protection Agency (EPA) has registered NSPW Nanosilver, a new, active silver-based ingredient that helps suppress odor-causing bacteria, and algae, fungus, mold and mildew that can cause deterioration or staining in textiles, government officials announced.

NSPW Nanosilver is found in the pesticide product *Polyguard-NSPW Master Batch*, also known as Polyguard, which is embedded within plastic beads or pellets. These beads are made from material similar to nylon or polyester which are incorporated/infused into textiles through a closed-loop manufacturing process called extrusion. Once introduced into the process, no beads or pellets can escape into the environment, EPA officials said.

Based on EPA's human health and ecological risk assessment, the agency has determined that the new active ingredient, NSPW Nanosilver, meets the regulatory standard under The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) which is a US federal law that established a basic system of pesticide regulation to protect applicators, consumers and the environment.

The EPA's registration statement can be found here.

Possible Consequence of the Coronavirus: Legionnaires' Disease Bacteria in Buildings

University Studying How Silver Can Kill the Dangerous Bacteria

The US National Science Foundation has awarded $330,000 to a team of researchers at the University of Pittsburgh, Pennsylvania, to examine the effect that silver, embedded in shower fixtures, has on water disinfection. While many facilities, including hospitals, have installed silver-based water filtration systems to keep disease at bay, facility managers and health officials are concerned that water pipes left unused and unflushed during building closings due to the coronavirus pandemic have become a breeding area for dangerous bacteria. Long stretches of stagnation can result in low to no disinfecting chemicals being present in building water that can create an ideal growth environment for many microbes, the researchers noted.

One fatal bacterium in particular, *Legionella pneumophila,* known to cause the deadly respiratory malady known as Legionnaires' Disease, inhabits water pipes and tanks especially in older buildings or buildings that do not have a regular flushing schedule or continual usage.

The bacteria can become airborne simply by turning on a faucet or flushing a toilet.

Sarah Haig, assistant professor of civil and environmental engineering at the University of Pittsburgh, said in a prepared statement, "Typically, the drinking water entering buildings contains a disinfectant residual, such as chlorine, to help prevent and reduce microbial growth. However, changes in water chemistry, building fixtures and building operation, like the long periods without water use (stagnation) recently observed across the world during the COVID-19 pandemic, will have unexpected consequences on building water quality."

"Conditions in the water systems of about 50 percent of large buildings promote *Legionella* growth and spread. Fatal infections occur at a rate of up to 30 percent in hospitals and 10 percent in the community," added Janet E. Stout, president of the University's Special Pathogens Laboratory and a widely-known expert on Legionnaires' Disease.

SARAH HAIG

The research will take place at the INHALE Lab in the Swanson School of Engineering at the University of Pittsburgh.

Perth Mint Celebrates Chinese "Year of the Mouse" with Silver Bullion Products

The Perth Mint (Australia) has produced several silver bullion products for 2020 celebrating the *Year of the Mouse*.

These coins include:

- A 2-ounce proof colored .9999 silver coin showing on the reverse two mice among pumpkins along with the Chinese character for 'mouse.' Maximum mintage is 500 and the cost is AUS$180. The coin is legal tender with a face value of AUS$2.
- Part of the *Opal Lunar Series coins* which includes an Australian opal insert with one ounce of .9999 silver. Mintage is 5,000 with a legal tender value of AUS$1. The cost is AUS$ 118.18.
- A gold-plated sterling silver rotating mouse-shaped bead within a .9999 silver rotating charm (not legal tender) within a 1-ounce .9999 antiqued coin. Mintage is 3,000 and sells for AUS$140.
- A 10-kilogram, .9999 silver coin will be produced on a mint-to-order basis with production ending at the end of this year. Maximum mintage is 100 and the legal tender coin will have a face value of AUS$300. The coin's reverse portrays two mice foraging on husks of corn. Also included in the design is the Chinese character for 'mouse,' the inscription 'MOUSE 2020' and The Perth Mint 'P' mintmark. The obverse of the coin depicts Her Majesty Queen Elizabeth II. The pre-sale cost from retailers is about AUS$26,000.

PERTH MINT

This 10-kilogram .9999 silver bullion coin from the Perth Mint celebrates the Chinese Year of the Mouse.

Mumbai Jewelry Maker Hopes to Keep "Arts and Crafts" Alive in India

Hoping to preserve what they consider the "fading arts and crafts of India, while providing workers with a much-needed livelihood," Jai and Amrita Dalal established Mishka Gifts in Mumbai, India in 1990.

The Babson College (Wellesley, Massachusetts) MBAs, started their manufacturing business with exporting diamond-studded gold jewelry before moving to customized silver articles suitable for corporate and celebratory gifting. "The idea was to give an impetus to the beautiful handcrafted silver articles manufactured by skilled artisans in rural villages of India," said Jai Dalal.

Their products include exclusive hand engraved pieces, traditionally called *nakshi* from Rajasthan, and filigree work from West Bengal. Miniature paintings are also a specialty. Recently, they have begun crafting larger articles by overlaying silver on carved wood.

For more information on their products, click here.

New Machine Produces Silver-Atom Clusters for Clean-Water Catalyst

Other Applications for Clusters Expected to Follow

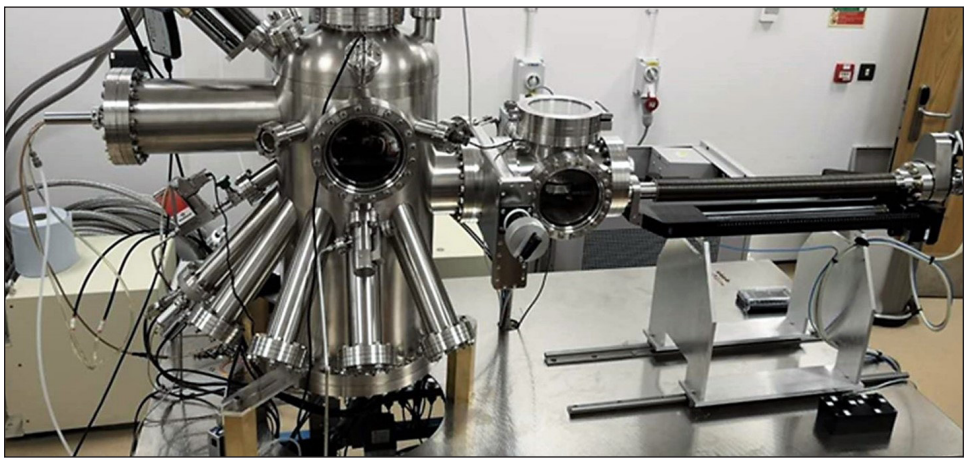
Researchers from Swansea University (UK) have developed an environmentally-friendly, no-solvent approach, for removing toxic chemicals from water. The method employs a newly-invented machine called the Matrix Assembly Cluster Source (MACS), which produces a catalyst composed of silver atoms.

"The harmful organic molecules [in water] are destroyed by a powerful oxidizing agent, ozone, which is boosted by a catalyst," said Professor Richard Palmer, of The Institute for Innovative Materials, Processing and Numerical Technologies (IMPACT), part of the university's College of Engineering, in a prepared statement. "Usually such catalysts are manufactured by chemical methods using solvents, which creates another problem – how to deal with the effluents from the manufacturing process." Instead, the MACS produces the catalyst by physical methods. The catalyst particles are clusters of silver atoms, made with the newly-invented MACS machine.

Palmer noted that the clusters are about 10,000 times smaller than the width of a human hair and have been of significant interest to researchers because of their unique properties. However, applications have been limited because up until now scientists have not been able to produce enough clusters for large-scale research. Now, with the MACS, the problem of too few clusters has been solved.

Palmer concluded: "The MACS approach to the nanoscale design of functional materials opens up completely new horizons across a wide range of disciplines – from physics and chemistry to biology and engineering. Thus, it has the power to enable radical advances in advanced technology – catalysts, biosensors, materials for renewable energy generation and storage. It seems highly appropriate that the first practical demonstration of Swansea's environmentally-friendly manufacturing process concerns something we are all concerned about – clean water."

The IMPACT operation is part-funded by the European Regional Development Fund through the Welsh Government and Swansea University.



IMPACT

This newly-invented Matrix Assembly Cluster Source (MACS) machine produces a catalyst composed of silver atoms.

Liquid X's Silver Ink Certified Safe for Human Contact by OEKO-TEX Test Institutes

Liquid X, a Pittsburgh, Pennsylvania-based company that manufactures metallic inks, has received certification from OEKO-TEX – a group consisting of 18 independent research and test institutes in the field of textile and leather ecology in Europe and Japan – which has certified that the company's particle-free silver ink is safe for contact with human skin.

"With the new *OEKO-TEX Standard 100 Certification*, our inks can now enable wearable applications that require contact with skin and the ability to withstand sweat and/or saliva, such as electrodes for health and wellness monitoring," said Bill Babe, sales and marketing manager at Liquid X in a prepared statement.

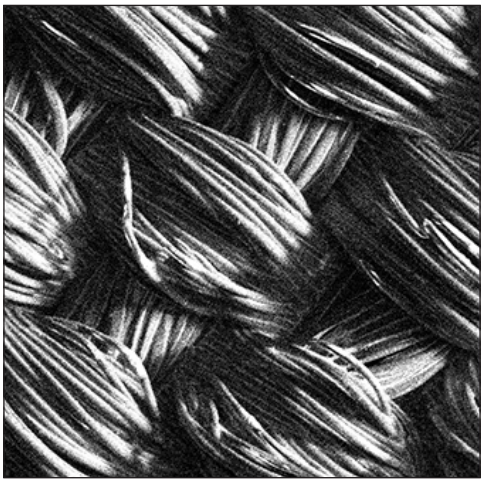
According to Babe, the certification label is earned by textiles deemed safe for contact with skin after testing for harmful substances like carcinogens and heavy metals. The ink is deemed safe for babies and toddlers as well as older people.

Liquid X's silver inks are woven into threads to produce circuitry and sensors built into textiles. The silver ink not only allows the flow of electricity but offers antibacterial protection, too.

"Typically, our inks functionalize a surface, like a textile, to create an electronic device that can bend and flex in ways traditional electronic devices cannot," said Beth Vasy, vice president of operations at Liquid X. "We can also use derivatives of our ink formulations to create low-cost, and even transparent, antimicrobial coatings for high-touch surfaces, medical gowns, hospital curtains, automotive upholstery and more."

The company has recently introduced a face mask which includes a pocket for an antibacterial filter insert which features Liquid X's silver ink.

According to OEKO-TEX officials, if a textile carries the *Standard 100* label it means that "every component of this article, i.e. every thread, button and other accessories, has been tested for harmful substances and that the article therefore is harmless for human health. The test is conducted by our independent OEKO-TEX partner institutes… In the test they take into account numerous regulated and non-regulated substances, which may be harmful to human health. In many cases the limit values for the *Standard 100* go beyond national and international requirements." The testing and certification organization was established in 1992.



Electron microscope image of Liquid X's particle-free ink on woven polyester fabric.

Larry Kahaner
Editor

www.silverinstitute.org
@SilverInstitute on Twitter

THE SILVERINSTITUTE
1400 I Street, NW, Suite 550
Washington, DC 20005
T 202.835 0185
F 202.835 0155