CHEMWATCH

BULLETIN

Week of 13 March 2026

GOSSIP | CURIOSITIES | REACH UPDATE | REGULATORY UPDATE | HAZARD ALERT | JANET'S CORNER

CONTENTS

GOSSIP

CURIOSITIES

REACH UPDATE

REGULATORY UPDATE

ASIA PACIFIC

New fact sheets on advisory notations in the workplace exposure limits (WEL) list

Outcome of consultation

AMERICA

Chemical Profile for Preservatives in Leave-On Products Comment Period Starts

EPA Requests Public Input On Charge Questions To e-Manifest Advisory Board And On Potential Topics For e-Manifest System Industry Users Conference

Tensions rise as WV Senate passes bill to loosen regulation of storage tanks near drinking water

PHMSA Proposes HMR Amendments To Harmonize With International Standards

EPA Rescinds GHG Endangerment Finding And Motor Vehicle GHG Emission Standards Under The CAA

EUROPE

GB maximum residue levels (MRLs) amendment (adopted 17 January 2026)

HAZARD ALERT

Acrylic Acid

JANET'S CORNER

Who Am I?

GOSSIP

US approves first next-gen nuclear reactor in a decade

New Atlas · 8 Mar 2026

The United States has taken a step toward a 21st-century renaissance in civilian nuclear power as the Nuclear Regulatory Commission (NRC) has given the go-ahead for TerraPower's Natrium Gen IV reactor to begin construction – the first such approval for a US reactor in a decade.

Once a global leader in nuclear power, the US created many of the Generation I and Generation II reactor designs on which much of today's nuclear fleet is based. However, in the 1970s there was a major shift in American civilian nuclear policy. Nuclear fuel reprocessing and fast breeder reactor programs were terminated, the environmental movement – broadly hostile to nuclear power – gained influence over federal policy, and the Three Mile Island accident in 1979 severely damaged public confidence in nuclear energy.

As a result, the Energy Reorganization Act of 1974 was passed, followed by the Kemeny Commission investigation after the Three Mile Island incident in 1979. Control of the US civilian nuclear program shifted from the Atomic Energy Commission to the newly formed Nuclear Regulatory Commission (NRC), whose mandate focused primarily on safety rather than the promotion of nuclear power development.

The combination of increasingly complex regulations, long approval timelines, high costs, and frequent legal challenges from activist groups dramatically slowed new nuclear projects.

As a result, no new reactors were built in the United States for decades, and the last new reactor application approval occurred roughly ten years ago.

Now, the US government is looking to revive the nuclear sector with a more streamlined regulatory process aimed at encouraging the construction of new plants while maintaining safety standards.

A key example is the Natrium Demonstration Project for Kemmerer Power Station Unit 1 in Kemmerer, Wyoming. The plant is being developed by US SFR Owner, LLC (USO), a special-purpose vehicle and wholly owned subsidiary of TerraPower. A participant in the US Department of Energy's Advanced Reactor Demonstration Program (ARDP), construction on the plant's non-nuclear civil engineering components has been underway since 2024 . With the NRC's approval, work on the nuclear portions of the facility can now begin.

As a Generation IV reactor, Natrium is notable because it will be the first non-light-water reactor built in the United States since the 1980s. The project has also progressed at an unusually rapid pace for American nuclear development. The technical design review was completed in under 18 months, the formal application was accepted in...

Read More →

Microplastic biofilms carry genes that could alter nutrient cycling in estuaries

Phys Org · 11 Mar 2026

A study led by William & Mary's Batten School of Coastal & Marine Sciences & VIMS and published in FEMS Microbiology Ecology reveals that microbial communities growing on microplastics in the Chesapeake Bay carry the genetic potential to remove nitrogen from the water and break down petroleum-related compounds. The manuscript was selected as the journal's best paper of 2025, which recognizes researchers who have pushed the boundaries of knowledge in the field of microbiology.

"This wasn't best student paper, this was best paper, from a very respected journal," said co-author Rob Hale, professor at the Batten School & VIMS, noting that lead author Samantha Fortin conducted the study while earning her Ph.D. at the Batten School while collaborating with fellow student Kelley Uhlig.

The researchers used metagenomic sequencing , an advanced environmental DNA (eDNA) technique, to study microbial communities that developed on three different types of microplastics while submerged in the York River where it meets the Chesapeake Bay.

Scientists packed fiberglass mesh bags with small beads of polyethylene (PE), polyvinyl chloride (PVC) and the biopolymer polylactic acid (PLA), suspended them near the top of the water column, and analyzed the microbial communities growing on the plastics after seven, 14 and 28 days.

"I was very excited to see so many denitrification genes, because we don't normally think of that process being able to happen in the oxygenated water column," said lead author Samantha Fortin, now a postdoctoral researcher at Princeton University.

"These microplastics develop fast-growing biofilms that can support micro-anoxic environments. We usually think about plastic's toxicity or the negative effects it might have on animals, but we haven't really thought a lot about how it might impact nutrient cycling in ecosystems."

Denitrification converts biologically available nitrogen, such as nitrate, into nitrogen gas, effectively removing excess nitrogenous nutrients from aquatic systems. In places like the Chesapeake Bay, where excess nitrogen can fuel harmful algal blooms and low-oxygen dead zones, the process is a key regulator of water quality and eutrophication.

In addition to nitrogen-cycling genes, researchers found genes responsible for the degradation of hydrocarbons and plastic-related compounds. They emphasized that their study does not prove that these processes are occurring, only that there is genetic potential for them.

"This is something that we should really be thinking about," said co-author Bongkeun Song, professor and chair of the Ecosystem Health Section at the Batten School & VIMS and Fortin's former...

Read More →

Paper mill waste could unlock cheaper clean energy

Science Daily · 29 May 2026

Researchers have developed a catalyst sourced from renewable plant waste that shows strong potential for speeding up clean hydrogen production. The material is produced by embedding nickel oxide and iron oxide nanoparticles into carbon fibers made from lignin, creating a structure that improves both efficiency and durability during the oxygen evolution reaction, a crucial part of water electrolysis.

The study, published in Biochar X , reports that the catalyst reaches a low overpotential of 250 mV at 10 mA cm^2 and remains highly stable for more than 50 hours when operating at elevated current density. These performance levels point to a viable, low cost alternative to the precious metal catalysts typically used in large-scale water splitting.

"Oxygen evolution is one of the biggest barriers to efficient hydrogen production," said corresponding author Yanlin Qin of the Guangdong University of Technology. "Our work shows that a catalyst made from lignin, a low-value byproduct of the paper and biorefinery industries, can deliver high activity and exceptional durability. This provides a greener and more economical route to large-scale hydrogen generation."

Transforming Lignin Into a Functional Carbon Framework

Lignin is one of the most abundant natural polymers, yet it is often burned for minimal energy return. In this work, the team converted lignin into carbon fibers using electrospinning and thermal treatment. These fibers serve as a conductive and supportive framework for the metal oxide particles. The resulting catalyst, known as NiO/Fe3O4@LCFs, contains nitrogen-doped carbon fibers that offer fast charge transport, high surface area, and strong structural stability.

Microscopy revealed that the nickel and iron oxides form a nanoscale heterojunction within the carbon fiber structure. This interface plays a central role in the oxygen evolution reaction by helping intermediate molecules bind and detach at optimal rates. Pairing these metal oxides with a conductive carbon network improves electron movement and prevents the particles from clumping together, which is a frequent issue in conventional base metal catalysts.

Verified Activity Through Advanced Testing

Electrochemical measurements showed that the material performs better than catalysts containing only one metal, especially under the high current conditions needed for real world electrolysis systems. The catalyst also exhibits a Tafel slope of 138 mV per decade, indicating more rapid reaction kinetics. Additional evidence from in situ Raman spectroscopy and density functional theory calculations supports the proposed mechanism, confirming that the engineered interface efficiently drives oxygen evolution.

Scalable Design Using Widely Available Biomass

"Our goal...

Read More →

Are Berries Safe To Eat? What You Need To Know About the Pesticide Dimethoate

Sci Tech Daily · 10 Mar 2026

Australia paused the use of a common berry pesticide after rising consumption increased potential exposure, especially for young children.

Australia's agricultural regulator has temporarily halted the use of a widely used pesticide called dimethoate on blueberries, raspberries, and blackberries.

The one-year suspension is not based on new evidence about the chemical itself. Instead, the Australian Pesticides and Veterinary Medicines Authority (APVMA) says the decision reflects changes in how much fruit people are eating . As berry consumption has increased, the potential for dietary exposure to the pesticide has also risen.

According to the agency, young children between the ages of two and six may now face a higher chance of exceeding recommended exposure limits.

Here is what is currently known about dimethoate and whether it remains safe to include berries in your diet.

Dimethoate is a pesticide that has been used in Australia since 1956. It belongs to a class of pesticides that inhibit the enzyme acetylcholinesterase . This prevents the breakdown of a key neurotransmitter (chemical messenger) and so paralyzes an insect's nervous system , killing it.

Mammals, including humans, also have the enzyme acetylcholinesterase, and can be poisoned by this class of pesticide.

So careful regulation of both the application of dimethoate and levels of dimethoate residues on food are required so we are not exposed to harmful levels.

The amount of maximum permissible residues depends, in turn, on how much someone is exposed to from their food.

To do this, you need to have estimates of how much residue is on food and how much food we eat.

The APVMA has a maximum limit for how much dimethoate we should be exposed to from our food. This is known as the acute reference dose (or ARfD), which is 0.02 milligrams per kilogram of body weight .

This maximum dose includes a safety factor of ten. In other words, the maximum dose allowed is ten times lower than the lowest dose that has no effect.

This dose was set in 2017. But it is consistent with current World Health Organization limits and Canadian regulations . Australia's maximum dose is lower than limits from the United States Environmental Protection Agency.

But our dietary habits have changed. Australian consumption of blueberries, blackberries, and raspberries has increased substantially since the APVMA last assessed dimethoate. Consumption is up 285–962% compared to levels considered for its 2017 assessment.

Eating more berries is a...

Read More →

New wood-based resin beats fossil resin strength by 76%

New Atlas · 8 Mar 2026

To wood or not to wood, that's been the question! Ever since oil-based plastics burst onto the manufacturing scene, cost, sustainability, and performance have defined the ongoing woods vs. plastics war. In many applications, plastics tend to dominate in cost efficiency and durability, while wood retains a clear edge in sustainability.

Researchers at the University of Oulu, Finland, may be tipping that balance in wood's favor – at least in certain applications. The researchers have invented wood-derived alternatives to two of industry's most widely used resins: polyester and epoxy.

High-performance composite materials are indispensable in the marine, renewable energy, sports, transportation, and construction industries, where material durability and performance are critical. Polyester resins are everywhere, forming the matrix in glass-fiber composites used in everything from boat hulls and automotive body panels to roofing sheets and sanitary fixtures. Epoxy resins, meanwhile, serve as structural adhesives and protective coatings, and act as the primary matrix in carbon fiber components for wind turbine blades, aircraft structures, high-end sporting goods, and civil engineering reinforcements.

However, these materials come with significant sustainability challenges. Both polyester and epoxy resins are primarily derived from fossil fuels, making them energy-intensive and carbon-heavy to produce. The composites they form are also notoriously difficult to recycle. The cured resins form tightly cross-linked networks that cannot simply be melted down. Plus, separating them from embedded glass or carbon fibers is like taking candy from a dragon. Recycling is possible, but it usually involves specialized, expensive processes that only some facilities can handle at scale.

In an effort to address the dilemma of performance vs. sustainability, the researchers have developed bio-based resins that not only address sustainability concerns but also deliver on performance.

The science magic behind these materials is as follows. Conventional epoxy resin, widely used in high-performance composites, is made from diglycidyl ether of bisphenol A (DGEBA), a petroleum-derived resin. In the new materials, the researchers replace this fossil-based backbone with furfural-derived diepoxides produced from agricultural and wood residues, thereby creating a plant-based epoxy system that can be cured. The researchers produced the essential building block, furfural, from lignocellulosic biomass.

The results are resins that are not only sustainable but also outperform their fossil-based counterparts! During testing, the glass fiber-reinforced composites with a variant of the plant-based resin exhibited improved toughness and significantly higher tensile and flexural strengths and toughness than DGEBA resins. These results represent a big win for...

Read More →

New iron nanomaterial wipes out cancer cells without harming healthy tissue

Science Daily · 20 Jun 2026

Researchers at Oregon State University have created a new nanomaterial designed to destroy cancer cells from the inside. The material activates two separate chemical reactions once inside a tumor cell, overwhelming it with oxidative stress while leaving surrounding healthy tissue unharmed.

The work, led by Oleh Taratula, Olena Taratula, and Chao Wang from the OSU College of Pharmacy, was published in Advanced Functional Materials .

The discovery strengthens the growing field of chemodynamic therapy or CDT. This emerging cancer treatment strategy takes advantage of the unique chemical conditions found inside tumors. Compared with normal tissue, cancer cells tend to be more acidic and contain higher levels of hydrogen peroxide.

Traditional CDT uses these tumor conditions to spark the formation of hydroxyl radicals, highly reactive molecules made of oxygen and hydrogen that contain an unpaired electron. These reactive oxygen species damage cells through oxidation, stripping electrons from essential components such as lipids, proteins, and DNA.

More recent CDT approaches have also succeeded in generating singlet oxygen inside tumors. Singlet oxygen is another reactive oxygen species, named for its single electron spin state rather than the three spin states seen in the more stable oxygen molecules present in the air.

"However, existing CDT agents are limited," Oleh Taratula said. "They efficiently generate either radical hydroxyls or singlet oxygen but not both, and they often lack sufficient catalytic activity to sustain robust reactive oxygen species production. Consequently, preclinical studies often only show partial tumor regression and not a durable therapeutic benefit."

To address these shortcomings, the team developed a new CDT nanoagent built from an iron-based metal-organic framework or MOF. This structure is capable of producing both hydroxyl radicals and singlet oxygen, increasing its cancer-fighting potential. The MOF demonstrated strong toxicity across multiple cancer cell lines while causing minimal harm to noncancerous cells.

"When we systemically administered our nanoagent in mice bearing human breast cancer cells, it efficiently accumulated in tumors, robustly generated reactive oxygen species and completely eradicated the cancer without adverse effects," Olena Taratula said. "We saw total tumor regression and long-term prevention of recurrence, all without seeing any systemic toxicity."

In these preclinical experiments, tumors disappeared entirely and did not return, and the animals showed no signs of harmful side effects.

Next Steps Toward Broader Cancer Treatment

Before moving into human trials, the researchers plan to test the treatment in additional cancer types, including aggressive pancreatic cancer, to determine whether...

Read More →

New catalyst makes plastic upcycling 10x more efficient than platinum

Science Daily · 14 Nov 2026

Many common products, including plastics and detergents, rely on chemical reactions that depend on catalysts made from precious metals such as platinum. These metals are effective but costly and limited in supply. For years, scientists have been searching for alternatives that are cheaper and more sustainable. One promising option is tungsten carbide, an Earth-abundant material already widely used in industrial machinery, cutting tools, and chisels.

Despite its potential, tungsten carbide has not been easy to use as a catalyst. Its chemical behavior can be unpredictable, which has restricted its broader adoption. Researchers led by Marc Porosoff, an associate professor in the University of Rochester's Department of Chemical and Sustainability Engineering, have now made important progress that could allow tungsten carbide to compete with platinum in key chemical reactions.

According to Sinhara Perera, a chemical engineering PhD student in Porosoff's lab, one of the main challenges lies in how tungsten carbide atoms arrange themselves.

Tungsten carbide's atoms can form many different configurations, known as phases, says Perera. These phases can strongly influence how well the material performs as a catalyst.

"There's been no clear understanding of the surface structure of tungsten carbide because it's really difficult to measure the catalytic surface inside the chambers where these chemical reactions take place," she says.

To address this problem, the research team designed a method to precisely control the structure of tungsten carbide during active reactions. In a study published in ACS Catalysis , Porosoff, Perera, and chemical engineering undergraduate student Eva Ciuffetelli '27 manipulated tungsten carbide particles at the nanoscale inside chemical reactors that operate at temperatures above 700 degrees Celsius.

Using a technique called temperature-programmed carburization, the researchers created tungsten carbide catalysts in specific phases directly inside the reactor. They then ran chemical reactions and analyzed which versions delivered the strongest performance.

"Some of the phases are more thermodynamically stable, so that's where the catalyst inherently wants to end up," says Porosoff. "But other phases that are less thermodynamically stable are more effective as catalysts."

The team identified one phase in particular, β-W2C, that showed exceptional performance in reactions that convert carbon dioxide into key building blocks for fuels and useful chemicals. With additional optimization by industry, the researchers believe this form of tungsten carbide could match platinum's effectiveness without its high price or supply limitations.

Beyond carbon dioxide conversion, Porosoff and his collaborators have also explored tungsten carbide as a catalyst...

Read More →

Quantum tunnelling harnessed to radically improve efficiency of separation of deuterium from water

Chemistry World · 6 Mar 2026

Deuterium can be electrochemically separated from ordinary hydrogen far more efficiently than current techniques using a ‘through barrier’ effect. The work, which achieves a record-breaking separation factor at room temperature, could be useful to the nuclear industry.

Conventional deuterium separation compared with the new ‘through barrier’ method

Deuterated water has many uses, ranging from a coolant in nuclear reactors to a drug for Huntington’s disease. However, it naturally makes up only about 120 parts per million of water and

separating it from water containing light hydrogen (protium) is difficult. Owing to the mass difference, researchers have developed distillation and selective adsorption technologies, but these are both energy intensive.

A lower-energy alternative is electrochemical separation of an aqueous solution to discharge hydrogen at the cathode. ‘The lighter isotopes have a lower energy barrier for different reactions,’ explains electrochemist Magda Barecka at Northeastern University in Boston, Massachusetts. ‘In an electrochemical cell there would be multiple ways in which light water is reacted and therefore heavy water is enriched.’ Unfortunately, any chemical process that reduces the activation energy for cleavage of the bond between oxygen and protium also reduces the activation energy of oxygen–deuterium cleavage.

In the new work, the researchers took an alternative tack, focusing not on lowering the energy of bonds but raising them. Simulations suggested that adding isopropanol to an alkaline electrolyte reconfigured the hydrogen-bond network around the active sites in a ruthenium–nickel carbide electrode, making it more ordered and shortening the water’s bond lengths. When a potential difference was applied to the solution, the traditional chemical mechanism involving electron transfer to a loosely-bound proton was suppressed. However, protium – being much lighter than deuterium – has a more delocalised wavefunction. It therefore has a much greater probability of tunnelling through an energy barrier that it is classically forbidden from penetrating, and shortening the bond length makes this more likely.

The researchers found that their techniques’ ‘H 2 O separation factor’ (the ability to select for one type of water over the other) was more than twice as high as that of the best chemical sieving membranes. They designed a five-stage reactor and found that, at room temperature and a potential of just 0.4V, they could start with water and continuously enrich it to a deuterium atomic fraction of 80%. The process was even more selective at low temperatures, but its effectiveness at room temperature made this cooling uneconomic. ‘Subsequent...

Read More →

Unconventional catalyst support promotes record green methanol synthesis from carbon dioxide

Chemistry World · 9 Mar 2026

The synthesis of methanol from carbon dioxide can be dramatically improved by switching the catalyst support from zirconia to hafnia. Hafnia’s monoclinic crystal structure and insulating electronic properties efficiently stabilise single atoms of the active indium catalyst, boosting activity by up to 70% and substantially reducing the required loading of this expensive metal. These findings demonstrate the importance of carrier engineering and open the door to an alternative approach to catalyst design, say the authors.

Growing indium oxide on a hafnium oxide support led to a much better catalyst

Green methanol, produced via the hydrogenation of carbon dioxide, is an important step in the decarbonisation of chemical and fuel production. Current commercial catalysts are based on copper and zinc, but deliver modest selectivity and often suffer irreversible deactivation by water. Over the last 10 years, indium oxides have emerged as a promising alternative, in particular when embedded on a monoclinic zirconia support. Various hypotheses have sought to explain the origin of this

promotional effect, but the precise mechanism has remained elusive, hampering efforts to reproduce or improve upon this activity.

Other crystal structures of zirconium oxide produce a much smaller boost in catalytic activity and Javier Pérez-Ramírez and Sharon Mitchell at ETH Zurich therefore proposed that it was specifically the monoclinic form which boosted catalytic performance. However, a quick search of the materials database revealed only one accessible analogue: hafnia. Although typically considered catalytically inert, hafnia shares many properties with zirconia – notably, a wide band gap and high dielectric constant – which Pérez-Ramírez and Mitchell suspected would be crucial to the oxides' auxiliary catalytic effect.

The team prepared a series of nanostructured indium–hafnium oxide catalysts, comparing their hydrogenation performance against the zirconia benchmark. The alternative support outperformed this standard across the board with the most significant improvement – a 70% boost in indium utilisation – achieved for single-atom catalyst loading.

These findings supported the initial hypothesis that the monoclinic structure and corresponding electronic properties were responsible for the observed activity enhancement and the team next performed a series of computational analyses to corroborate this theory further.

Their analysis suggests the monoclinic structure promotes the formation of oxygen vacancies around the indium centre, providing an accessible pocket in which the reaction can occur. The oxides' insulating properties also help ensure the reaction remains localised around these active sites. 'Materials with a wide band gap do not transfer electrons, so they...

Read More →

Engineers Create Unusual Magnetic Material That Behaves Like Graphene

Sci Tech Daily · 10 Mar 2026

Researchers at the University of Illinois have discovered a surprising mathematical connection between two areas of condensed-matter physics that were long considered separate.

The electronic and magnetic behavior of two-dimensional materials both hold significant promise for future technologies. For many years, scientists treated these two properties as unrelated. Engineers at the University of Illinois Grainger College of Engineering have now shown that they can be described using the same mathematical framework.

In a study published in Physical Review X , researchers at the University of Illinois Urbana-Champaign demonstrated how carefully designed two-dimensional magnetic systems can follow the same equations that govern mobile electrons in graphene . This connection could influence the development of radiofrequency technologies and offer scientists a new strategy for analyzing and designing these types of materials.

"It's not at all obvious that there is an analogy between 2D electronics and 2D magnetic behaviors, and we're still amazed at how well this analogy works," said Bobby Kaman, the study's lead author. "2D electronics are very well studied thanks to the discovery of graphene, and now we've shown that a not-so-well-studied class of materials obeys the same fundamental physics."

The concept originated while Kaman, a materials science and engineering graduate student in the research group of professor Axel Hoffmann, was studying metamaterials . These materials are

designed with carefully arranged internal structures that produce behaviors not possible in the original substance's atomic-scale form.

Electrons moving through graphene and tiny magnetic disturbances in so-called magnonic materials can both behave like waves. This similarity led Kaman to wonder whether a magnonic material could be engineered to mimic the electronic behavior seen in graphene.

"Graphene is unique because its conduction electrons organize into massless waves, so I was curious if altering the physical geometry of a magnonic material to look like graphene would make it act like graphene," Kaman said. "I thought it would maybe have a handful of similar properties to graphene, but the analogy was much deeper and richer than I expected."

To test this idea, the team examined a system in which microscopic magnetic moments, known as "spins," are arranged within a thin film. The surface of the film contains holes placed in a hexagonal pattern that resembles graphene's structure.

When the researchers calculated the energies of disturbances moving through the material, called spin waves, they discovered that these waves follow the same mathematical rules that describe electrons traveling...

Read More →

CURIOSITIES

Bio-inspired robo-dolphin could soon be vacuuming oil off the sea's surface

New Atlas · 10 Mar 2026

When it comes to systems for cleaning up marine oil spills, most of them simply float in place, waiting for the oil to come to them. A new robot, however, could proactively move through oil slicks – and it's inspired by both a dolphin and a sea urchin.

Known as the Electronic Dolphin, the experimental device is being developed by scientists at Australia's RMIT University. Designed to move across the surface of the water, it's about the size of a sneaker in its current small-scale form, and it utilizes a unique filtering system inspired by the one used by sea urchins.

As the Electronic Dolphin moves through an oil slick, an onboard pump draws the oily water into the filter, which is essentially a sponge with a "special coating" of microscopic spikes (namely oleic acid-functionalized barium carbonate with reduced graphene oxide nanosheets). Those spikes hold tiny pockets of air that cause water to roll off the filter, while still allowing oil to stick to it.

As a result, the filter absorbs only oil, without becoming saturated with water. And once the material is full of oil, it can be discharged and reused multiple times. The discharged oil is stored in an onboard chamber.

In lab trials performed so far, the Wi-Fi-controlled robot was able to recover oil from water at a rate of about 2 milliliters per minute with more than 95% purity, running for approximately 15 minutes per battery-charge. Plans call for the final product to be scaled up considerably, however.

"We envision the robot to be approximately the size of a dolphin," lead scientist Dr. Ataur Rahman tells us. "The final dimensions will depend on the capacity of the pump and the onboard container used to store the recovered oil."

"It will operate as a fully autonomous, standalone system. The robot will vacuum oil from the water’s surface, return to its base station to discharge the collected oil, and then redeploy to the spill site. This cycle can be repeated as many times as necessary until the affected area is fully cleaned."

A paper on the research was recently published in the journal Small .

Read More →

Uncovering the hidden bacteria often mistaken for cholera

Phys Org · 11 Mar 2026

Scientists have created a genomic blueprint for Aeromonas bacteria, which can cause antibiotic-resistant diarrheal disease—with symptoms often misidentified as cholera—in humans and animals.

This international collaboration, including scientists at the Wellcome Sanger Institute, icddr,b (International Center for Diarrheal Disease Research, Bangladesh), and the Post Graduate Institute of Medical Education & Research (PGIMER), India, sequenced nearly 1,000 Aeromonas bacterial genomes from Bangladesh and India. They revealed these bacteria are a source of environmental antimicrobial resistance that could transfer to other disease-causing bacteria, including resistance to last resort antibiotics.

The study, published earlier this year in Nature Communications , found that there is no clear difference between the Aeromonas bacterial strains found in the clinic infecting humans and those found in the environment. This suggests that all circulating strains have the ability to cause disease in humans by spilling over from well-known reservoirs such as farmed fish species, including trout and catfish.

Creating the first genomic blueprint for Aeromonas could help develop a rapid test for use in the clinic to help ensure that infections are identified correctly. Currently, Aeromonas infections are often misidentified as cholera due to the similarities in symptoms and can look alike on the current tests. However, treatment differs between the two: Cholera is usually managed with oral rehydration solutions, while Aeromonas infections may require antibiotics.

Therefore, being able to identify which approach is needed is crucial. Additionally, some strains of Aeromonas bacteria are resistant to multiple types of antibiotics, impacting which treatments will be effective. Misidentification also impacts public health efforts to control and minimize cholera outbreaks.

Aeromonas are a group of bacteria consisting of over 30 different species, several of which are known to cause disease in humans and aquatic animals, such as fish. In humans, these bacteria are capable of causing diarrheal disease outbreaks and can cause sepsis in certain populations, such as those with underlying health conditions. The bacteria can be found in water and food, and are common in children under five years old in countries such as Bangladesh and India.

In fish, Aeromonas infection can cause high mortality, causing significant economic impact to aquaculture when an outbreak happens in fish farming. Additionally, infections in fish can jump to humans through contact with infected animals or water, especially via open wounds.

To gain a full picture of the Aeromonas species circulating in South Asia, this team analyzed 1,853 bacterial genomes, including 996 newly...

Read More →

First half-Möbius molecule made

Chemistry World · 9 Mar 2026

Twisted structure is an unprecedented case of a compound that becomes aromatic by breaking its own symmetry

Chemists have created the first-ever half-Möbius molecule. The orbitals of the 13-carbon ring twist by only a quarter turn with each circumnavigation rather than the half-twist of regular Möbius aromatics. It’s also the first example of a molecule that becomes more aromatic as it becomes less symmetric.

A team led by Igor Rončević from the University of Manchester, UK, and Leo Gross from IBM in Zurich, Switzerland, first spotted the curious structure – C 13 Cl 2 – in 2024, as an intermediate in their synthesis of cyclo[13]carbon . They were zapping individual molecules of a tricyclic, fully chlorinated precursor with the tip of a scanning tunnelling microscope (STM) to remove the chlorine atoms.

The molecule's electronic structure was probed using quantum computing hardware

'We noticed [this intermediate] was chiral – that was the first excitement,' recalls Harry Anderson from the University of Oxford, UK. 'You can apply voltage pulses to switch it between enantiomers. That fascinated us and we realised that the orbitals have this strange half-Möbius topology.'

The aromatic π-orbitals in Möbius molecules have a 180º twist for every loop around the ring while the orbitals in the new half-Möbius molecule twist only by 90º – meaning they need to wind around the ring four times to return to the start. This is because they have a +-shaped cross-section, unlike the linear orbital cross-section in a regular Möbius ring.

'It's not often that you get to read a paper that introduces truly new concepts and this is very much one of them,' comments Henry Rzepa from Imperial College London, UK, an expert on Möbius aromatics who wasn't involved in the project. '[It's] a remarkable achievement across a number of dimensions: organic chemistry, surface science, nanoscience and quantum chemistry,' adds theoretical chemistry expert Gemma Solomon from Denmark's University of Copenhagen.

The C 13 Cl 2 molecule also has a planar, weakly anti-aromatic form that is less stable than the two buckled, half-Möbius enantiomers. 'As it breaks its symmetry, it becomes aromatic,' Rončević explains. 'This has never been observed to my knowledge. Usually, as we distort something it becomes less aromatic or less anti-aromatic.'

The orbitals of the 13-carbon ring have a 'strange half-Möbius topology'

'It's a horribly complicated problem in terms of electronic structure,' Rončević adds. 'The workhorse of modern computational chemistry,...

Read More →

Young cancer survivors face faster aging and possible early dementia

Science Daily · 10 Jan 2026

Teens and young adults who survive cancer appear to age more quickly than people their same age who have never had the disease, according to new research. Scientists found signs of faster aging not only inside cells but also in brain performance, including memory, attention, and the ability to process information.

The findings were published in Nature Communications . The research was led by AnnaLynn Williams, PhD, of the University of Rochester Wilmot Cancer Institute, along with co-corresponding author Kevin Krull, PhD, of St. Jude Children's Research Hospital.

Lifestyle Changes May Help Reverse Biological Aging

There may be encouraging news ahead. Ongoing work at Wilmot suggests that some of the accelerated aging seen in young survivors could potentially be slowed or even reversed through healthy habits such as quitting smoking, exercising regularly, and improving diet, Williams said.

"Young cancer survivors have many more decades of life to live," she said. "So, if these accelerated aging changes are occurring early on and setting them on a different trajectory, the goal is to intervene to not only increase their lifespan but improve their quality of life."

Many survivors treated in childhood or young adulthood are working toward finishing school, launching careers, gaining independence, or starting families. Cognitive challenges can make those milestones harder to reach.

"It's kind of like a perfect storm," Williams said. "This is why we see many survivors having worse educational and employment outcomes than their siblings."

Williams, who is also a cancer survivor, serves as an assistant professor in the Department of Surgery and is part of Wilmot's Cancer Prevention and Control research program, which focuses on reducing long-term symptoms in survivors.

The study included about 1,400 participants treated at St. Jude. All were at least five years beyond their cancer therapy, and some had survived for decades. Most had been treated for acute lymphoblastic leukemia (ALL) or Hodgkin lymphoma.

Researchers found evidence of faster biological aging regardless of the type of treatment received during childhood. However, chemotherapy was linked to the greatest acceleration. Because chemotherapy can alter DNA structure and cause widespread cellular damage, it appears to have the strongest effect on the aging process.

The investigators also identified a close connection between cellular aging and cognitive performance. Survivors whose biological age was higher than their actual chronological age had more difficulty with memory and attention.

For individuals who received radiation directly to the brain, Williams said...

Read More →

Lamprey-inspired suction cup lifts 850 times its own weight

New Atlas · 11 Mar 2026

Lampreys are able to stay securely attached to whales and sharks as they hurtle through the ocean, so you'd think they could teach us a thing or two about suction. It turns out that they can indeed, as scientists have developed a lamprey-inspired suction cup that can lift over 800 times its own weight.

Lampreys achieve suction via an "oral disc" consisting of a soft lip around the outside, and a ring of teeth on the inside. The teeth dig into the nooks and crannies of the host animal's skin, while the lip forms an airtight, watertight seal.

Peking University's Prof. Junzhi Yu and colleagues have replicated that mechanism in a device inspired by the oral disc of the Far Eastern brook lamprey, a freshwater species found in China, Japan, Russia and other regions.

The disc-shaped gadget features a soft silicone outer lip, at the center of which is a round core composed of a temperature-controlled Shape Memory Polymer (SMP).

When the device is pressed onto a surface, the silicone lip immediately forms a seal, just like a regular suction cup. A heater directly behind the core then warms it to a temperature of 33 ºC (91

ºF), causing the SMP to become soft and rubbery. This allows it to get sucked right into all the microscopic crevices and pores of the surface, by the vacuum created by the seal.

When the heater is subsequently switched off, the SMP hardens into that same "locked in" configuration. It stays that way until it's heated again, and will maintain a secure grip even if the silicone lip's seal is broken.

In lab tests, the 70-gram (2.5-oz) suction cup was able to generate enough pull-off force to lift objects weighing over 850 times its own weight, both in the air and underwater. And unlike a traditional suction cup, it had no problem adhering to rough, porous, or irregularly shaped objects – it lifted everything from a desk to a wrench to a brick to a conch shell.

"The application scenarios for this technology are vast," say the scientists. "We envision this technology being deeply integrated into various robotic platforms, playing a crucial role in deep-sea resource exploration, marine engineering maintenance, and amphibious emergency rescue operations."

A paper on the research was recently published in the journal Cyborg and Bionic Systems .

Read More →

This 550-Million-Year-Old Creature May Already Have Had a Brain

Sci Tech Daily · 11 Mar 2026

Scientists have uncovered surprising complexity in a tiny sensory structure found in comb jellies, some of the oldest animals on Earth.

New three-dimensional reconstructions of an important sensory organ in comb jellies reveal a level of structural and functional complexity that scientists did not expect. The results suggest that a simple brain-like system may have already existed in some of Earth’s earliest animals, offering new insight into how nervous systems evolved.

Ctenophores, commonly called comb jellies, are gelatinous marine animals that first appeared in the oceans about 550 million years ago. These delicate creatures possess a specialized sensory structure known as the aboral organ (AO). This organ helps them detect gravity, pressure, and light.

A new morphological study published in Science Advances shows that this structure is far more sophisticated than researchers previously realized.

“We show that the AO is a complex and functionally unique sensory system,” said Pawel Burkhardt, group leader at the Michael Sars Centre, University of Bergen. “Our study profoundly enhances our understanding of the evolution of behavioral coordination in animals.”

To investigate how the aboral organ is organized internally, the researchers worked with collaborator Maike Kittelmann at Oxford Brookes University. The team used advanced volume electron microscopy to examine the structure in remarkable detail.

By analyzing high-resolution, three-dimensional reconstructions of the AO, the scientists identified 17 different cell types. Among these were 11 secretory and ciliated cell types that had not been described before. This impressive cellular variety confirms that the aboral organ functions as a complex, multimodal sensory system.

“I was amazed almost immediately by the morphological diversity of the aboral organ cells. Working with volume EM data feels like discovering new exciting things every day”, said Anna Ferraioli, a postdoctoral researcher at the Michael Sars Centre and first author of the study. “The AO has a striking complexity when compared to apical organs of cnidarian and bilaterian. It is so unique!”

The researchers also found that the aboral organ is closely connected to the comb jelly’s nervous system, which consists of a continuous network of fused neurons. This neural network forms direct synaptic connections with cells in the aboral organ, creating a clear route for two-way communication.

Many of the cells in the AO also contain large numbers of vesicles. These structures suggest that the cells release chemical signals that spread through surrounding tissue in a process known as volume transmission. Together, the observations...

Read More →

This 2-pound dinosaur is rewriting what scientists know about evolution

Science Daily · 3 Feb 2026

Researchers have identified a 90 million year old fossil that helps solve a long standing mystery about a strange group of prehistoric animals. The discovery was led by University of Minnesota Twin Cities scientist Peter Makovicky along with Argentine paleontologist Sebastian Apesteguía.

Their findings, published in the peer reviewed journal Nature, describe a nearly complete skeleton of Alnashetri cerropoliciensis . This dinosaur belonged to a peculiar group of bird like theropods called alvarezsaurs. These animals are known for their tiny teeth and unusually short arms that end in a single enlarged thumb claw.

For decades, scientists struggled to understand this group because most well preserved fossils had been discovered in Asia. Fossils from South America were often incomplete, leaving major gaps in the evolutionary story.

Patagonia Discovery Provides a Crucial Specimen

The almost complete Alnashetri fossil was uncovered in 2014 in northern Patagonia, Argentina, at a fossil rich site famous for exceptionally preserved Cretaceous animals. The species had originally been named several years earlier based on fragmentary remains, but the new skeleton provided a far clearer view of the animal's unusual body structure.

Preparing the specimen was a slow and careful process. Over the past decade, researchers meticulously cleaned and assembled the delicate bones to prevent damage to the small and fragile skeleton.

"Going from fragmentary skeletons that are hard to interpret, to having a near complete and articulated animal is like finding a paleontological Rosetta Stone," said Peter Makovicky, lead author of the study and a professor in the University of Minnesota Department of Earth and Environmental Sciences. "We now have a reference point that allows us to accurately identify more scrappy finds and map out evolutionary transitions in anatomy and body size."

The fossil is providing scientists with valuable insight into how this lineage of dinosaurs evolved, became smaller, and spread across ancient continents.

Insights Into the Evolution of Tiny Dinosaurs

The skeleton reveals that Alnashetri differed from its later relatives in several ways. It had longer arms and larger teeth, showing that some alvarezsaurs had already evolved very small body sizes before developing the specialized features that later species used for what scientists believe was an "ant-eating" diet.

Microscopic examination of the bones also showed that the animal was fully grown and at least four years old. These dinosaurs rank among the smallest known non avian dinosaurs, and they remained small throughout their lives. Even the largest...

Read More →

What snow monkeys' steamy baths are really doing to their bodies

Science Daily · 12 Jun 2026

Japanese macaques, better known as snow monkeys, are famous for sitting in steaming hot springs when temperatures drop. While the warm water clearly helps them cope with winter cold, researchers at Kyoto University found that these baths do more than provide heat.

"Hot spring bathing is one of the most unusual behaviors seen in nonhuman primates," says first author Abdullah Langgeng. His team wondered whether regularly soaking in hot springs might also influence the parasites and microscopic organisms that live on and inside the monkeys.

Studying Parasites and the Gut Microbiome

To find out, the researchers traveled to Jigokudani Snow Monkey Park in Nagano prefecture. Over the course of two winters, they tracked a group of female macaques, comparing those that frequently bathed in hot springs with those that rarely or never did. The scientists combined direct behavioral observations with parasite checks and gut microbiome sequencing. Their goal was to determine whether bathing affects the macaque holobiont, the combined biological system made up of the animal and the microbes and parasites associated with it.

The findings showed that time spent in hot springs subtly changes how the monkeys interact with parasites and gut microbes. Monkeys that soaked in the warm water had different patterns of lice on their bodies and differences in certain gut bacteria. This suggests that immersion in hot water may interfere with lice activity or where they lay their eggs.

Subtle Microbial Shifts Without Higher Infection Risk

The researchers also detected modest differences in the gut microbiome. Overall diversity of gut bacteria was similar between monkeys that bathed and those that did not. However, several bacterial genera were more common in individuals that skipped the hot springs. Importantly, sharing the pools did not appear to raise the risk of intestinal parasites. Bathing macaques showed no increase in parasite infection rates or severity.

Taken together, the results show that behavior can influence the animal holobiont and play a meaningful role in health. The study highlights how complex the relationship between behavior and health can be in wild animals. Bathing changed some interactions between the monkeys and the organisms that live with them, while leaving others unaffected.

"Behavior is often treated as a response to the environment," says Langgeng, "but our results show that this behavior doesn't just affect thermoregulation or stress: it also alters how macaques interact with parasites and microbes that live on and inside them."

What...

Read More →

Strange Form of Superconductivity “Stuns” Scientists

Sci Tech Daily · 11 Mar 2026

A newly mapped form of superconductivity in uranium ditelluride emerges only under extremely strong magnetic fields, defying long-held expectations about how superconductors behave.

A puzzling form of superconductivity that arises only under strong magnetic fields has been mapped and explained by a research team that includes Andriy Nevidomskyy, professor of physics and astronomy at Rice University . Their findings, published in Science , describe how uranium ditelluride (UTe_2) develops a superconducting halo when exposed to intense magnetic fields.

Traditionally, scientists have viewed magnetic fields as harmful to superconductors. Even moderate magnetic fields typically weaken superconductivity, while stronger ones can destroy it once a known critical threshold is exceeded.

However, UTe_2 challenged these expectations. In 2019, researchers discovered that the material could maintain superconductivity in magnetic fields hundreds of times stronger than those tolerated by conventional superconductors.

“When I first saw the experimental data, I was stunned,” said Nevidomskyy, a member of the Rice Advanced Materials Institute and the Rice Center for Quantum Materials. “The superconductivity was first suppressed by the magnetic field as expected but then reemerged in higher fields and only for what appeared to be a narrow field direction. There was no immediate explanation for this puzzling behavior.”

The phenomenon was first identified by researchers at the University of Maryland (UMD) and the National Institute of Standards and Technology (NIST) and quickly drew global attention from physicists. In UTe_2, superconductivity disappears below 10 tesla—a magnetic field already considered extremely strong by conventional standards.

Unexpectedly, superconductivity reappears once the field strength exceeds about 40 tesla.

This surprising revival has been dubbed the Lazarus phase. Researchers determined that the phase depends critically on the angle of the magnetic field relative to the crystal’s structure.

Working with experimental collaborators at UMD and NIST, Nevidomskyy helped map the angular dependence of this high-field superconducting state. Their measurements revealed that the superconducting phase forms a toroidal, or doughnut-shaped, halo surrounding a specific crystalline axis.

“Our measurements revealed a three-dimensional superconducting halo that wraps around the hard b-axis of the crystal,” said Sylvia Lewin of NIST, a co-lead author on the study. “This was a surprising and beautiful result.”

To explain the observations, Nevidomskyy developed a theoretical model capable of reproducing the experimental results without relying heavily on debated microscopic mechanisms.

Instead, the approach used an effective phenomenological framework that required only a minimal set of assumptions about the pairing forces that bind electrons...

Read More →

A bold new plan could finally cure type 1 diabetes

Science Daily · 2 Aug 2026

At the Medical University of South Carolina (MUSC), researcher Leonardo Ferreira, Ph.D., is leading an ambitious effort to change how type 1 diabetes (T1D) is treated. Backed by $1 million from Breakthrough T1D, a leading global research and advocacy organization, Ferreira and collaborators at partner institutions are testing a new strategy aimed at treating and potentially curing the disease.

Their approach brings together stem cell science, immunology, and transplantation research. The central goal is straightforward but bold: restore insulin-producing beta cells in people with T1D without requiring immunosuppressive drugs.

"These awards support the most promising work that can significantly advance the path to cures for type 1 diabetes," said Ferreira. "This is what Breakthrough T1D believes is the next wave in type 1 diabetes therapy."

Engineering the Immune System to Protect Insulin Cells

Ferreira specializes in modifying the immune system using chimeric antigen receptors, or CARs. These engineered receptors help guide regulatory T cells, known as Tregs, to specific targets in the body. Tregs play an essential role in keeping immune responses under control and preventing excessive damage, including the autoimmune attack seen in T1D. In simple terms, they act like bodyguards, preventing the immune system from going too far and harming healthy tissue.

He is working alongside two prominent collaborators. Holger Russ, Ph.D., associate professor of Pharmacology and Therapeutics at the University of Florida, is a leader in stem cell research for T1D. Many scientists view this field as the future of transplantation because stem cells can provide a virtually unlimited supply of islet cells for research and clinical use. Michael Brehm, Ph.D., of the University of Massachusetts Medical School, completes the team. He is known for developing humanized mouse models that help researchers study human immune and metabolic responses in T1D.

Type 1 diabetes (T1D) is an autoimmune condition in which the immune system mistakenly attacks the pancreas's insulin-producing beta cells. Without these cells, the body cannot properly regulate blood sugar levels. People with T1D must closely monitor their glucose and rely on insulin injections to survive. According to the Centers for Disease Control and Prevention, about 1.5 million Americans live with the disease. Over time, it can lead to serious complications, including nerve damage, blindness, coma, and even death.

The new Breakthrough T1D award builds on a 2021 Discovery Pilot grant from the South Carolina Clinical & Translational Research Institute (SCTR), which first brought Ferreira and Russ...

Read More →

REACH UPDATE

Highlights from February BPC meeting

ECHA · 4 Mar 2026

ECHA/NR/26/13

ECHA's Biocidal Products Committee (BPC) adopted six opinions on active substances and two on Union authorisations.

Helsinki, 4 March 2026 – The BPC, in its February meeting, adopted the following opinions on active substances:

supporting the approval of ethanol for product-types 1 (human hygiene), 2 (disinfectants and algaecides not intended for direct application to humans or animals) and 4 (food and feed area);

not supporting the approval of DMDMH for product-types 6 (preservatives for products during storage) and 13 (working or cutting fluid preservatives); and

supporting the renewal of Hydrochloric acid for product-type 2.

The committee adopted the following two opinions supporting Union authorisations for:

biocidal product family containing C(M)IT/MIT (3:1) for the following product-types:

- 6 – preservatives for products during storage
- 11 – preservatives for liquid-cooling and processing systems
- 12 – slimicides; and

13 – working or cutting fluid preservatives.

biocidal product family containing Peracetic acid for product-type 3 (veterinary hygiene).

Read More →

ECHA's Risk Assessment Committee adopts its opinion on PFAS restriction proposal

ECHA · 3 Mar 2026

The European Chemicals Agency's (ECHA) Risk Assessment Committee (RAC) has concluded its evaluation of the universal restriction proposal on all per- and polyfluoroalkyl substances (PFAS). Its opinion is the first part of ECHA's two-committee scientific evaluation of the proposal.

Helsinki, 3 March 2026 – RAC has adopted its opinion drawing on an extensive and independent evaluation of PFAS hazards, volumes, emissions, risks and the likely effectiveness of a restriction as well as its practicality, including enforceability. Its evaluation is based on the proposal submitted in

January 2023 by the national authorities of the Netherlands, Germany, Denmark, Norway and Sweden, which covered all PFAS and all uses.

RAC is one of ECHA's two scientific committees responsible for evaluating EU-wide restriction proposals under the EU's chemicals regulation, REACH. RAC evaluates the risks to human health and the environment resulting from the manufacture, placing on the market and use of chemicals while the Socio-Economic Analysis Committee (SEAC) evaluates the socio-economic impacts of a restriction taking into account the availability of alternatives.

Next steps

The adopted RAC opinion will be published soon, providing full details of the opinion content.

SEAC is expected to agree its draft opinion next week. This draft opinion will be subject to a 60-day consultation. SEAC is expected to adopt its final opinion by the end of 2026. This adoption will conclude ECHA Committees' scientific evaluation of the proposed restriction and the opinions are formally submitted to the Commission.

The European Commission, based on the two opinions, will propose a restriction for discussion and vote in the REACH Committee, composed of EU Member States.

Background

The proposal to restrict PFAS in the EU/EEA was prepared by authorities in Denmark, Germany, the Netherlands, Norway and Sweden. It was submitted to ECHA on 13 January 2023. It aims to reduce PFAS emissions into the environment and make products and processes safer for people. The six-month consultation ran from 22 March to 25 September 2023.

PFAS are highly persistent chemicals that do not break down in the environment and can travel long distances through water and air. Once released in the environment, they tend to pollute groundwater and drinking water, which is difficult and costly to remediate. Certain PFAS accumulate in people, animals and plants and can cause toxic effect including cancer and harm to reproductive health.

Read More →

REGULATORY UPDATE

ASIA PACIFIC

Agvet chemical voluntary recall: Frequency Herbicide

APVMA · 24 Feb 2024

Product name: Frequency Herbicide

APVMA registration number: 86267

APVMA approved label number: 131170, 145930

Batch numbers: 224V110001, 224V120002, 224V120006, 224V120008, 244V020001, 244V020003, 244V020005, 244V020006, 244V020007, 244V020009, 244V020010, 244V020011, 244V020012, 244V020013, 244V020014, 244V020015, 254V020001, 254V020002, 254V020003, 254V020004, 254V020005, 254V020006, 25E9040001, 25E9040002, 25E9040003, 25E9040004, 25E9050001, 25E9050002

Sold by: agricultural retailers nationally between 1 June 2023 to 16 February 2026

On 16 February 2026, BASF Australia Ltd (ACN 008 437 867) initiated a voluntary recall under section 106 of the Agricultural and Veterinary Chemicals Code scheduled to the Agricultural and Veterinary Chemicals Code Act 1994 (Cth) in relation to the chemical product described above.

Reason for voluntary recall

A number of Frequency Herbicide batches do not meet BASF's quality requirements

Read More →

Model Code of Practice: Managing the risks of biological hazards at work

Safe Work Australia · 6 Mar 2026

The model Code of Practice: Managing the risks of biological hazards at work, the first Code of its kind in the world, provides practical guidance to assist employers with protecting workers and others from exposure to biological hazards in their workplace.

Biological hazards such as viruses, bacteria, parasites and certain types of fungi (like mould) can be found in all industries and workplaces. Exposure to biological hazards can result in injury, illness and disease.

Workers may be at risk of exposure if their work involves close contact with:

other people

animals

contaminated or organic materials, or

environments with vectors, such as mosquitoes, ticks or mites.

Exposure can occur when biological hazards are part of the work conducted (e.g. farmers handling sick animals), associated with the work environment (e.g. outdoor work in areas with mosquitoes), or brought into the workplace from the community (e.g. communicable diseases like the common cold).

Under work health and safety (WHS) laws, employers have a duty to manage the risks arising from biological hazards as much as possible. While the types of biological hazards and control measures that can be implemented vary by workplace, some baseline controls can significantly reduce risk, including:

maintaining a clean workplace with good air quality

training workers on hygiene practices, and

encouraging vaccination for vaccine preventable diseases

Read More →

New fact sheets on advisory notations in the workplace exposure limits (WEL) list

Safe Work Australia · 6 Jun 2026

On 1 December 2026, Australia's workplace exposure standards for airborne contaminants are changing to workplace exposure limits (WEL). In February, we published 6 fact sheets to help employers and WHS professionals understand advisory notations and new information notes in the WEL list.

See fact sheets

Read More →

Outcome of consultation

AICIS · 5 Mar 2026

Preview of upcoming changes to the

2026 categorisation guidelines

Thank you to everyone who provided feedback during the consultation. We've finalised planned changes to the AICIS Industrial Chemicals Categorisation Guidelines which will take effect in September 2026.

Key changes:

List of chemicals with high hazards for categorisation: 293 new entries and updates to 122 existing entries.

Addition of 5 chemicals to part 6.5.2 of the Guidelines: Information required to demonstrate the absence of developmental toxicity.

Revised definition of 'chemical identity holder'.

Read More →

AMERICA

Chemical Profile for Preservatives in Leave-On Products Comment Period Starts

DTSC · 23 Feb 2025

Comment Period for the Chemical Profile for Preservatives in Leave-On Products Comment Period Starts on February 23, 2026

The public comment period begins on February 23, 2026 and ends March 31, 2026.

DTSC invites you to review and comment on the draft for Preservatives in Leave-on Products profile. The draft profile documents the scientific basis for proposing to list these product-chemical combinations as potential Priority Products. We have been evaluating skin-applied leave-on products containing formaldehyde releasing preservatives or butylparaben for possible regulation under the Safer Consumer Products Regulations.

Comments can be made on the CalSAFER Website.

Read More →

EPA Requests Public Input On Charge Questions To e-Manifest Advisory Board And On Potential Topics For e-Manifest System Industry Users Conference

Bergeson & Campbell, P.C., 17-02-26 · 17 Feb 2026

On February 6, 2026, EPA invited the public to provide input for potential charge questions and/or charge question topics that EPA could consider when consulting the e-Manifest Advisory Board regarding the operations of EPA's e-Manifest. 91 Fed. Reg. 5473. According to EPA, relevant topics could include matters related to the operational activities, functions, policies, and regulations of EPA under the e-Manifest Act. EPA is also inviting the public to provide input on topics for an EPA sponsored e-Manifest Industry Users Conference. Advisory Board charge question and/or charge question topics recommendations and e-Manifest users conference topics recommendations comments are due March 9, 2026.

Read More →

Tensions rise as WV Senate passes bill to loosen regulation of storage tanks near drinking water

West Virginia Watch · 4 Mar 2026

The West Virginia Senate adopted a fast-tracked bill on Wednesday that would weaken oversight for aboveground storage tanks across the state that are used to hold liquids from industrial, mining, utility or energy operations, with many near drinking water sources.

Senate Bill 641 sped through the Senate this week before passing on Wednesday, which was the final day it could be adopted by the body due to the deadline requiring that most bills be passed from their chamber of origin. Despite being introduced on Jan. 28, the bill was first considered and passed by the Senate Committee on Energy, Industry and Mining Monday.

By Wednesday, it was on third reading and up for adoption in front of the full chamber.

Sen. Chris Rose, R-Monongalia, is the lead sponsor of the bill. He said on the floor Wednesday that lawmakers worked “in good faith” with the state Department of Environmental Protection and the oil and gas industry to craft the legislation. He did not mention any work done during bill drafting with water protection organizations or individuals who live in communities downstream from the tanks that would face fewer regulations if the law is enacted.

Read More →

PHMSA Proposes HMR Amendments To Harmonize With International Standards

Bergeson & Campbell, P.C., 17-02-26 · 17 Feb 2026

PHMSA proposed on February 10, 2026, to amend the HMR to adopt certain international regulations and standards related to proper shipping names, hazard classes, packing groups, special provisions, packaging authorizations, air transport quantity limitations, and vessel stowage requirements. 91 Fed. Reg. 5996. PHMSA states that these amendments are intended to maintain consistency with the latest international standards and regulations, and to reduce costs to entities or individuals within the United States or to otherwise lower the cost of regulations on the U.S. economy. Comments are due April 13, 2026. PHMSA states that to the extent possible, it will consider late-filed comments while developing a final rule.

Read More →

EPA Rescinds GHG Endangerment Finding And Motor Vehicle GHG Emission Standards Under The CAA

Bergeson & Campbell, P.C., 17-02-26 · 17 Feb 2026

EPA released a final rule on February 12, 2026, that will rescind the 2009 Greenhouse Gas (GHG) Endangerment Finding that served as a prerequisite for regulating emissions from new motor vehicles and new motor vehicle engines. EPA states that absent this finding, it lacks statutory authority under Section 202(a) of the Clean Air Act (CAA) to prescribe standards for GHG emissions. Therefore, EPA will also repeal all subsequent GHG emission standards from its regulations for light-, medium-, and heavy-duty on-highway vehicles and engines. According to EPA, “[t]his is the single largest deregulatory action in U.S. history and will save Americans over $1.3 trillion.” EPA notes that as a result of these changes, engine and vehicle manufacturers no longer have any future obligations for the measurement, control, and reporting of GHG emissions for any highway engine and vehicle, including model years manufactured prior to the final rule. The final rule is related only to GHG emissions and does not affect regulations on any traditional air pollutants. Rather, according to EPA, “this action realigns EPA’s regulatory framework with the best reading of the CAA, which does not authorize EPA to regulate GHG emissions from new motor vehicles.” The final rule will take effect 60 days after publication in the Federal Register.

Read More →

EUROPE

GB maximum residue levels (MRLs) amendment (adopted 17 January 2026)

UK HSE · 5 Mar 2026

Dinotefuran is not an approved active substance in GB and there are no PPP authorisations.

As notified in our previous ebulletin issued on 1 October 2025, it was proposed to lower the MRLs for dinotefuran in peaches, grapes and celeries to the limit of quantification of 0.01* mg/kg. HSE also proposed to adopt a number of MRLs for various commodities.

Following completion of the notification process to the World Trade Organization, new MRLs for dinotefuran were adopted on 17 January 2026.

To allow trading partners and food business operators time to adjust to the new lower MRLs, the date of entry into force of the new MRLs is 17 July 2026. The future MRLs can be reviewed in the decision document on the HSE website.

Read More →

HAZARD ALERT

Acrylic Acid

13 Mar 2026

Acrylic acid (IUPAC: prop-2-enoic acid) is an organic compound with the formula CH2=CHCO2H. It is the simplest unsaturated carboxylic acid, consisting of a vinyl group connected directly to a carboxylic acid terminus. This colourless liquid has a characteristic acrid or tart smell. [1] It is miscible with water, alcohol, ether, benzene, chloroform, and acetone. It polymerises readily in the presence of oxygen. Exothermic polymerisation at room temperature may cause acrylic acid to become explosive if confined. It is sensitive to heat and sunlight. It is also a fire hazard when exposed to heat or flame. Acrylic acid is incompatible with strong oxidisers, strong bases, strong alkalies and pure nitrogen. It may polymerise (sometimes explosively) on contact with amines, ammonia, oleum and chlorosulfonic acid, iron salts and peroxides. It may corrode iron and steel. [2]

Uses [2]

The primary use of acrylic acid is in the production of acrylic esters and resins, which are used primarily in coatings and adhesives. It is also used in oil treatment chemicals, detergent intermediates, water treatment chemicals, and water absorbent polyacrylic acid polymers. Acrylic acid is used widely for polymerisation, including production of polyacrylates. It is a monomer for polyacrylic and polymethacrylic acids and other acrylic polymers. It is used in the manufacture of plastics, as a tackifier, as a flocculant, in the production of water-soluble resins and salts, as a comonomer in acrylic emulsion and solution polymers and in moulding powder for signs, construction units, decorative emblems and insignias. It is used in polymer solutions for coatings applications, in paint formulations, in leather finishings, in paper coatings, in polishes and adhesives and in general finishes and binders.

Sources of Emission & Routes of Exposure [2,3]

Sources of Emission

- Industry sources: Acrylic acid may be released in wastewater and as emissions during its production and use. Acrylic acid is emitted from the production of acrylic acid and acrylate. The primary stationary sources listed in the US are manufacturers of guided missiles and space vehicles, and electronic components and accessories.
- Diffuse sources: Acrylic acid emissions can occur from polishes, paints, coatings, rug backings, adhesives, plastics, textiles, and paper finishes. Acrylic acid has been used as a pesticide.
- Natural sources: Acrylic acid is also produced naturally by some species of algae and has been found in the rumen fluid of sheep.

- Consumer products: Products containing acrylic acid include polishes, paints, coatings, rug backings, adhesives, plastics, textiles, and paper

Routes of Exposure

Exposure to acrylic acid can occur in the workplace or in the environment following releases to air, water, land, or groundwater. Acrylic acid enters the body when breathed in with contaminated air or when consumed with contaminated food or water. It can also be absorbed through skin contact. It does not remain in the body due to its removal in expired air and in urine.

Health Effects [4]

Acute Effects

- Acrylic acid is a strong irritant to the skin, eyes, and mucous membranes in humans. The liquid may cause blindness if splashed into the eye.
- Acute (short-term) exposure of rats to acrylic acid by inhalation has been observed to produce nose and eye irritation, lung haemorrhage, and degenerative changes in the liver and kidneys.
- Tests involving acute exposure of rats, mice, and rabbits have demonstrated acrylic acid to have moderate acute toxicity by inhalation or ingestion, and high acute toxicity by dermal exposure.

Chronic Effects

- Information on the chronic (long-term) effects of acrylic acid in humans is not available.
- In mice and rats chronically exposed to acrylic acid by inhalation, lesions of the nasal mucosa were observed.
- Reduced body weights and altered organ weights were observed in rats orally exposed to acrylic acid.
- The Reference Concentration (RfC) for acrylic acid is 0.001 milligrams per cubic metre (mg/m3) based on degeneration of the nasal olfactory epithelium in mice.
- The Reference Dose (RfD) for acrylic acid is 0.5 milligrams per kilogram body weight per day (mg/kg/d) based on reduced pup weights in rats.

Reproductive/Developmental Effects

- No information is available on the reproductive or developmental effects of acrylic acid in humans.
- Decreased body weight gain and decreased fertility were reported in one study of rats exposed to acrylic acid by ingestion, although the decrease in fertility was not statistically significant compared with the control.
- Embryotoxic and teratogenic effects (birth defects) were observed in rats injected with acrylic acid.

Cancer Risk

- No information is available on the carcinogenic effects of acrylic acid in humans.
- In one study, squamous cell carcinomas of the skin were reported in mice treated topically with acrylic acid. Other animal studies have not reported carcinogenic effects.
- EPA has not classified acrylic acid for carcinogenicity.

Safety

First Aid Measures

- Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
- Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.
- Serious Skin Contact: Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
- Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Serious Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.
- Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Fire & Explosion Information

- Acrylic acid is flammable
- It's auto-ignition temperature is 438°C (820.4°F)
- The flash point for acrylic acid are closed cup: 50°C (122°F)
- Extremely flammable in presence of open flames and sparks. Highly flammable in presence of heat.
- Acrylic acid is a flammable liquid that is soluble or dispersed in water. Dry chemical powder should be used on small fires. For large fires, use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Exposure Controls & Personal Protection

Engineering Controls

- Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective threshold limit value.
- Ensure that eyewash stations and safety showers are proximal to the workstation location.

Personal Protective Equipment

The following personal protective equipment should be used when handling acrylic acid:

- Face shield;
- Full suit;
- Vapour respirator (be sure to use an approved/certified respirator or equivalent);

- Gloves;
- Boots.

Personal Protection in Case of a Large Spill:

- Splash goggles;
- Full suit;
- Vapour respirator;
- Boots;
- Gloves;
- A self-contained breathing apparatus should be used to avoid inhalation of the product.
- Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Regulations [2,6]

United States

ACGIH: The American Conference of Governmental Industrial Hygienists has set a Threshold Limit Value (TLV) for acrylic acid of 2 ppm, 5.9 mg/m3 TWA; Skin; Appendix A4, Not Classifiable as a Human Carcinogen

NIOSH: The National Institute for Occupational Safety and Health has established a Recommended Exposure Limit (REL) for acrylic acid of 2 ppm, 6 mg/m3 TWA; Skin

Australia

Safe Work Australia: Safe Work Australia has recommends an 8 hour time weighted average (TWA) exposure limit for acrylic acid of 2 ppm (5.9 mg/m3)

References

- http://en.wikipedia.org/wiki/Acrylic_acid
- http://www.npi.gov.au/substances/acrylic-acid/index.html
- http://www.epa.gov/chemfact/f_acrlac.txt
- http://www.epa.gov/ttn/atw/hlthef/acrylica.html
- http://www.sciencelab.com/msds.php?msdsId=9922794
- https://www.osha.gov/dts/chemicalsampling/data/CH_217240.html

JANET'S CORNER

Who Am I?

12 Mar 2026

I am the oily, colorless champion of the chemical industry, produced in greater tonnage than any other chemical on Earth.

My exothermic reaction with water releases so much heat that adding water to me is famously dangerous—always add me to water, never the reverse!

I am born from the catalytic oxidation of sulfur dioxide, a process refined over centuries and now optimized in contact plants worldwide.

My corrosive power makes me essential for refining metals, producing fertilizers, processing petroleum, and manufacturing everything from steel to synthetic fibers.