

#CHEMMONTHLY FEBRUARY 2018

SUPERIONIC WATER MAY HELP EXPLAIN ICE GIANT MAGNETIC FIELDS

Researchers have found evidence that water forms a superionic state, with both solid and liquid features, at high temperatures and pressures. Further direct evidence is needed, but it could explain oddities in magnetic fields of the icy planets Neptune and Uranus.

EMISSIONS FROM HOUSEHOLD PRODUCTS HUGE UNDERESTIMATED

Cosmetics, cleaning agents, and other household products contribute more to volatile organic compound (VOC) emissions than previously thought. A new study suggests they may contribute up to half of fossil fuel VOC emissions in industrialised cities.

CHEMICAL PROCESSING MAKES WOOD STRONGER THAN STEEL

By boiling wood in an alkaline solution, then compressing it at 100°C, chemists made a processed wood with a higher strength per unit density than most metals and alloys. There are plans to commercialise the technology for vehicle and aerospace applications.

POLAR BEAR HAIR INSPIRES STEALTH CLOAK FOR RABBITS

The infrared radiation-reflecting abilities of polar bear hair have inspired a synthetic version that, when woven into a cloak, made rabbits practically invisible to infrared cameras. The fibre is made of a mixture of the silk protein fibroin and the polysaccharide chitosan.

OZONE LEVELS STILL DECLINING IN THE LOWER STRATOSPHERE

Despite the ban on CFCs leading to levels of ozone in the higher stratosphere increasing over the past 20 years, new evidence shows this is being offset by decreasing ozone levels in the lower stratosphere. The reasons behind this decline are unclear.

REVIEW CONFIRMS EFFECTIVENESS OF ANTIDEPRESSANTS

A six year review of over 500 trials of antidepressants has found that they are more effective than a placebo, confirming their importance in treating depression. Three drugs scored best for efficacy and tolerability: agomelatine, escitalopram, and vortioxetine.

NEW FAMILY OF ANTIBIOTICS DISCOVERED IN SOIL SAMPLES

By sequencing DNA from soil sample microbes, researchers have discovered a new class of antibiotics called malacidins. They work by halting bacteria cell wall synthesis, which means bacterial resistance to them is less likely to develop, and could treat MRSA in a rat model.

VOLATILE COMPOUNDS INDICATE DECAYING PLASTIC ARTEFACTS

Using gas chromatography-mass spectrometry, researchers have detected compounds that plastics such as nitrocellulose, polyurethane and polystyrene release as they degrade. The research could help museums analyse and conserve plastic artefacts.

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