The Year in Chemistry

COMPOUND INTEREST

2022'S BIGGEST CHEMISTRY STORIES

Concerns over increasing atmospheric methane

Methane is a potent greenhouse gas. Atmospheric concentration of methane rose by 17 ppb over 2021, a record rise. Around 30% of methane emissions are caused by production and use of fossil fuels.

JWST probes exoplanet atmospheres

NASA's James Webb Space Telescope detected carbon dioxide and sulfur dioxide in an exoplanet's atmosphere, as well as providing concrete evidence of photochemical reactions taking place there.

Wildfires set back ozone layer recovery

Researchers determined that the severe Australian wildfires in 2019 and 2020 affected levels of ozone in the stratosphere, setting back their recovery by a decade. More frequent wildfires could slow recovery more.

Evidence for two forms of liquid water

New evidence from experiments carried out with solutions of the sugar, trehalose, at low temperature and high pressure suggests that supercooled water may have two liquid states with differing densities.

Click chemistry wins Nobel Prize in Chemistry

This year's Nobel Prize was awarded for the development of click chemistry, reactions that snap together molecular building blocks, and its use in living cells without affecting their normal chemistry.

Graphene sensors can monitor blood pressure

New stick-on graphic sensors can measure blood pressure continuously instead of taking snapshots. The sensors use small electric currents to detect voltage changes associated with changes in blood volume.

New prefix for the mass of an electron

New SI unit prefixes for use with very large and very small numbers were adopted this year. The mass of an electron can now be described as being approximately one rontogram (10^{-27} grams).

Structure predictions for most known proteins

AlphaFold, an artificial intelligence system, has now predicted 3D structures for nearly all proteins that are currently known – over 200 million structures in total, from over 10 million species.

Universal flu vaccine successful in animals

A vaccine which aims to protect against all flu strains has been successfully trialled in mice and ferrets. The next step is clinical trials in humans. If these go well, the vaccine could be available in coming years.

Company to stop 'forever chemicals' production

Chemicals company 3M has said it will stop producing per- and polyfluoroalkyl chemicals by 2025. These substances persist in the environment and are increasingly linked with human health effects.

Lab-grown meat declared safe to eat

The US Food and Drug Administration (FDA) deemed lab-grown chicken to be safe for human consumption. Individual products will still need approval but it is a further step towards sustainable meat production.

Further steps towards sustainable jet fuels

A solar powered redox reactor which can produce kerosene from water and carbon dioxide was successfully scaled up. Other firms are building plants to make aviation fuel from biobased ethanol.

For additional details and links to the articles and studies referenced in this graphic, please visit: **bit.ly/TYIC2022**