

THE YEAR IN CHEMISTRY

2021'S BIGGEST CHEMISTRY STORIES

DEVELOPMENT OF ANTIVIRALS FOR COVID-19



Development and trials of antivirals against COVID-19 continued in 2021. As of December 2021, two oral antiviral drugs, molnupiravir and paxlovid, had been approved in the UK and the US.

FIRST MALARIA VACCINE APPROVED



The first malaria vaccine, approved for widespread use in children, has modest efficacy but showed positive results in pilot programs. It's also the first vaccine developed for any parasitic disease.

HIGHLY FLUORINATED COMPOUND RESTRICTIONS



Highly fluorinated per- and polyfluoroalkyl substances, used in textile coatings, food packaging, and cookware applications, saw mounting pressure to restrict their use due to concerns about environmental persistence.

RESEARCHERS CREATE METALLIC WATER



By dripping a liquid sodium-potassium alloy into a vacuum chamber containing water vapour, researchers were able to observe metallic water, formed as electrons from the alloy were drawn into the water.

ASYMMETRIC ORGANOCATALYSIS WINS NOBEL



The Nobel Prize in Chemistry was awarded to Benjamin List and David MacMillan for developing asymmetric organocatalysis, which uses organic compounds to catalyse the creation of mirror image molecules.

MAKING JET FUEL FROM CAPTURED CO₂



A rooftop refinery extracts carbon dioxide and water from the air and uses a solar-powered redox reactor to reduce them to carbon monoxide and hydrogen – from which hydrocarbon fuels can be made.

USE OF LEADED FUEL FINALLY PHASED OUT



Leaded petrol has been linked to numerous health problems. In July, Algeria became the final country in the world to stop selling leaded petrol, almost 20 years after the UN started a campaign to eliminate its use.

CONTROVERSIAL ALZHEIMER'S DRUG APPROVED



A drug which reduces amyloid- β plaques in the brain was approved for Alzheimer's patients in the USA in June. It's the first new approved Alzheimer's drug in 20 years, but there are doubts about its effectiveness.

AMINE CATALYSIS CLAIM DEBUNKED



A claim that an amine compound could replace palladium as a catalyst in a carbon-carbon bond forming reaction was shown to be erroneous. Palladium impurities were responsible for the observed catalysis.

SKIN OIL CHANGES IDENTIFY PARKINSON'S



Skin oil compounds secreted by people with Parkinson's disease differ from those secreted by people without the disease. This could aid diagnostics for Parkinson's and help with monitoring disease progression.

AI PREDICTS PROTEIN STRUCTURES



An artificial intelligence tool, AlphaFold, predicted structures for almost every protein made by the human body. The structures may help scientists understand protein functions and design new medicines.

HOME WEED-KILLERS PHASE OUT GLYPHOSATE



Glyphosate herbicides won't be sold for home use in the US from 2023. The move follows concern about glyphosate's effects on health, though it's primarily to avoid litigation – agricultural use will continue.

For additional details and links to the articles and studies referenced in this graphic, please visit: bit.ly/TYIC2021.