

Chemistry International—Freely-Available Across the World

From January 2022 *Chemistry International* will be freely-available to all in electronic form and will no longer be available in print. The objective is to make it readily-available to a much broader audience. It will still be published four times a year and whilst retaining its familiar layout, will be web based in a page-turning format from both the De Gruyter and IUPAC websites.

by Colin Humphris

Chair of *Chemistry International* Editorial Board

This is obviously a major change for *Chemistry International* that has been available in print form since 1979, but we want to leverage the opportunities of a digitally-connected world. We want to access a far larger international readership to raise interest in IUPAC and its valuable work. At the same time, we have had to recognise the limitations and costs of international distribution of paper magazines. During the autumn the Secretariat will be contacting all members and current subscribers to advise them of any changes to their membership and entitlements and promoting the new format and access.

This is a step towards a *digital first format* that IUPAC is currently working with DeGruyter to design. The eventual objective is to provide, news, comments, feature articles, project updates and book reviews in real time together with other digital features such as video and webinars. This is work in progress as we explore the capabilities of both the new DeGruyter publishing platform and our own website.

We feel this is an important symbolic, change as IUPAC adapts its data, standards and nomenclature to the digital needs of those who rely on us. Our first century was focussed on the printed form and the availability of reliable, validated chemical information was a key driver for innovation through the twentieth century. The pace of change is accelerating in a digital world and IUPAC will need to evolve to meet these needs. InChI is a good example of the different ways of working and the value of partnerships with users. Expect to see far more of this. These will be exciting times for the Union.

Please enjoy next year's page-turning format, encourage your friends and colleagues to both read *Chemistry International* and to contribute to it as a medium to highlight the pivotal role of chemistry in addressing the challenges the world faces today and tomorrow.

<https://iupac.org/what-we-do/journals/chemistry-international/>

IUPAC Announces the 2021 Top Ten Emerging Technologies in Chemistry

IUPAC has released the results of its 2021 search for the Top Ten Emerging Technologies in Chemistry. The goal of this project is to showcase the transformative value of Chemistry and

to inform the general public on the potential of the chemical sciences to foster the well-being of Society and the sustainability of our Planet. Following the same guidance as it did last year, the Jury*, a selection of international experts, identified different emerging technologies, scientific advances in between a discovery and a fully-commercialized ideas, with outstanding capacity to open new opportunities in chemistry, sustainability, and beyond. The 2021 finalists are (in alphabetical order):

- Artificial humic matter from biomass
- Blockchain technology
- Chemiluminescence for biological use
- Chemical synthesis of RNA and DNA
- Semi-synthetic life
- Single cell metabolomics
- Sonochemical coatings
- Superwettability
- Sustainable production of ammonia
- Targeted protein degradation

IUPAC Vice President, Javier García Martínez, said that "In the last months, we have witnessed how vital chemistry is in facing and overcoming our most pressing challenges. Moving forward, these threats will only be more complex and unpredictable—as the recent IPCC report alerts us to the risk posed by climate change for our survival. With the Top Ten Emerging Technologies in Chemistry, IUPAC provides a fresh look at technologies that are already creating new opportunities and opening new avenues for research and industry. I hope this year's edition arouses the same interest and attention as previous IUPAC Top Ten selections."

The 2021 Top Ten Emerging Technologies in Chemistry are further detailed in a feature article published in this issue of *Chemistry International*, see page 13. The author, Fernando Gomollón-Bel, remarks: "While highlighting breakthroughs for a circular, climate-neutral future, the selected technologies



will change our world for the better, making a more thoughtful use of our resources, favoring more efficient transformations, and providing more sustainable solutions in applications.”

The first selection of Top Ten Emerging Technologies in Chemistry was released in 2019 as a special activity honoring IUPAC’s 100th anniversary; the results were published in the April 2019 (*Chem Int*, 41(2), pp. 12-17, 2019; <https://doi.org/10.1515/ci-2019-0203>). The 2020 results were published in October 2020 (*Chem. Int.* 42(4) pp. 3-9, 2020; <https://doi.org/10.1515/ci-2020-0402>) 2019.

The next search for the Top Ten Emerging Technologies in Chemistry has already begun and the deadline for submission is 31 March 2022. It will be led again by Michael Droescher.

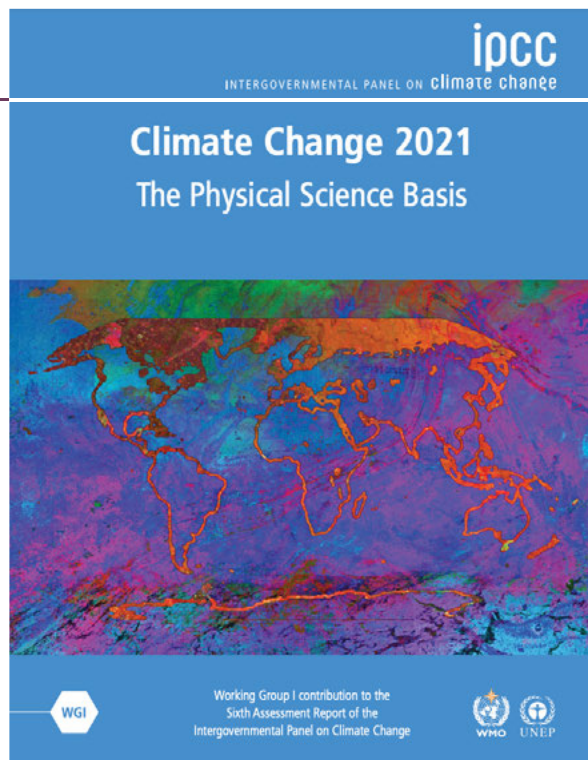
For more information on the 2019 and 2020 selections and on the search for the 2022 Top Ten Emerging Technologies in Chemistry go to: <https://iupac.org/what-we-do/top-ten/>.

*The Jury was an international group of objective and unbiased experts who reviewed and discussed a pool of nominations, and ultimately selected the final top ten. The following comprised the panel of judges for the 2021 Top Ten Emerging Technologies in Chemistry: Chair, Michael Droescher, (German Association for the Advancement of Science and Medicine), Jorge Alegre-Cebollada (Centro Nacional de Investigaciones Cardiovasculares, Spain), Sophie Carencu (French National Center for Scientific Research, France), Javier García Martínez (Universidad de Alicante, Spain), Ehud Keinan (Technion, Israel), Rai Kookana (CSIRO Land & Water, Australia), Greg Russell (University of Canterbury, New Zealand), Ken Sakai (Kyushu University, Japan), Natalia P. Tarasova (D. I. Mendeleev University of Chemical Technology, Russia), and Bernard West (Life Sciences Ontario, Canada).

Climate Change 2021—The Physical Science Basis

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body responsible for assessing the science related to climate change. The Sixth Report from IPCC Working Group I published in August 2021 paints a very sombre picture for the future. This report was commented on in a news item by the International Science Council (ISC) on behalf of its members, of which IUPAC is a founding member.

The report presents the latest advances in modelling and improved historical data to lead to the undeniable



conclusion that the whole world is experiencing the effects of climate change and that this is due to human activities. The extreme weather events which have occurred in 2021 are not taken into account. The goal of the Paris Agreement is that global warming is held to well below 2 °C with respect to pre-industrial values and efforts should be pursued to limit warming to 1.5 °C. All five emission scenarios considered in the IPCC report lead to warming greater than 1.5 °C and three of the five have warming of 2 °C or greater by 2041 to 2060. The curbing of greenhouse gas emissions, mainly carbon dioxide, reducing the carbon footprint, will improve the situation and could potentially reverse the temperature trend later in the century if decisive action is taken urgently now. Ambitious targets are required and implementation is needed immediately.

Chemistry, often referred to as the central science, is crucial in the battle against climate change. Ways of reducing consumption of energy in chemical reactions and processes, renewable fuels produced from sunlight with photocatalysts, reagent recycling and waste reduction, new and more efficient materials are all needed. IUPAC, as a worldwide resource for chemistry with over a thousand volunteer scientists who are experts in their fields of chemistry, from academia and industry, can and must make an important contribution to these questions.

Christopher Brett, IUPAC President commented: “This landmark report on climate shows the current state of the world and the need for decisive and incisive action. We strongly support the statement by the ISC and emphasise the important role that chemistry will