

Cross-Party Group on Science and Technology

Wednesday 13 April, 18:00-19:30

Catalysis and its impact on our planet

Minute

1. Attendance & apologies

MSPs

Clare Adamson, SNP (Convener); Martin Whitfield, Scottish Labour.

Invited guests

David MacMillan

Non-MSP Group Members

John Ball; Clare Reid; Gavin Gibson; Stewart Stevenson; William Duncan; Niall Somerville; Kathleen Hill; Andrew Mackenzie; Derek Stewart; Cat Ball; Alison McLure; Alfie Gaffney

Apologies

Benedict Leimkuhler; Katie O'Connor; Alistair Taylor; Sylvia McKay; Katherine Duncan; Karen Petrie; Fred Young; Stephanie Webb; Daria Tuhtar; Cristina Clopot

2. Minutes of the previous CPG meeting

The minutes of the previous CPG meeting were accepted by CPG members with no corrections or comments. The acceptance of the minutes was proposed by Clare Reid and seconded by Niall Sommerville.

3. Dates and themes for future meetings

It was agreed that a date for the next meeting of the CPG will be set in due course, and that this will be communicated by email.

It was noted that a future CPG meeting could be themed around equality in access to STEM, and that this could involve a representative from [SSERC](#) and [dressCode](#). It

was also noted that the Royal Society of Chemistry would be interested in participating in this session, given their work on Women in STEM and LGBT+ scientists (as mentioned in their [*Breaking the Barriers: Women's retention and progression in the chemical sciences*](#) (2018); [*Exploring the workplace for LGBT+ physical scientists*](#) (2019); and [*Missing Elements: Racial and ethnic inequalities in the chemical sciences*](#) (2022) reports). The Institute of Physics' '[*The importance of equality, diversity and inclusion in physics*](#)' report was also highlighted as an important paper that could inform any discussion on this topic.

Any further proposals for future themes would be welcomed. These can be submitted in writing to Alfie Gaffney, CPG Secretariat, at agaffney@rse.org.uk.

4. Catalysis and its impact on our planet lecture

During the lecture, the following topics were discussed: Professor MacMillan's personal and professional background; an overview of asymmetric organocatalysis; how to distinguish between mirror images and the biological implications of this (e.g., asymmetric organocatalysis as selectively creating one mirror image to avoid the negative implications of making the other, often metal, mirror image); the benefits of organocatalysis (e.g., that it is readily available, not sensitive to water or air, inexpensive, easy to handle, sustainable, and non-toxic); the role of nitrogen fixation in enabling population growth; industrial Nitrogen fixation; the manifold impacts of asymmetric organocatalysis on society and developing organic catalysts that work for many reactions; the Diels-Alder reaction as the first application of asymmetric organocatalysis; the work of Jöns Jacob Berzelius and his nomenclature (catalysis, protein, polymer, isomer, organic vs inorganics); the different kinds of catalysis, including organocatalysis, biocatalysis, metal catalysis, and photoredox catalysis (which has since been established as a separate field and enables the harnessing of sustainable solar energy to power chemical reactions); applications of asymmetric organocatalysis, including the creation of fragrances, including Lily of the Valley, the creation of recyclable plastic (by depolymerising plastic, e.g. breaking down polymers into monomers, and then remaking polymers), and medicinal applications (including migraine treatment via Telcagepant); the wider research community working on applications of organocatalysis; the importance of democratizing catalysis by providing an affordable and accessible solution which enables a range of people to undertake their own research; the role of the May and Billy MacMillan foundation.

For any further information on the lecture, please contact the Secretariat.

5. Discussion session

Following Professor MacMillan's presentation, a discussion session was held. The following topics were discussed: potential applications of asymmetric organocatalysis and how to further scale this to other contexts/industries/sectors; the importance of democratizing the scientific community and providing affordable solutions like organocatalysis that can be used on all continents to avoid the perpetuation of inequalities; how to motivate a research team and contend with failure; the research

policy landscape between the UK and US and how to encourage greater spending on R&D in the UK to harness the potential of academia.

6. AOB

There was no additional business discussed.