School of Chemistry

Aims and Objectives: Session 2022-2023

Module CH5511: Homogeneous Catalysis

Duration: 20 hours

Lecturers: Dr A. Kumar and Dr P. B. Webb*

(*Module Convenor)

Aims:

The products of catalysis are all around us; it is estimated that >35% of global GDP depends on catalysis. Looking into the future sustainable production is also reliant on catalysis, ensuring efficient utilization of energy and raw materials. The nature of homogeneous catalysts makes them amenable to spectroscopic and computational scrutiny. Advanced synthetic methods allow exquisite control of structure. All this offers the opportunity to design improved catalysts and processes.

By focusing on some detailed case studies this course aims to demonstrate the links between catalyst structure, performance, commercial utilization and sustainability.

Objectives:

1. To revise basic mechanistic transition-metal and organometallic chemistry.
2. To know and understand the elementary steps needed for the construction of a catalytic cycle.
3. To recognise, understand and apply methods based on transition-metal organometallics for the construction and transformation of carbon skeletons.
4. To recognise, understand and apply catalytic and stoichiometric methods of carbonylation.
5. To recognise, understand and apply methods for the elaboration of alkenes.