

CH3G9-15 Catalysis

26/27

Department

Chemistry

Level

Undergraduate Level 3

Module leader

Adrian Chaplin

Credit value

15

Module duration

5 weeks

Assessment

20% coursework, 80% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module builds on core concepts covered in Year 1 and Year 2 modules and laboratories and expands knowledge and understanding of homogeneous and heterogeneous catalysis. The module is divided into 3 core topics, which are interspersed with short revision/introduction sessions. The lectures will be supported by problem based workshops.

[Module web page](#)

Module aims

By the end of this module, students should be able to describe the mechanisms of common homogeneous and heterogeneous reactions, understand how selectivity can be achieved in catalytic reactions, deduce new mechanisms and interpret unseen experimental data and suggest suitable catalysts for a given transformation.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The module is split into 3 topics interspersed with short revision/introduction sessions. Each topic will be delivered via lectures and supported by workshops.

1: Bio/organocatalysis.

2: Homogenous transition metal catalysis.

3: Heterogenous catalysis.

Learning outcomes

By the end of the module, students should be able to:

- Use the correct terminology to describe and quantify catalytic processes
- Describe the mechanisms of homogeneous and heterogeneous reactions outlined in the syllabus with reference to the elementary steps involved and through application of concepts from organic, organometallic, inorganic, materials, and physical chemistry
- Understand how selectivity can be achieved in catalytic reactions by reference to the structure and electronic characteristics of the catalysts used
- Deduce new mechanisms and interpret unseen experimental data using the principles developed above
- Suggest suitable catalysts for a given transformation and predict how modifications to a given catalyst will impact productivity, reaction selectivity, and reaction outcome
- Appreciate contemporary and frontier directions of catalysis research

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

Subject specific skills

Functional Group Reactivity and Stereochemistry

Coordination Chemistry

Kinetics

Transferable skills

Communication

Sourcing information

Teamwork

Study

Study time

Type	Required
Lectures	21 sessions of 1 hour (7%)
Practical classes	4 sessions of 1 hour (1%)
Private study	125 hours (42%)
Assessment	150 hours (50%)
Total	300 hours

Private study description

N/A

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group D1

	Weighting	Study time	Eligible for self-certification
Assessment component			
Group video presentation	20%	30 hours	No
<p>The assessment is designed to develop student awareness of current problems and directions at the forefront of contemporary catalysis research and will be managed as a small group project. Each group will produce a recorded lecture style presentation overviewing a 'contemporary or frontier direction of catalysis research' with at least three illustrative examples from the recent scientific literature at a level suitable for their year 3 peers (15 min). A list of possible topics will be provided on a first come first serve basis, but student suggestions would be welcomed and subject to the discretion of the module leader. In addition to producing their own video, students would be required to watch and score others at random (up to 1 hour).</p>			
Reassessment component			
Individual video presentation			No
<p>A recorded lecture style presentation overviewing a 'contemporary or frontier direction of catalysis</p>			

	Weighting	Study time	Eligible for self-certification
research' with at least one illustrative example from the recent scientific literature at a level suitable for their year 3 peers.			

Assessment component

Centrally-timetabled examination (On-campus)	80%	120 hours	No
Written examination			

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- Answerbook Pink (12 page)
 - Periodic Tables
 - Students may use a calculator

Reassessment component is the same

Feedback on assessment

Cohort level examination feedback provided via Moodle following the Exam Board.

[Past exam papers for CH3G9](#)

Availability

Courses

This module is Optional for:

- UCHA-4 Undergraduate Chemistry (with Intercalated Year) Variants
 - Year 4 of F101 Chemistry (with Intercalated Year)
 - Year 4 of F122 Chemistry with Medicinal Chemistry (with Intercalated Year)
- UCHA-3 Undergraduate Chemistry 3 Year Variants
 - Year 3 of F100 Chemistry
 - Year 3 of F121 Chemistry with Medicinal Chemistry
- Year 4 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
 - Year 3 of F109 MChem Chemistry (with International Placement)
 - Year 3 of F111 MChem Chemistry with Medicinal Chemistry (with International Placement)

- UCHA-4M Undergraduate Master of Chemistry Variants
 - Year 3 of F105 Chemistry
 - Year 3 of F125 MChem Chemistry with Medicinal Chemistry
- Year 4 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry(with Intercalated Year)