

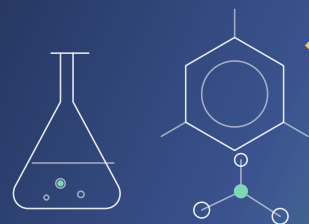
Module code

SPC-2205

Type of module

Undergraduate: Chemistry – Major Core

Molecular Symmetry and Organometallic Chemistry



Modular credits

4

Total student
engagement

56 hours

Prerequisite

SPC-1202 Fundamental
Concepts in Chemistry

Anti-requisite

None

Aims

To introduce students to the properties, bonding, and applications of f-block and organometallic compounds, and the use of group theory in molecular symmetry analysis.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse the properties of f-block metals.

MLO 2

Analyse bonding concepts in organometallic compounds, including hapticity and effective atomic number.

MLO 3

Interpret the reactivity and industrial applications of organometallic compounds.

MLO 4

Apply group theory to determine molecular symmetry and analyse vibrational spectra.

Module contents

d-block metals organometallic chemistry: hapticity, effective atomic number, bonding models

Sigma-bonding ligands: alkyls and aryls

Sigma-bonding ligands: alkylidenes, alkylidynes, and carbonyls

Reactivity of organometallic compounds

Industrial applications of organometallic compounds

Group theory: symmetry elements, symmetry operations and point groups

Applications to vibrational spectroscopy

Chemistry of f-block metals, their properties, and reactions

Assessment

60%

Examination

40%

Coursework

Examination
60%

Class tests
40%

■ Examination — 60%

■ Class tests — 40%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT		WEIGHTING
Examination		60%
Coursework		40%
Individual		40%
Class tests		40%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1

PLO 1 (Fundamental Knowledge in Chemistry)

3

PLO 3 (Critical Thinking and Problem-Solving Skills)

6

PLO 6 (Digital Literacy and Lifelong Learning Skills)

Sustainability concept addressed

4

SDG 4 Quality Education

9

SDG 9 Industry, Innovation, and Infrastructure

Digital skills/software used (not limited to)

- Word processing software (e.g. Microsoft Word)
- Data processing software (e.g. Microsoft Excel)
- Organisational tools (e.g. Outlook calendar)
- Learning management system (e.g. Canvas)

Micro-credentialling option

No

Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes

No

Document details

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