

**APPROVED**

## CHEM6006: Inorganic Chemistry

Module Details	
Module Code:	CHEM6006
Title:	Inorganic Chemistry <b>APPROVED</b>
Long Title:	Inorganic Chemistry
NFQ Level:	Fundamental
Valid From:	Semester 1 - 2019/20 ( September 2019 )
Duration:	1 Semester
Credits:	5
Field of Study:	4421 - Chemistry
Module Delivered in:	<a href="#">3 programme(s)</a>
Module Description:	This module introduces the student to compounds of main group elements; their structure, bonding and energies. It describes bonding theories and complexes, as well as the solution to a range of inorganic chemistry problems.

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	Learning Outcome Description
LO1	Describe periodicity and atomic structure. Apply Valance bond and Molecular orbital theories of chemical bonding.
LO2	Determine structures of main group inorganic compounds, crystals and ions. Calculate the energy involved in ionic salt formation.
LO3	Apply aqueous equilibria. Solve some related problems.
LO4	Outline the theory of complex formation and their fundamental properties.
LO5	Apply a range of practical laboratory skills and solve related inorganic chemistry problems.
Dependencies	
Module Recommendations	
Incompatible Modules	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
No requirements listed	

Indicative Content	
<b>Atomic Theory</b> Introduction to Quantum theory, wave/particle properties of matter; periodic classification; properties of electronic configuration.	
<b>Chemical bonding and intermolecular attractions</b> Lewis structures, shapes of molecules, ions; Intermolecular forces; Born Haber Cycles, lattice energy; Molecular orbital theory, MO diagrams (diatomic and simple polyatomic molecules), Metallic bonding, conductors/semiconductors, alloys.	
<b>Structures of Inorganic compounds</b> Unit cells; close packing of spheres; Structures of ionic and covalent crystals; crystals of non metallic elements (Gp IV,V,VI,VII), allotropy.	
<b>Aqueous Equilibria</b> Common ion effect; pH titration curves; solubility equilibria, solubility product K <sub>sp</sub> , factors affecting solubility, precipitation.	
<b>Coordination Complexes</b> Warner Theory; nature of metal-ligand bond; complex charges, coordination number, geometry; ligands; naming of complexes.	
<b>Practical Programme</b> Selection of practicals in aqueous chemistry and complex formation.	

Module Content & Assessment	
Assessment Breakdown	%
Coursework	40.00%
End of Module Formal Examination	60.00%

### Assessments

Coursework			
Assessment Type	Short Answer Questions	% of Total Mark	10
Timing	Week 7	Learning Outcomes	1,2,3
Assessment Description Written theory assessment with associated calculations			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	30
Timing	Every Second Week	Learning Outcomes	5
Assessment Description Performance of laboratory practicals with associated reports and calculations.			
End of Module Formal Examination			
Assessment Type	Formal Exam	% of Total Mark	60
Timing	End-of-Semester	Learning Outcomes	1,2,3,4
Assessment Description End-of-Semester Final Examination			
Reassessment Requirement			
Repeat examination Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.			

## Module Workload

Workload: Full Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Theory and related calculations.	Every Week	3.00	3
Lab	Contact	Practical skill development.	Every Second Week	2.00	4
Independent & Directed Learning (Non-contact)	Non Contact	Personal study	Every Week	2.00	2
Total Hours					9.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					5.00

Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Theory and related calculations.	Every Week	3.00	3
Lab	Contact	Practical skill development.	Every Second Week	2.00	4
Independent & Directed Learning (Non-contact)	Non Contact	Personal study	Every Week	2.00	2
Total Hours					9.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					5.00

## Module Resources

### Recommended Book Resources

G. Raynon-Carham, T. Overtone. (2014), Descriptive Inorganic Chemistry, 6th. Freeman US, p.492, [ISBN: 9781464125577].  
M. Weller, T. Overtone, J. Rourke, F. Armstrong. (2018), Inorganic Chemistry, 7th. Oxford, p.949, [ISBN: 9780198768128].  
Shriver, P. Atkins, T. Overton, F. Armstrong, M. Weller, J. Rourke. (2011), Inorganic Chemistry, 5th. Oxford UK, p.763, [ISBN: 9780199599608].

### Supplementary Book Resources

K. M. Mackay, R. A. Mackay, W. Henderson. (2002), Introduction to modern inorganic chemistry, 6th. Nelson Thornes, Cheltenham, U.K., [ISBN: 9780748764204].  
A. Hodzovic. (2014), Solutions manual to accompany Inorganic Chemistry 6th ed, 3rd. Oxford UK, p.311, [ISBN: 9780198701712].  
F.A. Cotton, G. Wilkinson, P. Gaus. (2007), Basic Inorganic Chemistry, 3rd. Wiley, US, [ISBN: 9788126511143].

*This module does not have any article/paper resources*

*This module does not have any other resources*

## Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_SCHQA_8	<a href="#">Bachelor of Science (Honours) in Analytical Chemistry with Quality Assurance</a>	-1	Mandatory
CR_SCHEM_7	<a href="#">Bachelor of Science in Analytical and Pharmaceutical Chemistry</a>	-1	Mandatory
CR_SCHEM_6	<a href="#">Higher Certificate in Science in Chemistry</a>	-1	Mandatory