

INTRODUCTION TO ADVANCED CHEMISTRY



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AIM OF THE CHEMISTRY ACDA 5014 MODULE

To build on the concepts introduced in the level 4 Chemistry (OME) module.

Expanding and extending ideas developed, introducing more detailed explanation of the chemical principles associated with the functioning of OME devices.

Introduction of the concepts of materials chemistry and effects.



LEARNING OUTCOMES

Upon the successful completion of this module the student should be able to:

- Critically analyse concepts of heat and thermodynamics, to explain the chemistry of solid phases and their interaction with other phases.
- Demonstrate a detailed understanding of reaction chemistry, ranging from complex chemical reactions to chemical compatibility of OME components.
- Analyse critically the design of chemical components for the life-time of an OME system or device, from manufacture, through storage, use and/or disposal.



INDICATIVE CONTENT

- Advanced chemical reactions and chemical kinetics.
- Advanced System Thermodynamics and energy release.
- Materials chemistry – states of matter, phase transformations, polymers, crystals, glasses.
- Mechanical properties of the solid state.
- Chemical compatibility and testing methods.



ASSESSMENT

There will be 2 graded quizzes

Each quiz contributing to the grade will be worth 25%

Written exam (2h) – 50%



(TENTATIVE) TIMETABLE

		Date	Session 1	Session 2
BLOCK 1	Week 1	21.02	Lecture 1: Introduction + Periodic Table	
		22.02	Lecture 2: Light and Atomic structure	Lecture 3: Periodic properties and electronic configuration
		23.02	Lecture 4: Molecular structure and bonding	
		24.02	Lecture 5: VSEPR and Polarity	
		25.02	Lecture 6: Stoichiometry: moles, balancing equations, concentrations	
	Week 2	28.02	Review of last week material; Lecture 7: Gases	
		1.03	TEST: Week 1 material; Lecture 8: Solids and Liquids	Lecture 9: Reactions (e.g nitration)
		2.03	Lecture 10: Thermochemistry	
		3.03	Lecture 11: Kinetics	
		4.03	Lecture 12: Equilibrium	
BLOCK 2	Week 3	25.04	REVIEW of Block 1 material	
		26.04	TEST: Week 2 material Lecture 13: TBC	Lecture 14: TBC
		27.04	Lecture 15: TBC	
		28.04	Lecture 16: TBC	
		29.04	Lecture 17: TBC	

Electronic course notes will be provided in Moodle
Practice problems will be available

