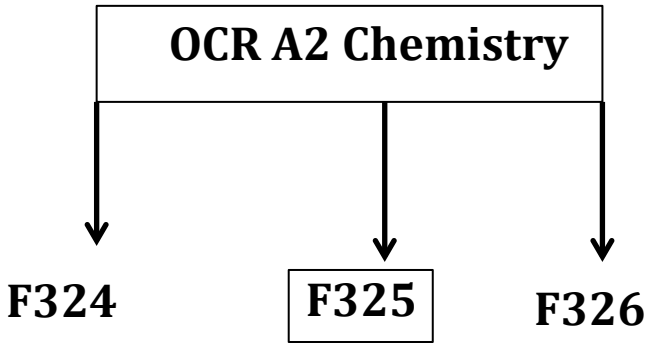
OCR Advanced GCE Chemistry A (H434)



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Unit F325: *Equilibria, Energetics and Elements* Paper code: F325 QP

1. Exam paper- Unit F325:
Equilibria, Energetics and Elements
Wednesday 15th June 2015 – 2 hours

25 % of Advanced GCE Chemistry

Overview of content

1. Module 1: Rings, Equilibrium and pH
2. Module 2: Energy
3. Module 3: Transition Elements

Overview of assessment

1. The unit is assessed through a 2-hour examination paper set and marked by OCR.
2. The total number of marks is 100.
3. Grades A*–E are available.
4. Grades assessment by year:

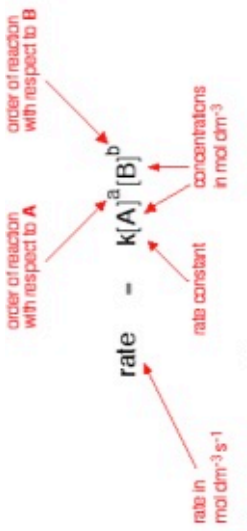
Year	Raw Marks to 90 % UMS - A*	Raw Marks to 80 % UMS grade 'A'
Jan 2010		
Jun 2010	81	71
Jan 2011	73	65
Jun 2011	80	72
Jan 2012	84	77
Jun 2012	82	76
Jan 2013	77	70
Jun 2013	82	74
Jun 2014	83	75
Jun 2015	?	?

OCR Advanced GCE Chemistry A

A2 unit F325: *Equilibria, Energetics and Elements*

Module 1: *Rates, Equilibrium and pH*

How Fast ?



How Far ?

In the reaction:

$aA + bB \rightleftharpoons cC + dD$

$K_c = \frac{[C]^c [D]^d}{[A]^a [B]^b}$

[A] = concentration of A in moldm^{-3}

a = number of moles of A

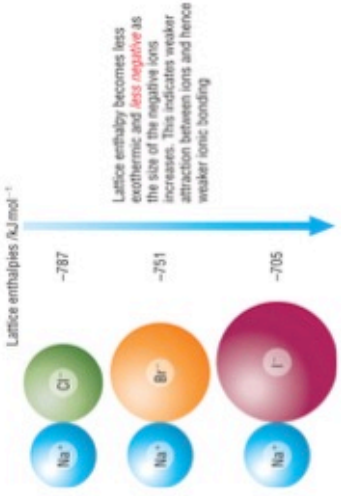
Acids, Bases and Buffers

$K_w = [H^+] [OH^-]$

At 298K = 10^{-14}mol^{2}dm^{-3}

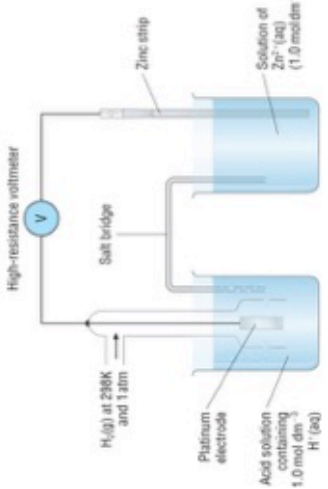
Module 2: Energy

Lattice Enthalpy



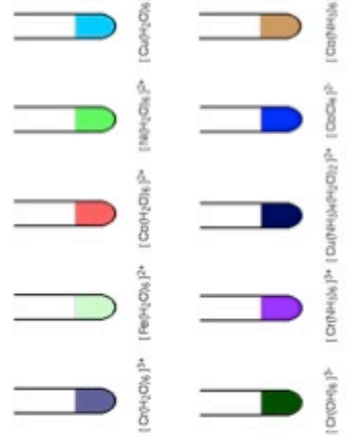
Entropy

Electrode potentials and fuel cells



Module 3: Transition Elements

Transition Elements



How BioChem Tuition prepares their students for F325: *Equilibria, Energetics and Elements?*

BioChem Tuition has a three-pronged strategy to attack F325 that helps students to attain A or A*.

1. **Detailed F325 knowledge:** The students will study the specification of OCR F325 alongside extensive practice of examination style questions to help them remember and practice relevant material. Every student will receive a 'specification handbook covering the specification notes prepared by BioChem tutors along with examination style questions'.

Key features

- ✓ F325 specification notes.
- ✓ F325 examination style past examination questions.
- ✓ 1-2-1 help in understanding the examiner points.
- ✓ Revision notes and charts to aid revision nearer the exams.

2. **Practice OCR past examination papers (2001-2014):** All students will complete at least 14 years of OCR past exam papers. BioChem Tuition will provide all the past papers in printed form to the students. Candidates are required to complete past papers, which are checked and marked in light of the official examiner report and mark scheme in the presence of the student. Any mistakes will be followed up to ensure the mistakes are not repeated. The students will be shown how to maximise their marks by following our exam technique and also methods to improve comprehension for scientific questions.

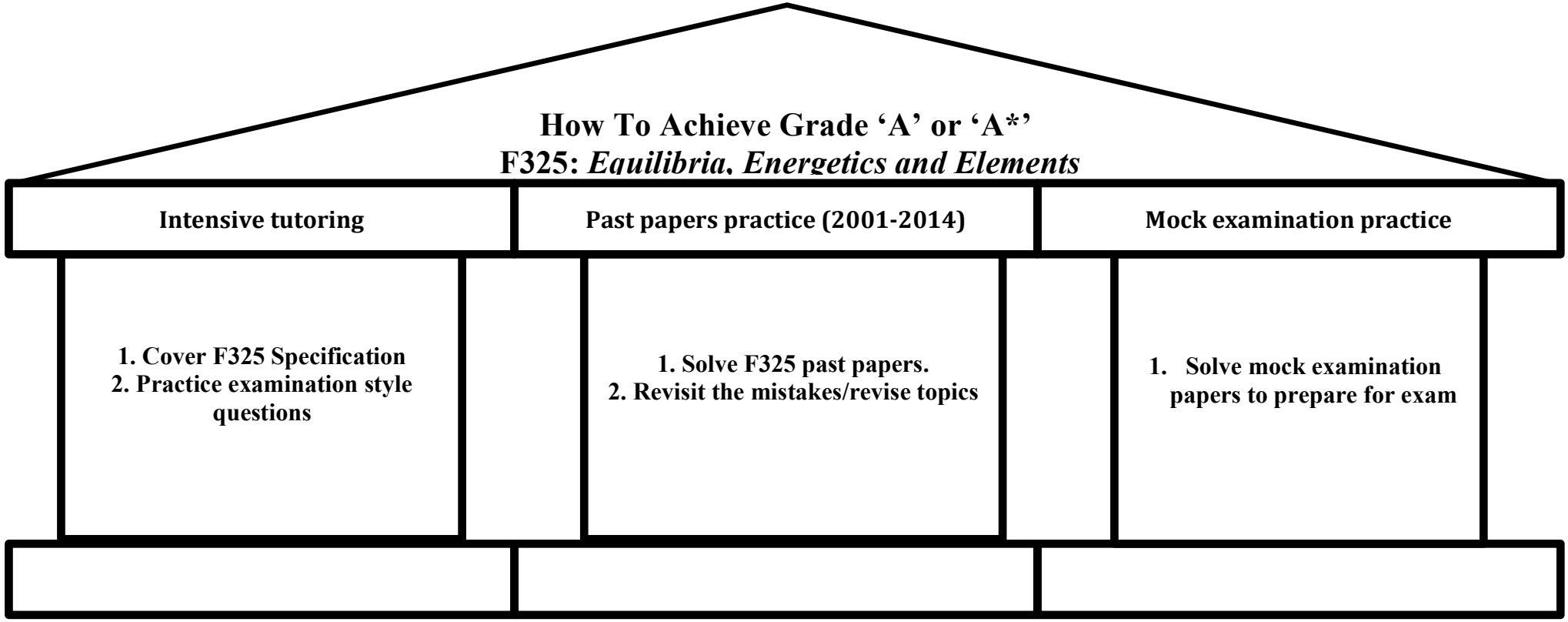
Key features

- ✓ 14 years of past examination papers practice.
- ✓ 1-2-1 help in understanding the exam technique.
- ✓ Revisit the mistakes and practice relevant questions to ensure the mistakes are not repeated.
- ✓ If student requires, past paper practice can be broadened by solving F325 style questions from exam boards AQA, CIE and Edexcel. The past papers booklets prepared by BioChem Tuition are available on request.

3. **Mock examination practice:** Mock examination practice to give student feedback on the likely grade achievable in the exams.

Key features

- ✓ Mock examination practice to simulate exam experience, which will be marked, graded and feedback on mistakes provided.


How To Achieve Grade 'A' or 'A*'
F325: Equilibria, Energetics and Elements
Intensive tutoring
Past papers practice (2001-2014)
Mock examination practice
1. Cover F325 Specification
2. Practice examination style questions
1. Solve F325 past papers.
2. Revisit the mistakes/revise topics
1. Solve mock examination papers to prepare for exam

F325 Tuition Plan

Tuition Plan for F325: *Equilibria, Energetics and Elements*	
Stage 1: Specification Topics	**Tuition time**
Module 1: Rates, Equilibrium and pH	**8 hours**
1.1 Rates, graphs, orders, rate equation and rate determining step • Concentration-time and rate-concentration graphs of reactions. • Rate equations and rate constant. • Rate determining step.	2 hours
1.2 Equilibrium • Expressions of Kc for homogenous reactions. • Temperature, pressure and concentration effects of Kc. • Explaining compromise of haber process in the form of Kc.	
1.3 Acids, bases and buffers • Bronstead-lowry acids and bases. • Strong and weak acids. • pH calculations of strong and weak acids. • Buffer solutions. • Calculating the pH of buffer solutions. • Carbonic acid-hydrogen carbonate buffer in blood. • Neutralization reactions.	2 hours
• Practice of past examination style questions on Rates, equilibrium and pH.	4 hours
Module 2: Energy	**8 hours**
2.1 Lattice Enthalpy and entropy • Key definitions. • Born Haber Cycles • Entropy change in a reaction. • Balance between enthalpy and entropy changes. Gibbs free energy.	2 hours

2.2 Electrode potentials and fuel cells • Redox reactions • Standard electrode potential and calculating standard cell potential. • Feasibility of reactions • Storage and fuel cells.	2 hours
• Practice of past examination style questions on module 2 – 'Energy'.	4 hours
Module 3: Transition Elements	**8 hours**
• General properties of transition elements • Precipitation reactions • Ligands and complex ions • Ligand substitution reactions • Redox chemistry	4 hour
• Practice of past examination style questions on 'Transition Elements'.	4 hours
Stage 2: Past paper practice	**10-14 hours**
• Practice of past examination papers from 2001 to 2014 relevant to **F325:** ***Equilibria, Energetics and Elements*** ✓ 14 years of past examination papers practice. ✓ 1-2-1 help in understanding the exam technique. ✓ Revisit the mistakes and practice relevant questions to ensure the mistakes are not repeated. ✓ Past paper practice can be extended by solving F325 style questions from other exam boards such as AQA, CIE and Edexcel.	**10- 14 hours**

Stage 3: Mock examination practice	4 hours
• Mock examination practice to simulate exam experience, which will be marked, graded and feedback on mistakes provided by BioChem Tutors.	4 hours