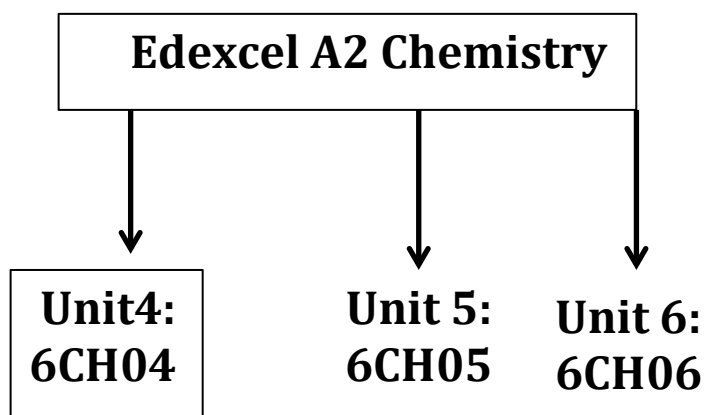


Edexcel A2 GCE Chemistry (9CH01)

Edexcel A2 Unit 4:
Rates, equilibria &
organic chemistry



Dr. Faisal Rana
Landline: 02076031928
Mobile: 07783919244
www.biochemtuition.com
faisal.rana@me.com

Unit 6CH04: Rates, equilibria & further organic chemistry Paper code: 6CH04

1. Exam paper Rates, equilibria & further organic chemistry
10th June 2015 (afternoon)

20 % of
Advanced GCE
Biology

Overview of content

1. Module 1: How fast? - rates
2. Module 2: How far? - entropy
3. Module 3: Equilibria
4. Module 4: Application of rates and equilibrium
5. Module 5: Acid/base equilibria
6. Module 6: Further organic chemistry
7. Module 7: Spectroscopy and Chromatography

Overview of assessment

1. The unit is assessed through a 1-hour and 40 min examination paper set and marked by Edexcel.
2. The total number of marks is 90 and contains **Section A** (MCQs) and **Section B** (mixture of short answer and extended answer questions) and **Section C** (Data questions and will require students to select the necessary information from data booklet).
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 2009		-
Jun 2009		-
Jan 2010	63	56
Jun 2010	77	69
Jan 2011	70	64
Jun 2011	80	72
Jan 2012	75	69
Jun 2012	75	68
Jan 2013	79	73
Jun 2013	74	69
Jun 2013 -R	75	69
Jun 2014	75	69
Jun 2014 -R	77	71
Jun 2015	?	?

Edexcel A2 GCE Chemistry

A2 unit 6CH04: Rates, equilibria and organic chemistry

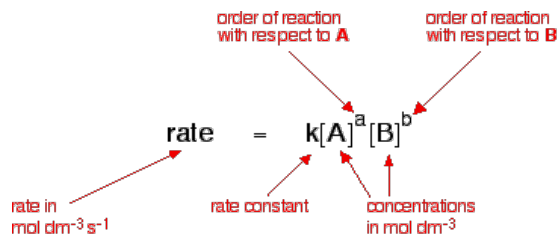
Module 1/2: Rates & Entropy

Module 3/4: Equilibria

Module 3: Acids & base equilibria

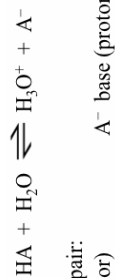
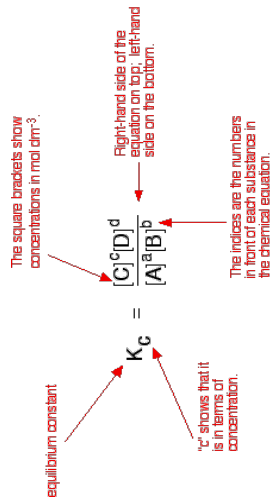
Module 4: Further Organic Chemistry

Module 5: Spectroscopy and Chromatography

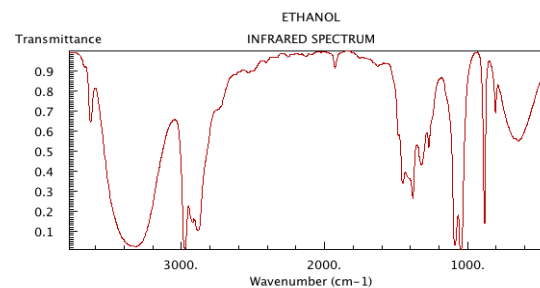


entropy

Measure of disorder



$$\text{pH} = -\log_{10} [\text{H}_3\text{O}^+]$$



How BioChem Tuition prepares their students for 6CH04: Rates, equilibria and organic chemistry?

BioChem Tuition has a three-pronged strategy to attack 6CH04 that helps students to attain A or A*.

1. **Detailed 6CH04 knowledge:** The students will study the specification of Edexcel 6CH04 alongside extensive practice of examination style questions to help them retain the content of the syllabus. The students will receive detailed 6CH04 notes prepared by BioChem Tuition. This is accompanied by practice of examination style.

Key features

- ✓ 6CH04 specification notes.
- ✓ 6CH04 examination style past examination questions.
- ✓ 1-2-1 help in understanding the key examiner points.
- ✓ Revision notes and charts to aid revision.

2. **Practice Edexcel past examination papers (1995-2014):** The students will complete at least 14 years of Edexcel past exam papers. BioChem Tuition will provide all the past papers in printed form to the students. The students 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.
- ✓ Past paper practice can be extended by solving 6CH04 style questions from AQA, CIE and OCR exam boards.

3. **Mock examination practice:** Mock 6CH04 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*'
6CH04: Rates, equilibria and organic chemistry

Intensive tutoring

Past papers practice (6CH04-2014)

Mock examination practice

- 1. Cover 6CH04 Specification**
- 2. Practice examination style questions**

- 1. Solve 6CH04 past papers.**
- 2. Revisit the mistakes/revise topics**

- 1. Solve mock examination papers to prepare for the exam**

6CH04 Tuition Plan

Tuition Plan for 6CH04: Rates, equilibria and organic chemistry	
Stage 1: Specification Topics	Tuition time
Module 1/2: How fast? – Rates & How far? - Entropy	8 hours
<p>Module 1: how fast? – rates</p> <ul style="list-style-type: none"> • Rates of reactions and measuring rates of reactions, • Rate equation, orders, clock reactions, concentration-time graphs verses rate-concentration graphs, rate determining step, • Mechanism of hydrolysis of halogenoalkanes – SN1 and SN2 	4 hour
<p>Module 2: how fast? – Entropy</p> <ul style="list-style-type: none"> • Entropy of reactions, dependence of entropy of reactions and understanding entropy change in reactions. • Relating experimental results to entropy changes in reactions – $S(\text{total}) = S(\text{system}) + S(\text{surroundings})$. • Finding $S(\text{surroundings})$. • Spontaneous reactions • Enthalpy change of hydration and factors affecting enthalpy reactions. 	
<ul style="list-style-type: none"> • Practice of past examination style questions on Rates and Entropy. 	4 hour

Module 3: Equilibria		8 hours
<p>TOPIC1: EQUILBRIUM REACTIONS</p> <ul style="list-style-type: none"> • Understand dynamic equilibrium and reversible reactions. • Equilibrium constant of a reaction. • Calculate a value of equilibrium constant of a reaction. • Construct expression K_c and K_p of a reaction. • Affects of temperature and pressure on equilibrium constant. • Compromise in an industrial process. • Steps taken in industry to maximize atom economy. <p>TOPIC2: ACIDS/BASE EQUILIBRIA</p> <ul style="list-style-type: none"> • Bronstead Lowry acid and acid-conjugate base pairs. • Define pH, K_a, K_w, pK_a and pK_w. • Weak acids and bases dissociation in water. • Find pH of weak acids and bases. • Titration curves • Buffer solutions and calculation of pH • Determining the K_a from the pH at the point where half the acid is neutralised. • Carbonic acid-bicarbonate buffer 	4 hours	
<ul style="list-style-type: none"> • Practice of past examination style questions on Equilibria. 	4 hours	

Module 4: Further organic chemistry		14 hours
<ul style="list-style-type: none"> • Chirality – E/Z isomerism, optical isomerism, racemic mixture, polarization of light and optical activity changes in a chemical reaction. • Carbonyl compounds – Aldehydes and ketones, physical properties of carbonyl compounds, reaction of carbonyl compounds,. • Carboxylic acids – Nomenclature, physical properties, preparation of carboxylic acids and reactions of carboxylic acids. • Derivative of Carboxylic acids – acyl chlorides, reaction and mechanism of acyl chlorides, esterification and reaction of esterification reaction. 		4 hours
Module 5: Spectroscopy and chromatography		
<ul style="list-style-type: none"> • Effects of radiation on molecules. • High-resolution proton spectra and interpretation of the spectra to determine the structure of molecules. • Mass spectrometry & IR from AS chemistry to determine the molecular mass and functional group presence in the organic molecule. • GC and HPLC to separate the components of the mixture. 		4 hour
<ul style="list-style-type: none"> • Practice of past examination style questions on further organic chemistry and spectroscopy/chromatography. 		6 hours

Stage 2: <i>Past paper practice</i>	10 hours
<ul style="list-style-type: none">• Practice of past examination papers from 1995 to 2014 relevant to 6CH04: Rates, Equilibria and Further Organic Chemistry<ul style="list-style-type: none">✓ 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 6CH04 style questions from other exam boards such as AQA, CIE and OCR.	10 hours