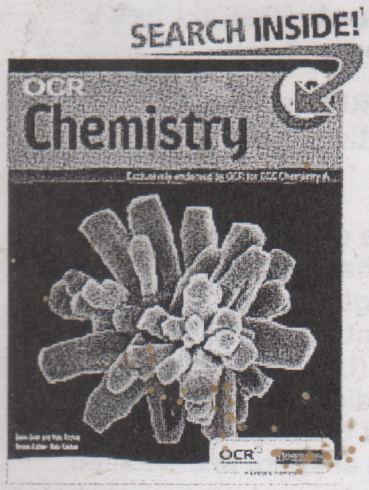
Useful Text books for the new OCR Chemistry Specifications



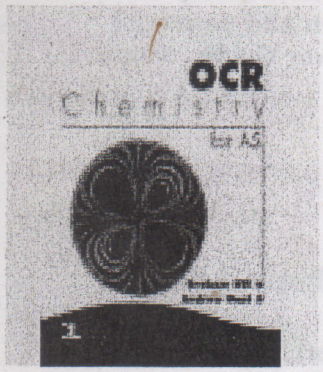
OCR AS Chemistry A Student Book and Exam Cafe CD-ROM [Illustrated] (Paperback)

by Rob Richie (Author), David Gent (Author)

RRP: ~~£17.99~~
Price: £17.43 & this item **Delivered FREE in the UK**

Synopsis

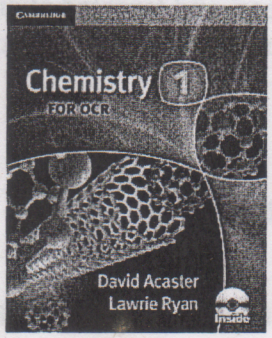
This is an accessible and engaging student resource that supports readers through the transition from GCSE to Further Education. It integrates 'How Science Works' throughout the book to help students understand the underlying principles of science. It includes our unique Exam Cafe CD-ROM which provides students with a motivating way to prepare thoroughly for their exams. It is packed with worked examples and exam-style questions to demonstrate how to approach complex questions. The exclusive partnership of OCR and Heinemann gives you confidence that this book is the perfect resource for the new specification.



OCR Chemistry for AS: WITH Dynamic Learning Student Edition CD-ROM by Graham Hill and Andrew Hunt (Paperback - 30 May 2008)
Buy new: ~~£18.99~~ £18.04

Synopsis

The AS Chemistry for OCR Student Book and CD-ROM have been developed by two highly experienced chemistry authors to support the revised OCR specifications. Each copy comes with a Student CD-ROM, providing interactive pages and additional resources such as tutorials on difficult concepts, weblinks and extension questions. Tailored precisely to the revised OCR specifications, the Student's Book provides both quick 'Test yourself' questions and end of chapter review questions. Data analysis and contemporary contexts activities are included throughout to help address the new How Science Works components. The single-user license CD-ROM additionally provides: - Data tables - Practical guidance, e.g on risk assessments, errors ad uncertainty and titrations- Personal Tutor audiovisual tutorials that work through selected problems and concepts using a voiceover and animated diagrams, graphs and worked calculations + Extension questions to stretch the most able.- Answers to all Test yourself questions in the Student's Book + Learning outcomes and specification checklists.



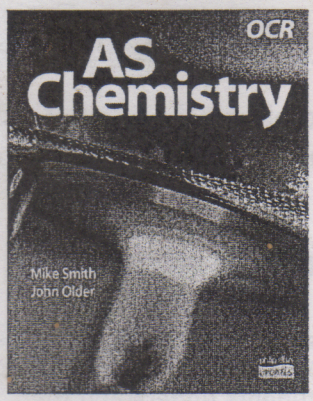
Chemistry 1 for OCR (Cambridge OCR Advanced Sciences) (Paperback)

by David Acaster (Author), Lawrie Ryan (Author), Brian Ratcliff (Contributor), Helen Eccles (Contributor), John Raffan (Contributor), John Nicholson (Contributor), David Johnson (Contributor)

RRP: ~~£16.95~~
Price: £16.49 & this item **Delivered FREE in the UK**

Synopsis

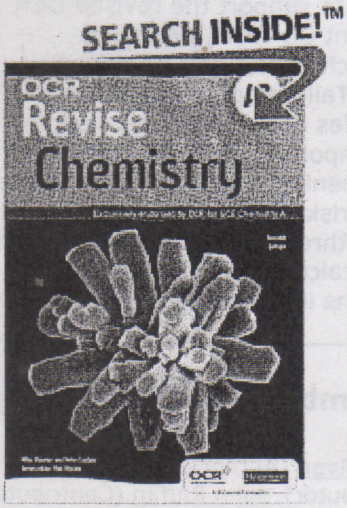
A new resource for the 2008 OCR specification providing supportive features and increased flexibility in teaching OCR A level Science. The trusted choice for the 2008 OCR Specification. Chemistry 1 clearly explains concepts and is supported by a CD-ROM in the back of the books that provides extra information and links to a free website full of e-learning activities. The book supports your teaching in the following way: The book comes with an interactive PDF CD-ROM that provides extra information for rapid advancement for pupils requiring it, without creating a heavy and intimidating book. The CD-ROM links to a free website full of e-learning activities, promoting independent and extension learning. Building on the popular and successful previous series of Cambridge Advanced Sciences, this new resource provides extra features and options within a familiar design. How Science Works information clearly boxed throughout the text Glossary of key words is included in the summary for ease of reference



AS OCR Chemistry: Textbook (Paperback)
by J. Older (Author), M. Smith (Author)
No customer reviews yet. Be the first.
£18.99 & this item **Delivered FREE in the UK** with Super Saver Delivery. See details and conditions

Synopsis
OCR AS Chemistry gives comprehensive coverage of Units 1 and 2 of the OCR A-level specification. Each chapter explores the relevant specification content and includes a range of examples to equip students with the skills to succeed in the examination. An important feature of the specification is the inclusion of centre-based practical assessment (Unit 3). A chapter is included to provide a clear discussion of the skills required for tackling this component.The accompanying CD-Rom includes chapter summary worksheets and offers guidance on exam technique and sample exam-style questions, together with graded answers and detailed commentaries. OCR AS Chemistry includes the following special features: l examiner's notes -- invaluable content guidance and exam advice l worked examples -- detailed explanations of calculations and exam-type questions l l stretch-and-challenge -- extension topics and questions at the end of each chapter Answers to all review, extension and summary worksheet questions are provided in an accompanying Teacher Answer Guide, which is available for purchase by teachers.

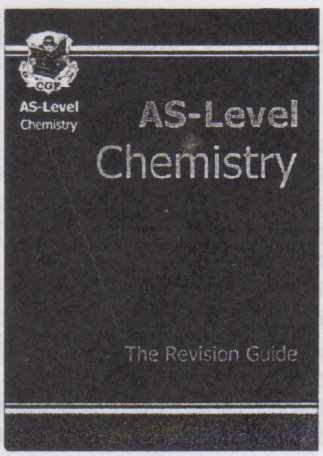
Revision guides



OCR AS Revise Chemistry A - New edition [Illustrated] (Paperback)
by Helen Eccles (Author), Mike Wooster (Author), Rob Ritchie (Author)

RRP: ~~£6.99~~
Price: £6.64 & eligible for **Free UK delivery**

Synopsis
This is exclusively endorsed by OCR for GCE Chemistry A. This book is clearly written and well designed to aid revision, and written by experienced examiners and tailored to the specification. It is Packed with examiner tips on tricky areas, and targeted at ensuring understanding with quick-check questions on each topic.



AS-Level Chemistry: OCR Revision Guide: (Paperback)
by Richard Parsons (Author, Editor)
Price: **£9.99** & eligible for **Free UK delivery** on orders over £15 with Super Saver Delivery.

Synopsis
This provides everything needed for AS-level Chemistry in one handy revision guide. It is designed to cover the whole course for all specifications. It's a fantastic product available in bookshops and for schools. Best of all, it's even got the usual brilliant, clear CGP explanations students and teachers know and love. In other words, it's exactly what you need at a sensible price too.

FORMULAE OF COMPOUNDS.

- When elements react together electrons are removed from one atom and added to another. This creates positively and negatively charged particles called **ions**.
- Many compounds are formed by these ions combining together.
- The ions will be positive for metals and negative for non-metals.
- When these ions are combined, the sum of the + charges is always the same as the sum of the -charges. So overall, the compound has no charge.
- Using these ideas it is possible to work out the formula of a compound - provided you know the charge on the ions.

Examples.

1. Sodium chloride: ions = Na^+ Cl^-
   Here + and -charges are equal; **so formula = NaCl**

2. Magnesium oxide: ions = Mg^{2+} O^{2-}
   Here + and -charges are equal; **so formula = MgO**

3. Magnesium chloride: ions = Mg^{2+} Cl^-
   Here 2 Cl^- ions will be needed to cancel out the Mg^{2+} **so formula = $MgCl_2$**

4. Sodium oxide: ions = Na^+ O^{2-}
   Here 2 Na^+ ions will be needed to cancel out the O^{2-}, **so formula = Na_2O**

> Note:
> For most metal elements, the charge of the ion is + (group no. in Periodic table).
>
> For most non-metal elements, the charge of the ion is – (8 – group no. in Periodic table).

A quick short cut is to swap the ion charges over and use them to represent the numbers of each atom – but you must remember to cancel them down to the lowest common denominator first.

e.g. Aluminium chloride = Al(3+) Cl(−) = $AlCl_3$

If you do use this method, remember the small numbers after the symbols represent the numbers of each atom. They are not ion charges, so don't include the ion charge sign. You are just using this as a 'cheat' to work out the combining ratio.

FORMULAE OF COMPOUNDS USING SIMPLE IONS

Use the boxes below to write the formulae of all possible compounds which can be made by combining the simple +ve ions with simple -ve ions.
N.B. you should know the names of the ions - if you don't then write them in the boxes.

	Br^-	Cl^-	F^-	I^-	O^{2-}	S^{2-}
Ag^+	AgBr	AgCl	AgF	AgI	Ag_2O	Ag_2S
Al^{3+}	$AlBr_3$	$AlCl_3$	AlF_3	AlI_3	Al_2O_3	Al_2S_3
Ba^{2+}	$BaBr_2$	$BaCl_2$	BaF_2	BaI_2	BaO	BaS
Ca^{2+}	$CaBr_2$	$CaCl_2$	CaF_2	CaI_2	CaO	CaS
Cu^{2+}	$CuBr_2$	$CuCl_2$	CuF_2	CuI_2	CuO	CuS
Fe^{2+}	$FeBr_2$	$FeCl_2$	FeF_2	FeI_2	FeO	FeS
Fe^{3+}	$FeBr_3$	$FeCl_3$	FeF_3	FeI_3	Fe_2O_3	Fe_2S_3
H^+	HBr	HCl	HF	HI	H_2O	H_2S
K^+	KBr	KCl	KF	KI	K_2O	K_2S
Li^+	LiBr	LiCl	LiF	LiI	Li_2O	Li_2S
Mg^{2+}	$MgBr_2$	$MgCl_2$	MgF_2	MgI_2	MgO	MgS
Na^+	NaBr	NaCl	NaF	NaI	Na_2O	Na_2S
Pb^{2+}	$PbBr_2$	$PbCl_2$	PbF_2	PbI_2	PbO	PbS
Zn^{2+}	$ZnBr_2$	$ZnCl_2$	ZnF_2	ZnI_2	ZnO	ZnS

week ①

FORMULAE OF COMPOUNDS -including complex ions or radicals.

- Some ions are not produced from single atoms but instead have a number of different atoms joined together. These are called radicals.
- These can form compounds in the same way as the simple ions but problems arise when writing their formulae.

Examples.

1. Sodium carbonate: ions = Na^+ CO_3^{2-}

   Here 2 Na^+ ions will be needed to cancel out the CO_3^{2-}

   So formula = Na_2CO_3

2. Magnesium hydroxide: ions = Mg^{2+} OH^-

   Here $2OH^-$ ions will be needed to cancel out the Mg^{2+}

   The formula $MgOH_2$ would be incorrect as this means one 'O' and two 'H's ; so instead brackets are put around the ions symbol to show clearly what is being 'doubled'

   So formula = $Mg(OH)_2$

3. Calcium nitrate: ions = Ca^{2+} NO_3^-

   Here 2 NO_3^- ions will be needed to cancel out the Ca^{2+}.

   The formula Ca NO_{32} would again be wrong, so brackets are put around the nitrate ion.

   So formula = $Ca(NO_3)_2$

4. Ammonium sulphate: ions = NH_4^+ SO_4^{2-}

   Here 2 NH_4^+ ions are needed to cancel out the SO_4^{2-}.

   The formula NH_{42} would again be wrong, so brackets are put around the ammonium ion.

   So formula = $(NH_4)_2SO_4$

IMPORTANT

Brackets should only be used when they are needed! That is, if

1. The ion contains more than one type of type of atom
2. You have to multiply the radical by a number to match the charges.

Only when both of the above apply, do you need to use brackets.

Names, symbols and charges of radicals

	Name	symbol	charge		Name	symbol	charge
	Chlorate(V)	ClO_3	-1	*	Carbonate	CO_3	-2
*	Hydrogencarbonate	HCO_3	-1	*	Sulphate	SO_4	-2
	Hydrogensulphate	HSO_4	-1		Sulphite	SO_3	-2
*	Hydroxide	OH	-1		Phosphate(V)	PO_4	-3
*	Nitrate	NO_3	-1				
	Nitrite	NO_2	-1	*	Ammonium	NH_4	+1

* most common

FORMULAE OF COMPOUNDS USING COMPLEX IONS

In the boxes below, write the formulae of the compounds made by combining the +ve ions with the complex -ve ions.
N.B. You should know the names of the ions - if you don't, write them in the boxes below each symbol.

	CO_3^{2-}	HCO_3^-	SO_4^{2-}	HSO_4^-	NO_3^-	OH^-
Ag^+	Ag_2CO_3	$AgHCO_3$	Ag_2SO_4	$AgHSO_4$	$AgNO_3$	AgOH
Al^{3+}	$Al_2(CO_3)_3$	$Al(HCO_3)_3$	$Al_2(SO_4)_3$	$Al(HSO_4)_3$	$Al(NO_3)_3$	$Al(OH)_3$
Ba^{2+}	$BaCO_3$	$Ba(HCO_3)_2$	$BaSO_4$	$Ba(HSO_4)_2$	$Ba(NO_3)_2$	$Ba(OH)_2$
Ca^{2+}	$CaCO_3$	$Ca(HCO_3)_2$	$CaSO_4$	$Ca(HSO_4)_2$	$Ca(NO_3)_2$	$Ca(OH)_2$
Cu^{2+}	$CuCO_3$	$Cu(HCO_3)_2$	$CuSO_4$	$Cu(HSO_4)_2$	$Cu(NO_3)_2$	$Cu(OH)_2$
Fe^{2+}	$FeCO_3$	$Fe(HCO_3)_2$	$FeSO_4$	$Fe(HSO_4)_2$	$Fe(NO_3)_2$	$Fe(OH)_2$
Fe^{3+}	$Fe_2(CO_3)_3$	$Fe(HCO_3)_3$	$Fe_2(SO_4)_3$	$Fe(HSO_4)_3$	$Fe(NO_3)_3$	$Fe(OH)_3$
K^+	K_2CO_3	$KHCO_3$	K_2SO_4	$KHSO_4$		
Li^+	Li_2CO_3	$LiHCO_3$	Li_2SO_4	$LiHSO_4$		
Mg^{2+}	$MgCO_3$	$Mg(HCO_3)_2$	$MgSO_4$	$Mg(HSO_4)_2$		
Na^+	Na_2CO_3	$NaHCO_3$	Na_2SO_4	$NaHSO_4$		
Zn^{2+}	$ZnCO_3$	$Zn(HCO_3)_2$	$ZnSO_4$	$Zn(HSO_4)_2$		
Pb^{2+}	$PbCO_3$	$Pb(HCO_3)_2$	$PbSO_4$	$Pb(HSO_4)_2$		
NH_4^+	$(NH_4)_2CO_3$		$(NH_4)_2SO_4$			

week 10

Writing and Balancing Equations

Below each of the word equations given below.

a) Write out the correct formula for each substance to create a symbol equation
b) Balance the equation by putting numbers **in front** of the formulae as appropriate

Remember you cannot balance an equation by changing the formula.
Each substance can have only one correct formula. This is worked out using the charges on the ions or the combing power of the atom. Altering the formula means that it represents a different substance.

1. hydrogen + oxygen ⟶ water

$2H_2$ O_2 $2H_2O$

2. zinc + hydrochloric acid ⟶ zinc chloride + hydrogen

Zn $2HCl$ $ZnCl_2$ H_2

3. sodium + chlorine ⟶ sodium chloride

$2Na$ Cl_2 $2NaCl$

4. magnesium oxide + hydrochloric acid ⟶ magnesium chloride + ~~hydrogen~~ water

MgO HCl $MgCl_2$ ~~H_2~~ H_2O

5. sodium + water ⟶ sodium hydroxide + hydrogen

Na H_2O $NaOH$ H_2

6. lithium + oxygen ⟶ lithium oxide

$2Li$ O_2 Li_2O_2

7. sodium hydroxide + sulphuric acid ⟶ sodium sulphate + water

$2NaOH$ H_2SO_4 Na_2SO_4 $2H_2O$

8. sodium carbonate + nitric acid ⟶ sodium nitrate + carbon dioxide + water

Na_2CO_3 $2HNO_3 \rightarrow 2NaNO_3 + CO_2 + H_2O$

Mg^{2+} OH^- $Mg(OH)_2$ Mg^{2+} Cl^-

9. hydrochloric acid + magnesium hydroxide ⟶ magnesium chloride + water

$2HCl$ $Mg(OH)_2$ $MgCl_2 + 2H_2O$

10. methane + oxygen ⟶ carbon dioxide + water

$CH_{4(g)} + 2O_2$ $CO_2 + 2H_2O$

Mg^{2+} O^{2-}

Mg^{2+} NO_3^-

11. magnesium oxide + nitric acid ⟶ magnesium nitrate + water

MgO $2HNO_3$ $Mg(NO_3)_2 + H_2O$

12. methane + oxygen ⟶ carbon monoxide + water

$2CH_4 + 3O_2$ $2CO$ $4H_2O$

13. sodium hydrogencarbonate ⟶ sodium carbonate + carbon dioxide + water

$2NaHCO_3$ $Na_2CO_3 + CO_2 + H_2O$

14. potassium hydroxide + copper(II) sulphate ⟶ copper(II) hydroxide + potassium sulphate

$2KOH + CuSO_4$ $Cu(OH)_2 + K_2SO_4$

15. Ammonium hydroxide + hydrochloric acid ⟶ ammonium chloride + water

$NH_4OH + HCl$ $NH_4Cl + H_2O$

K^{1+} OH^-

Cu^{2+} SO_4^{2-}

Cu^{2+} OH^-

NH_4^+ OH^-

Cl^-

3 **Less reactive metals react with steam to form a metal oxide and hydrogen**

e.g MAGNESIUM + STEAM → MAGNESIUM OXIDE + HYDROGEN
Mg(s) + $H_2O(g)$ → MgO(s) + $H_2(g)$

A ZINC + STEAM → Zinc Oxide + hydrogen
$Zn + H_2O \rightarrow ZnO + H_2$

B ALUMINIUM + STEAM → Aluminium Oxide + hydrogen
$2Al + 3H_2O \rightarrow Al_2O_3 + 3H_2$

4 **Metals react with acids to form metal salts and hydrogen.**

e.g. ZINC + SULPHURIC ACID → ZINC SULPHATE + HYDROGEN
Zn(s) + $H_2SO_4(aq)$ → $ZnSO_4(aq)$ + $H_2(g)$

A MAGNESIUM + SULPHURIC ACID → Magnesium Sulphate + hydrogen
$Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$

B ZINC + HYDROCHLORIC ACID → Zinc chloride + Hydrogen
$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

5 **Both metal oxides and metal hydroxides neutralize acids to form metal salts and water.**

e.g. COPPER OXIDE + SULPHURIC ACID → COPPER SULPHATE + WATER
CuO(s) + $H_2SO_4(aq)$ → $CuSO_4(aq)$ + $H_2O(l)$

A MAGNESIUM OXIDE + SULPHURIC ACID → Magnesium Sulphate + water
$MgO + H_2SO_4 \rightarrow MgSO_4 + H_2O$

B ZINC OXIDE + HYDROCHLORIC ACID → Zinc Chloride + water

ZnO $2Na$ $ZnCl + H_2O$

C SODIUM OXIDE + NITRIC ACID → Sodium Nitrate + water

Na_2O $2HNO_3$ $2NaNO_3 + H_2O$

D POTASSIUM HYDROXIDE + HYDROCHLORIC ACID → potassium chloride + water

KOH HCl KCl H_2O

E CALCIUM HYDROXIDE + SULPHURIC ACID → Calcium Sulphate + water

$Ca(OH)_2$ H_2SO_4 $CaSO_4 + 2H_2O$

F BARIUM HYDROXIDE + NITRIC ACID → Barium Nitrate + water

$Ba(OH)_2 + 2HNO_3$ ~~$Ba(NO_3)_2$~~ $Ba(NO_3)_2 + 2H_2O$

6 Metal carbonates react with acids to form metal salts, carbon dioxide and water.

e.g. COPPER CARBONATE + SULPHURIC ACID → COPPER SULPHATE + CARBON DIOXIDE + WATER

$CuCO_3(s) + H_2SO_4(aq) \rightarrow CuSO_4(aq) + CO_2(g) + H_2O(l)$

A MAGNESIUM CARBONATE + SULPHURIC ACID → Magnesium Sulphate + carbon dioxide + water

$MgCO_3 + H_2SO_4$ $MgSO_4 + CO_2 + H_2O$

B CALCIUM CARBONATE + NITRIC ACID → Calcium Nitrate + Carbon Dioxide + water

~~Na_2CO_3~~ ~~$2HCl$~~

$CaCO_3 + 2HNO_3$ $Ca(NO_3)_2 + CO_2 + H_2O$

C SODIUM CARBONATE + HYDROCHLORIC ACID → Sodium Chloride + Carbon Dioxide + water

$Na_2CO_3 + 2HCl$ $2NaCl$

D POTASSIUM CARBONATE + SULPHURIC ACID → Potassium Sulphate + Carbon Dioxide + water

$K_2CO_3 + H_2SO_4$ K_2SO_4 CO_2 H_2O