

B G C S E

CHEMISTRY

EXAMINATION PAPERS

UNDERSTAND • PRACTICE • SUCCEED





THE OPENHANDED CLASSROOM

LEARN MORE. ACHIEVE MORE. SMILE MORE.



BGCSE CLASSES

- ✓ Exam-Focused Learning
- ✓ Past Papers & Strategies
- ✓ Stronger Understanding
- ✓ Better Grades, Brighter Future



[**CLICK HERE**](#)



SAT CLASSES

- ✓ Smart Test Strategies
- ✓ Stronger Scores
- ✓ Time Management Skills
- ✓ College & Scholarship Ready



[**CLICK HERE**](#)



BJC CLASSES

- ✓ Clear, Simple Explanations
- ✓ Focus on Understanding
- ✓ Help That Fits Your Pace
- ✓ Build Confidence, Get Results



[**CLICK HERE**](#)



EXPERT TEACHING.
PROVEN RESULTS.



LEARN SMARTER.
ACHIEVE MORE.



FOCUSED SUPPORT.
REAL RESULTS.



THEOPENHANDEDCLASSROOM:
(242) 426-8891



THE OPENHANDED CLASSROOM

BGCSE FREE SOLUTIONS MANUALS

COMPLETE SOLUTIONS FOR ALL
MAJOR SUBJECTS

- ⦿ MATHEMATICS
- ⦿ ENGLISH LANGUAGE
- ⦿ HISTORY
- ⦿ RELIGIOUS STUDIES
- ⦿ ACCOUNTS
- ⦿ SCIENCES (BIOLOGY, PHYSICS,
COMBINED SCIENCE)
- ⦿ FOREIGN LANGUAGE
(FRENCH AND SPANISH)

UNDERSTAND. PRACTICE. SUCCEED.

[CLICK HERE](#)

EXAM-REAL.

EXAM-PROVEN.

FREE LISTENING COMPREHENSION — AUDIO FILES —



THE **EXACT AUDIO** USED
IN PAST BJC & BGCSE EXAMS



REAL EXAMS

The exact listening comprehension audio from past papers.



REAL PREPARATION

Hear what you'll hear in the real exam.



REAL RESULTS

Practise with purpose. Improve your confidence and performance.

AVAILABLE FOR:



BJC
ENGLISH



BGCSE
ENGLISH LANGUAGE



BJC
FRENCH



BJC
SPANISH



BGCSE
FRENCH



BGCSE
SPANISH

WHY THESE AUDIO FILES MATTER



EXACT AUDIO

The exact recordings used in past BJC & BGCSE exams.



EXAM FAMILIARITY

Get used to the real voices, speed, accents and exam conditions.



STRATEGIC ADVANTAGE

Walk in confident knowing exactly what to expect.



100% FREE

High quality. No cost. Just results.



CLICK HERE

DOWNLOAD • START PRACTISING



BETTER PREPARATION.
BETTER RESULTS.

You've got this!

PAST EXAMS. **REAL AUDIO**. BETTER PREP. GREATER CONFIDENCE.

School Number	Candidate Number
Surname and Initials	

CHEMISTRY

PAPER 3
(80 marks)

Monday 2 JUNE 2025 **12:00 NOON–1:30 P.M.**
(1 hr. 30 mins)

Additional materials:
Graph paper
Calculator (not graphing)

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS
--

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS AND INFORMATION TO CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials at the top of this page as well as at the top of all lined paper submitted.

Answer **ALL** questions in **Section A** in the spaces provided on this question booklet and any **TWO** questions from **Section B** on the lined paper provided at the back of this question booklet.

Equations and diagrams should be given wherever they are helpful.
Essential working must be shown.

The intended marks for each question or part question are given in brackets [].

Relative atomic masses are given in the Periodic Table printed on page 2.

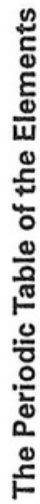
ADDITIONAL INFORMATION

s.t.p. ($t = 0^{\circ}\text{C}$, $p = 1 \text{ atm.}$)

The volume of one mole of gas at room temperature and pressure (r.t.p.) is $24\,000 \text{ cm}^3$ (24 dm^3).

For Examiner's Use	
Section A	
1	
2	
3	
4	
Section B	
5	
6	
7	
TOTAL	

This question paper consists of 16 printed pages and 4 lined pages.



Group

I	II											III	IV	V	VI	VII	0
¹ H Hydrogen 1																	
7 Li Lithium 3	9 Be Beryllium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminum 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulphur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	101 Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs Cesium 55	137 Ba Barium 56	139 La Lanthanum 57	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

a

X

b

Key

* 58-71 Lanthanoid series

† 90-103 Actinoid series

175 Lu Lutetium 71	173 Yb Ytterbium 70	169 Tm Thulium 69	167 Er Erbium 68	165 Ho Holmium 67	162 Dy Dysprosium 66	159 Tb Terbium 65	157 Gd Gadolinium 64	152 Eu Europium 63	150 Sm Samarium 62	144 Nd Neodymium 60	141 Pr Praseodymium 59	140 Ce Cerium 58
Lr Lawrencium 103	No Nobelium 102	Md Mendelevium 101	Fm Fermium 100	Es Einsteinium 99	Cf Californium 98	Bk Berkelium 97	Cm Curium 96	Am Americium 95	Pu Plutonium 94	238 U Uranium 92	Pa Protactinium 91	232 Th Thorium 90

*58-71 Lanthanoid series
†90-103 Actinoid series

a = relative atomic mass

X = atomic symbol

b = proton (atomic) number

Key

SECTION A

Answer **all** questions in this section.

1. Sodium metal is a reactive metal in group I of the Periodic Table. When sodium is exposed to air, it readily reacts with oxygen to form a layer of oxide on its surface.

- (a) Complete the table to determine the mass of oxygen reacted with sodium to form a layer of sodium oxide.

	Mass amounts
mass of sodium oxide layer formed (g)	0.62
mass of sodium reacted (g)	0.46
mass of oxygen reacted (g)	

[1]

- (b) (i) Use the data from the table in part (a) to show the empirical formula of sodium oxide is Na_2O .

[2]

- (ii) What does the empirical formula represents?

_____ [1]

- (c) Using your knowledge of electronic configuration, explain why sodium is more reactive than lithium metal.

_____ [2]



- (d) (i) Use the word equation to write a balanced chemical equation for the reaction.

Sodium + Water $\rightarrow$ Sodium hydroxide + Hydrogen

_____ [2]

- (ii) Use your balanced chemical equation in part (d) (i) to calculate the mass of hydrogen gas produced, if 1.6 moles of sodium is added to excess water.

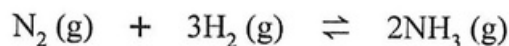
[2]

TOTAL MARKS [10]



2. Ammonia is an economically important chemical used to make fertilisers and nitric acid products in industries.

The reactions in the formation of ammonia is:



The reaction to produce ammonia is **reversible** and an **exothermic**.

- (a) (i) Name the process by which ammonia is made in the industry.
_____ [1]

- (ii) Write the mathematical expression for Charles' Law.

[1]

- (iii) If 720 dm³ of ammonia is produced at 20 °C (RTP), predict the volume of ammonia produced at 0 °C (STP). (Use Charles' Law for your calculation, assuming the pressure is same as at RTP).

[2]

- (b) According to Le Chatelier's Principle explain the effect on the yield of ammonia, produced if:

- (i) temperature increases.

_____ [2]

- (ii) pressure decreases.

_____ [2]

- (c) The catalyst used in the industry is finely divided or powdered iron.

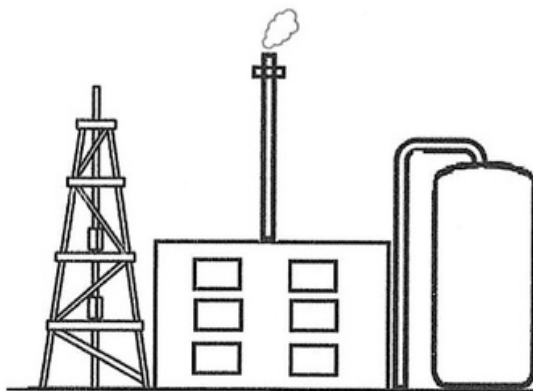
What is a catalyst, and explain in terms of particles, why catalysts like iron should have a large surface area.

[2]

TOTAL MARKS [10]



3. Below is a diagram of a refinery. Crude oil is broken down into organic compounds. Many of the compounds are not very useful due to their long chains.



- (a) These long chain, less useful, chemicals can be broken down into simpler, more useful organic compounds.

This process occurs in the presence of a zeolite catalyst (chromium oxide or aluminum oxide).

- (i) Name this chemical process. _____ [1]

- (ii) State **two** general characteristics of a homologous series of organic compounds.

1. _____

2. _____

[2]

- (iii) During the chemical process named in a (i), decane is broken down into two organic compounds alkane and alkene.

Complete the equation to show the two products formed.



- (b) The alcohol (ethanol) produced by fermentation is filtered to remove solid waste. The liquor containing 9–12% ethanol is then distilled.

(i) Why is ethanol distilled?

_____ [1]

- (c) Ethanol has a variety of uses including the preparation of an organic acid and also making esters.

(i) Name the type of reaction that causes alcohols to form an acid.

_____ [1]

(ii) Write a balanced chemical equation for the esterification reaction between propanol and ethanoic acid.

_____ [2]

(iii) Give a similarity between the reaction in (c) (ii) and neutralisation.

_____ [1]

TOTAL MARKS [10]



4. Tin is an element in Group IV.

(a) The position of tin is shown in the reactivity series.

aluminum

zinc

iron

tin

hydrogen

copper

- (i) For each of the reaction shown, use the given reactivity series to determine if a reaction would occur.

If there is a **reaction**, complete the equation.

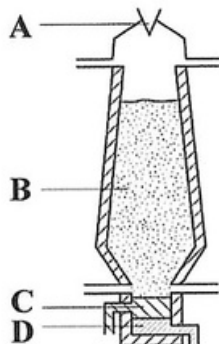
If there is no reaction, write '**no reaction**'.



- (ii) Explain why aluminum is **not** extracted from its oxide by reaction with carbon.

_____ [1]

- (b) The Blast Furnace diagram is shown below. It is used in the process of extracting iron from its ore.



- (i) Name the reducing agent in the initial stages of this extraction process.
_____ [1]
- (ii) In terms of electrons, explain the purpose of a reducing agent.

_____ [1]
- (iii) Complete the equation for the formation of iron from the iron (III) oxide ore.
 $\text{Fe}_2\text{O}_3(\text{s}) + \text{_____}(\text{g}) \rightarrow 2\text{Fe}(\text{l}) + \text{_____}(\text{g})$ [1]
- (iv) Calculate the mass of Fe produced from 80 g of Fe_2O_3 .
[2]
- (v) Identify which product is tapped off at C and D on the diagram.
C _____
D _____ [1]

TOTAL MARKS [10]



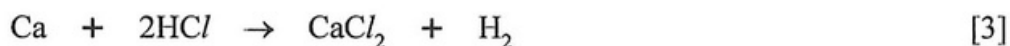
SECTION B

Answer any **TWO** questions from this Section.

5. Equal masses of calcium were used in **TWO** separate experiments to react with excess dilute hydrochloric acid. One of the experiments was conducted at 20 °C and the other at 30 °C. The volume of hydrogen gas produced was measured at regular intervals. The results of the experiments are given in the table.

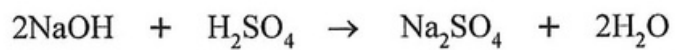
Time/s	0	10	20	30	50	60	80
Experiment – A Volume of H ₂ (g)/cm ³ at 20 °C	0	16.5	31.0	43.0	59.5	63.0	65.0
Experiment – B Volume of H ₂ (g)/cm ³ at 30 °C	0	19.0	44.5	49.5	64.0	65.0	65.0

- (a) (i) Plot a graph of the volume of hydrogen gas collected in each experiment using the same axes. Label the curves as **A** and **B**. [5]
- (ii) Use your graph to predict the volumes of hydrogen produced in experiment **A** at 40 seconds. [1]
- (iii) Which experiment proceeded at a faster rate and why? Explain in terms of collision theory. [1]
- (iv) Calculate the mass of calcium used to produce 0.3 g of CaCl₂. Use the equation to calculate.



- (b) Sodium hydroxide solution was used to neutralise hydrochloric acid in a titration reaction. A volume of 50 cm³ and concentration of 0.2 mol/dm³ sodium hydroxide solution neutralised 28 cm³ of hydrochloric acid.
- (i) Write a balanced chemical equation for the reaction. [1]
- (ii) Calculate the number of moles of sodium hydroxide used in the titration experiment. [2]
- (iii) Calculate the number of moles of hydrochloric acid that were neutralised. [1]
- (iv) Determine the concentration of hydrochloric acid. [1]
- (v) Calculate the concentration of sodium hydroxide in g/dm³. [2]

- (c) Consider the balanced chemical equation.



Calculate the number of moles of sodium hydroxide used to neutralise 0.15 mol of sulfuric acid. [1]

- (d) Hydrogen gas reacts with chlorine gas to produce hydrogen chloride gas, HCl .

Draw a Bohr model to show the bonding of hydrogen and chlorine in hydrogen chloride gas. [2]

TOTAL MARKS [20]



6. (a) Iodised table salt as it is usually sold is not pure NaCl. It contains small amounts of potassium iodide, which provides dietary iodine.

Dilute nitric acid and silver nitrate are added to a sample of chloride ions and a sample of iodine ions. State the observations. [2]

- (b) Magnesium reacts readily with oxygen to produce magnesium oxide.

(i) What is observed when magnesium reacts with oxygen? [1]

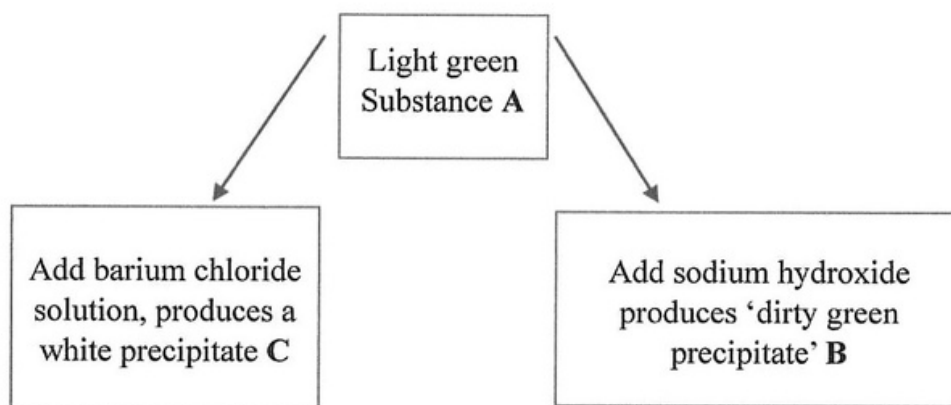
(ii) Neon does not readily react with oxygen compared to magnesium. Using your knowledge of electron configuration, explain what makes magnesium reactive and neon unreactive. [2]

(iii) Write a balanced equation for the reaction between magnesium and oxygen, producing magnesium oxide. [2]

(iv) Calculate the percentage composition of magnesium oxide. [1]

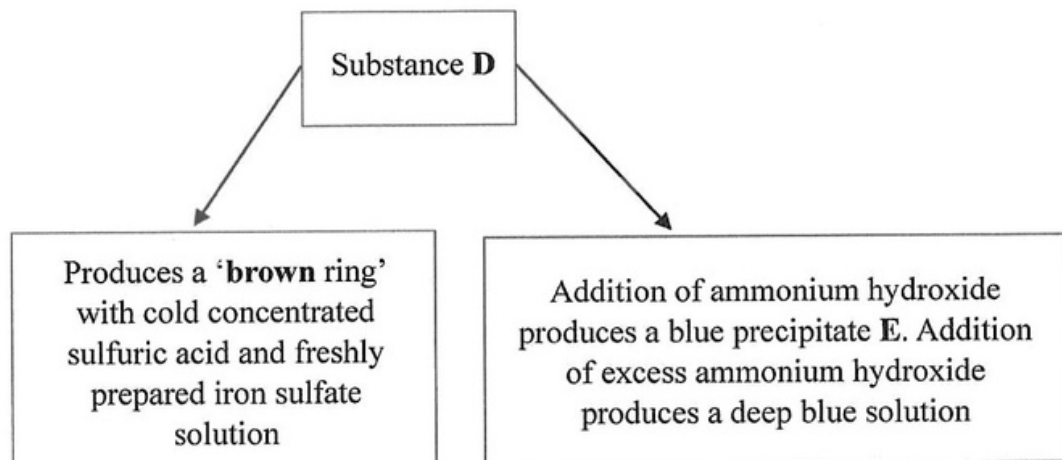
- (c) Identify the compounds in the flowchart below.

(i)



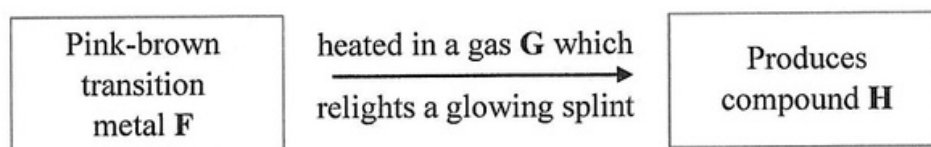
[3]

(ii)



[2]

(iii)



[3]

(d) Other than the pungent smell of ammonia, describe **two** tests which would enable you to identify ammonia gas. [2]

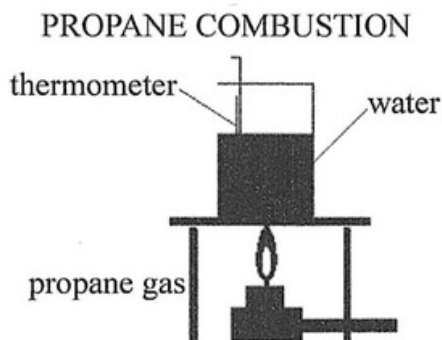
(e) Write a balanced chemical equation for reaction (c) (iii). [2]

TOTAL MARKS [20]



7. A student carries out an experiment to determine the heat energy released when cooking gas is burnt.

She used the apparatus shown.



- (a) (i) Calculate the temperature change in this reaction.
- Initial temperature reading 16.7°C
- Final temperature reading 22.3°C
- Temperature Change _____ [1]
- (ii) Mass of water used in the heating process is 100 g.
- Calculate the heat energy in kilojoules (kJ), in this experiment.
(Specific heat capacity of water is $4.2 \text{ J/g }^{\circ}\text{C}$). [2]
- (iii) The volume of propane gas burnt in this experiment was measured to be 1875 cm^3 .
- Calculate the **moles of propane gas** burned in this experiment. [2]
- (iv) Calculate the heat of combustion of the propane gas in kJ/mol. [2]
- (v) The heat produced in the experiment is **not** the same as the theoretical value.
- Give **one** reason for this and also a corrective measure. [2]

- (b) (i) Write the chemical equation for the combustion of propane. [2]
- (ii) Sketch an energy profile diagram for the combustion of propane. [3]
- (c) (i) State the name of the pollutant that would be produced if inadequate oxygen burns propane. [1]
- (ii) Explain the negative effect of this pollutant name in part (c) (i). [1]
- (d) Carbon dioxide is also a pollutant.
- (i) State **two** ways the percentage of carbon dioxide is increasing in the environment. [2]
- (ii) State **two** reasons why it is better to use renewable energy resources rather than non-renewable resources. [2]

TOTAL MARKS [20]



Question
Write on both sides of the paper

[illegible]

Question
Write on both sides of the paper

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Question
Write on both sides of the paper

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Question
Write on both sides of the paper

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.