

Subject: *A-Level Chemistry*

Exam Board: *OCR*

Welcome to A-level chemistry. We are delighted that you are considering A-level chemistry as an option in Year 12. To demonstrate your commitment to the course and to prepare you for September, you must complete the following tasks to the best of your ability. These tasks are compulsory and must be handed in by **FRIDAY 12TH JULY**.

We expect you spend at least 3 hours completing the tasks outlined in this pack. The activities have been designed to help you begin to develop some of the key skills you will need for A-level chemistry. **ALL WORKINGS MUST BE SHOWN.**

Success Criteria:

- Balance chemical equations.
- Work out relative molecular masses of compounds with and without brackets.
- Rearrange equations to calculate moles and mass of chemicals.
- Rearrange equations to calculate the volume of gas using moles.

Contacts for Support:

 Mrs Evans – Please email via [INSIGHT](#) or visit room 41.

What is chemistry?



A Level Chemistry will give you an exciting insight into the contemporary world of chemistry. It covers the key concepts of chemistry and practical skills are integrated throughout the course. This combination of academic challenge and practical focus makes the prospect of studying A Level Chemistry highly appealing.

You will learn about chemistry in a range of different contexts and the impact it has on industry and many aspects of everyday life. You will learn to investigate and solve problems in a range of contexts. The benefits of studying chemistry are:

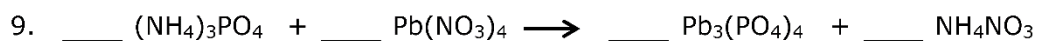
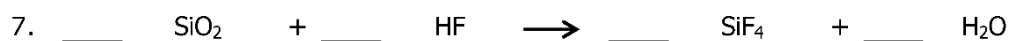
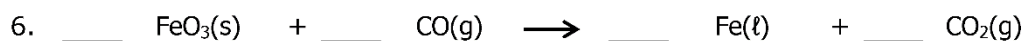
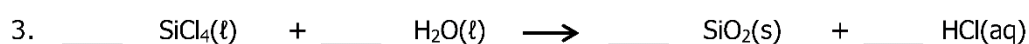
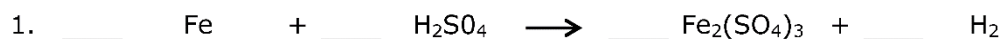
- An interesting and challenging experience to link key chemical ideas and understand how they relate to each other.
- The development of transferable skills including investigating, problem solving, research, decision making, mathematical skills and analytical skills.
- Opens up a range of possibilities for further study and careers associated with the subject.

| | | | | | |
|--|---|---|---|--|---|
| 30 Zn [Ar]4s ² 3d ¹⁰ zinc 65.39 | 31 Ga [Ar]4s ² 3d ¹⁰ 4p ¹ gallium 69.72 | 32 Ge [Ar]4s ² 3d ¹⁰ 4p ² germanium 72.58 | 33 As [Ar]4s ² 3d ¹⁰ 4p ³ arsenic 74.92 | 34 Se [Ar]4s ² 3d ¹⁰ 4p ⁴ selenium 78.96 | 35 Br [Ar]4s ² 3d ¹⁰ 4p ⁵ bromine 79.90 |
| 48 | 49 | 50 Sn | 51 Sb | 52 Te | 53 I |

Name: _____ Date: _____

Balancing Chemical Equations

Balance the following chemical equations.



Calculations.

- 1) How many moles are in 15 grams of lithium? (2)
- 2) How many grams are in 2.4 moles of sulphur? (2)
- 3) How many moles are in 22 grams of argon? (2)
- 4) How many grams are in 88.1 moles of magnesium? (2)
- 5) How many moles are in 2.3 grams of phosphorous? (2)
- 6) How many grams are in 11.9 moles of chromium? (2)
- 7) How many moles are in 9.8 grams of calcium? (2)
- 8) How many grams are in 238 moles of arsenic? (2)

What are the relative formula masses of the following compounds?

- 9) NaOH (2)
- 10) H₂O (2)
- 11) MgCl₂ (2)
- 12) H₃PO₄ (2)
- 13) Mn₂Se₇ (2)
- 14) (NH₄)₂SO₄ (2)

- 15) How many grams are in 4.5 moles of sodium fluoride, NaF? (2)
- 16) How many moles are in 98.3 grams of aluminium hydroxide, Al(OH)₃? (2)
- 17) How many grams are in 0.02 moles of beryllium iodide, BeI₂? (2)
- 18) How many moles are in 68 grams of copper (II) hydroxide, Cu(OH)₂? (2)
- 19) How many grams are in 43.3 moles of potassium sulfide? (2)
- 20) How many moles are in 1.2 x 10³ grams of ammonia? (2)
- 21) How many grams are in 2.3 x 10⁻⁴ moles of calcium phosphate, Ca₃(PO₃)₂? (2)

Exam Style Questions.

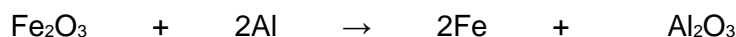
- 22) How many moles of carbon dioxide is 95.0 cm³? Give your answer to three significant figures. (2)
- 23) A mixture of chemicals contains sodium azide (NaN₃) which decomposes on heating to form sodium and nitrogen.



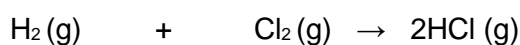
A typical air bag contains 130 g of sodium azide. Calculate the mass of nitrogen that would be produced when 130 g of sodium azide decomposes. (3)

- b) 1 g of nitrogen has a volume of 0.86 litres at room temperature and pressure. What volume of nitrogen would be produced from 130 g of sodium azide? (1)

- 24) Calculate the formula mass (M_r) of the compound iron (III) oxide, Fe_2O_3 . (3)
- b) Calculate the mass of iron produced when 32g of iron (III) oxide is completely reduced by aluminium. The reaction is shown in the symbol equation (3):

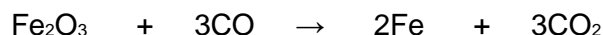


- 25) The balanced symbol equation for the reaction is



Starting with 2 g of hydrogen, what mass of hydrogen chloride would be produced? (3)

- 26) Iron is the most commonly used metal. Iron is extracted in a blast furnace from iron oxide using carbon monoxide.



A sample of the ore haematite contains 70% iron oxide. Calculate the amount of iron oxide in 2000 tonnes of haematite. (1)

- b) Calculate the amount of iron that can be extracted from 2000 tonnes of haematite. (3)

Write a **word and a balanced symbol equation** for the following reactions:

- 27) Calcium reacts with oxygen to form calcium oxide. (2)
- 28) Magnesium reacts with silver nitrate, AgNO_3 to form silver and a solution of magnesium nitrate $\text{Mg}(\text{NO}_3)_2$. (2)
- 29) Lead (II) nitrate, $\text{Pb}(\text{NO}_3)_2$ decomposes when heated to form lead (II) oxide, PbO and nitrogen dioxide and oxygen. (2)
- 30) Copper reacts with sulphuric acid to form water, a blue solution and a gas. (3)

