



# The Thomas Hardy School

## Summer Preparation Task

### A Level Chemistry

#### Purpose of task:

Consolidate and develop key skills and information from GCSE that is essential and assumed knowledge for A-level Chemistry.

#### Task:

In preparation for starting your A-level Chemistry course in September you will be required to print and complete this document. Submission will be in your first week back in September 2025.

#### Recommended resources

<http://www.bbc.co.uk/schools/gcsebitesize/chemistry/>

<http://www.s-cool.co.uk/gcse/chemistry>

[https://www.youtube.com/watch?v=UGf60kq\\_ZDI](https://www.youtube.com/watch?v=UGf60kq_ZDI)

GCSE revision books and chemistry class notes

#### **Ions Table** - *Complete the table below filling in the ions (Research this)*

| Positive Ions (Cations) |        | Negative Ions (Anions) |        |
|-------------------------|--------|------------------------|--------|
| Name                    | Symbol | Name                   | Symbol |
| Hydrogen                |        | Chloride               |        |
| Sodium                  |        | Fluoride               |        |
| Silver                  |        | Bromide                |        |
| Potassium               |        | Iodide                 |        |
| Lithium                 |        | Hydrogencarbonate      |        |
| Ammonium                |        | Hydroxide              |        |
| Barium                  |        | Nitrate                |        |
| Calcium                 |        | Oxide                  |        |
| Magnesium               |        | Sulphide               |        |
| Copper (I)              |        | Sulphate               |        |
| Copper (II)             |        | Carbonate              |        |
| Zinc                    |        | Phosphate              |        |
| Lead                    |        |                        |        |
| Iron (II)               |        |                        |        |
| Iron (III)              |        |                        |        |
| Aluminium               |        |                        |        |

**Deadline for Task:** Week commencing 14th September 2026

## Formulae of Ionic compounds

Ionic compounds contain positive and negative ions. The number of **positive charges** must equal the number of **negative charges** so that the compound has no charge overall.

## Brackets

Watch out for **compound ions**, e.g. *ammonium*, *hydrogencarbonate*, *hydroxide*, *nitrate*, *sulphate* and *carbonate*. If you need more than one of them to balance the charges, put brackets around their symbol.

*Complete the chemical formulae table using the ions table above*

## Chemical formulae

In the 1<sup>st</sup> 2 columns write the correct chemical formula, in the 2<sup>nd</sup> the correct name.

| Name               | Formula | Formula                                         | Name |
|--------------------|---------|-------------------------------------------------|------|
| Magnesium Fluoride |         | CaF <sub>2</sub>                                |      |
| Lithium Chloride   |         | KBr                                             |      |
| Calcium Chloride   |         | CuCl                                            |      |
| Copper (I) Iodide  |         | CuCl <sub>2</sub>                               |      |
| Potassium Bromide  |         | CuO                                             |      |
| Aluminum Oxide     |         | AlCl <sub>3</sub>                               |      |
| Iron(II) Oxide     |         | AgCl                                            |      |
| Aluminum Sulfide   |         | MgI <sub>2</sub>                                |      |
| Sodium Chloride    |         | NaBr                                            |      |
| Barium Chloride    |         | ZnCl <sub>2</sub>                               |      |
| Iron (III) Sulfate |         | LiF                                             |      |
| Iron (III) Sulfide |         | PbO <sub>2</sub>                                |      |
| Sodium Hydroxide   |         | AgNO <sub>3</sub>                               |      |
| Ammonium Bromide   |         | Na <sub>2</sub> CO <sub>3</sub>                 |      |
| Potassium Sulfate  |         | (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> |      |
| Sulfuric Acid      |         | KNO <sub>3</sub>                                |      |

## Decimal Points and Significant Figures

Molecular and Atomic Masses ( $M_r$  &  $A_r$ ) - 1 decimal place

Volumes - 2 decimal places

Moles - 3 significant figures

Concentrations - 3 significant figures

Temperatures - 1 decimal place

Masses - 2 decimal places

Good to know!



## Common Acids and Bases (alkali's) - *Complete the table below*

| Acids           |                      | Bases/Alkalis    |         |
|-----------------|----------------------|------------------|---------|
| Name            | Formula              | Name             | Formula |
| Sulphuric acid  |                      | Sodium hydroxide |         |
|                 | HCl                  |                  | KOH     |
| Nitric acid     |                      | Ammonia          |         |
| Phosphoric acid |                      |                  |         |
|                 | CH <sub>3</sub> COOH |                  |         |

## Balancing Equations

Balance the equation so that it has the same number of atoms of each element on each side. This can be done by putting the correct numbers in front of the formulae.

Write balanced symbol equations for the following chemical reactions.  
Remember to balance the equations.

1. Barium chloride + Sodium sulphate → Barium sulphate + Sodium chloride
2. Calcium + Oxygen → Calcium oxide
3. Calcium carbonate + Sulphuric acid → Calcium sulphate + Carbon dioxide + Water
4. Carbon + Oxygen → Carbon dioxide
5. Copper + Oxygen → Copper(II) oxide
6. Copper(II) oxide + Sulphuric acid → Copper(II) sulphate + Water

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7. Hydrogen + Chlorine  $\rightarrow$  Hydrogen chloride

8. Iron + Chlorine  $\rightarrow$  Iron(III) chloride

9. Iron(III) chloride + Ammonium hydroxide  $\rightarrow$  Iron(III) hydroxide + Ammonium chloride

10. Magnesium + Steam  $\rightarrow$  Hydrogen + Magnesium oxide

11. Magnesium + Sulphuric acid  $\rightarrow$  Hydrogen + Magnesium sulphate

12. Sodium + Oxygen  $\rightarrow$  Sodium oxide

13. Sodium hydroxide + Copper(II) sulphate  $\rightarrow$  Sodium sulphate + Copper(II) hydroxide

14. Sodium hydroxide + Phosphoric acid  $\rightarrow$  Sodium phosphate + Water

15. Sodium hydroxide + Sulphuric acid  $\rightarrow$  Sodium sulphate + Water

### Acid Reactions - *Complete the word equations below*

Acid + Base  $\longrightarrow$

Acid + Alkali  $\longrightarrow$

Acid + Metal  $\longrightarrow$

Acid + Metal carbonate  $\longrightarrow$

### Unit Conversions

100cm = 1m

1000g = 1kg

1000mg = 1g

10mm = 1cm

1dm<sup>3</sup> = 1000cm<sup>3</sup>

Good to know!



### *Write the equivalent measurement*

1) 8 g = \_\_\_\_\_mg

2) 9 mg = \_\_\_\_\_g

3) 6 kg = \_\_\_\_\_g

4) 4 cm = \_\_\_\_\_m

5) 12 mg = \_\_\_\_\_g

6) 6035 mm = \_\_\_\_\_cm

7) 0.32 m = \_\_\_\_\_cm

8) 5 dm<sup>3</sup> = \_\_\_\_\_m<sup>3</sup>

### Key Term Definitions

*Find the definitions for the following words:*

- Acid -
- Base -
- Exothermic -
- Endothermic -
- Isotope -
- Oxidation -
- Reduction -
- Atomic number -
- Mass Number -

## Calculations

a. Magnesium reacts with steam to produce hydrogen gas and magnesium oxide. The equation for the reaction is:



- (i) A teacher used 1.00 g of magnesium to demonstrate this reaction. Use the equation to calculate the maximum mass of magnesium oxide produced. Give your answer to three significant figures.

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Maximum mass = ..... g

- (ii) The teacher's demonstration produced 1.50 g of magnesium oxide. Use your answer from part (b)(i) to calculate the percentage yield. If you could not answer part (b)(i), use 1.82 g as the maximum mass of magnesium oxide. This is **not** the answer to part (b)(i).

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Percentage yield = ..... %

- (iii) Give 3 reasons why the percentage yield is less than 100%.

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