

Complete the table.

Figure number	Formula for the compound	Common name for the compound	Phase of the compound
Figure 1	H_2O	WATER	L
Figure 2	MgO	MAGNESIUM OXIDE	S
Figure 3	CO_2	CARBON DIOXIDE	G
Figure 4	NH_3	AMMONIA	G
Figure 5	HCl	HYDROGEN CHLORIDE	G
Figure 6	$CaCO_3$	CALCIUM CARBONATE	S

3.4 Rules for making models of molecules:

- Always make four or more molecules.
- Indicate the phase of the compounds by the spaces between the particles.

Activity 5

1. Use the key below to draw pictures of the different molecules in (a) to (d)

(do this in your workbook)

a) Li_2O

b) $2HCl$

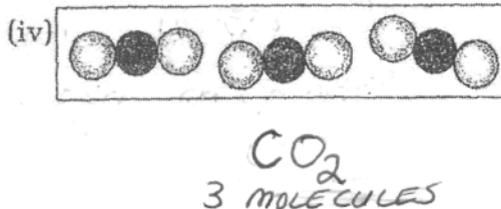
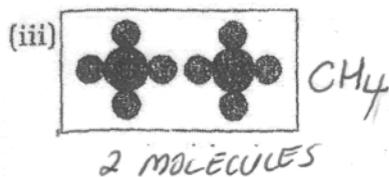
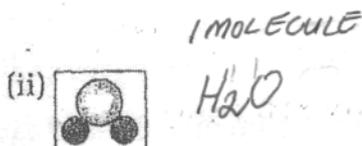
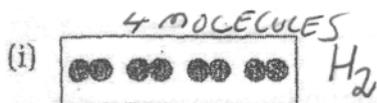
c) $2CH_4$

d) $3CuCl_2$

Key O — ● Cl — ● H — ● Ca — ● C — ● Na — ● Li — ● Cu — ●

2. Write the formulae for the following compounds

(Use the same key as in 1.)



4. Naming Compounds

To make it easy to know which elements are in a compound, scientists gave them names that follow certain rules. If you understand these rules, the name of the compound will tell you which elements are in the molecule. It will also help you to work out the name of the compound from the formula.

4.1 Rules to help you:

- The element which is first in the formula is usually given its full name. This element is often a metal or hydrogen.
- If there are only **two** elements in the formula, the name of the second element is changed to **-ide**, e.g. sulphur is sulphide, oxygen is oxide, nitrogen is nitride.
- If the formula ends on **-OH** the name ends on hydroxide.
- If there are **three** elements and the last element is oxygen, the name of the element just before the oxygen is changed so that it ends in **-ate** or **-ite**. Whether it is **-ate** or **-ite** depends on the number of oxygen atoms.
- Some exceptions: NH_4 —at the start of a formula is called ammonium, but NH_3 is called ammonia. H_2O is water. CH_4 is methane. HCO_3 and HSO_4 at the end of a formula are called hydrogen carbonate and hydrogen sulphate.

Activity 6 Name the following compounds:

HCl	Hydrogen Chloride
Na_2S	Sodium Sulphate
K_2O	Potassium Oxide
CaSO_4	Calcium Sulphate
AlN	Aluminium Nitride
NaHSO_4	Sodium Hydrogen Sulphate
NH_4Cl	Ammonium Chloride
$\text{Mg}(\text{NO}_3)_2$	Magnesium Nitrate
$\text{Ca}(\text{NO}_2)_2$	Calcium Nitrite

MgSO ₃	MAGNESIUM SULPHITE
NH ₃	AMMONIA
NaOH	SODIUM HYDROXIDE

4.2 Writing formulae

Every element has its own symbol, which consists of one or two letters, The first letter is always a capital letter and the second letter is always a small letter.

A compound is represented by a chemical formula e.g. FeS .

Charges/Valency on certain ions

Na⁺ Li⁺ K⁺ Mg²⁺ Ca²⁺ Cu²⁺ Zn²⁺ Al³⁺ C⁴⁺

F⁻ Cl⁻ Br⁻ O²⁻ S²⁻ N³⁻ P³⁻

Activity 7

Write the formula for the following:

A	Sodium chloride	NaCl	I	Aluminium nitride	AlN
B	Sodium oxide	Na ₂ O	J	Copper chloride	CuCl ₂
C	Sodium nitride	Na ₃ N	K	Zinc bromide	ZnBr ₂
D	magnesium chloride	MgCl ₂	L	Zinc sulphide	ZnS
E	magnesium oxide	MgO	M	Potassium nitride	K ₃ N
F	Magnesium nitride	Mg ₃ N ₂	N	Carbon tetra chloride	CCl ₄
G	Aluminium chloride	AlCl ₃	O	Hydrogen chloride	HCl
H	Aluminium oxide	Al ₂ O ₃	P	Hydrogen sulphide	H ₂ S

4.3 Here are formulae of compounds you may know

Formula	Name	Common name
NaCl	Sodium chloride	table salt
H ₂ O	Water	water
CaCO ₃	Calcium Carbonate	chalk
NaHCO ₃	Sodium hydrogencarbonate	baking soda
Fe ₂ O ₃	Iron(III) oxide	rust
HCl	Hydrogen chloride	spirits of salts
CH ₃ COOH	Ethanoic Acid	acetic acid/vinegar
H ₂ SO ₄	Hydrogen sulphate	battery acid

NaOH	Sodium hydroxide	caustic soda
C ₆ H ₁₂ O ₆	sucrose	sugar
KMnO ₄	Potassium permanganate	Condy's Crystals

5. Chemical Equations:

5.1 Chemical equations show what happens when a chemical reaction occurs.

A chemical reaction occurs when two or more substances join together to form a new substance with new properties.

properties.

The substances that you start with and which react together are called the reactants. They are shown on the left hand side of the equation.

The substances made in the reaction are the products. They appear on the right hand side of the equation.

Magnesium + oxygen → magnesium oxide

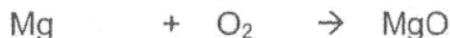
left hand side

right hand side

reactants

products

5.2 Equations can also be written using symbols and formulae:



In a chemical reaction you can not create or destroy atoms.

5.3 The number and type of reactant atoms must be the same as the number and type of the product atoms.

This means that in the chemical equation the left-hand side and the right-hand side need to balance.

A balanced equation shows the smallest number of molecules and atoms needed for the reaction to occur.



5.4 Tips for balancing:

Always start with the metals, then the non-metals, then the hydrogen and last the oxygen.