

SCIENCE (Chemistry)

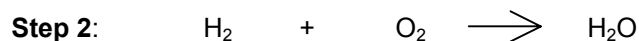
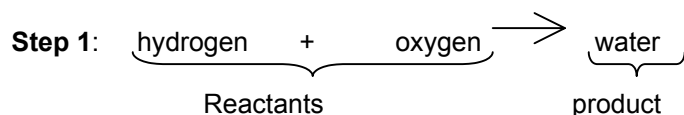
Chemical Calculations Using Mole (III) - Revision For Balancing Equation

Name: _____ () Class: _____ Date: _____

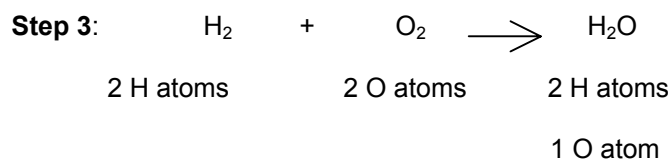
Revision Notes

1) Example 1: **Reaction between Hydrogen gas and Oxygen gas**

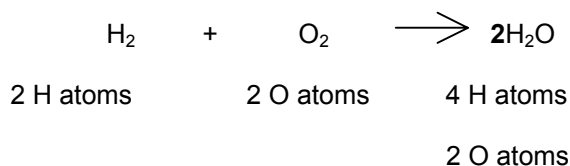
Hydrogen gas burns in oxygen gas to produce water (steam).



Check to see if the number of atoms of each element is the same on both side:

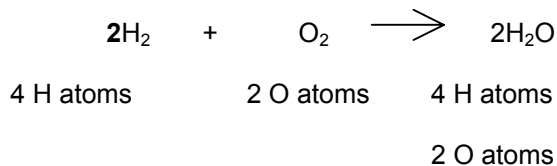


Adding a "2" in front of H₂O will give the following:

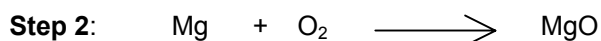
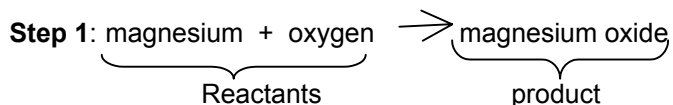


As the equation is still not balanced, a "2" has to be added in front of H₂ to get 4 H atoms on each side. The

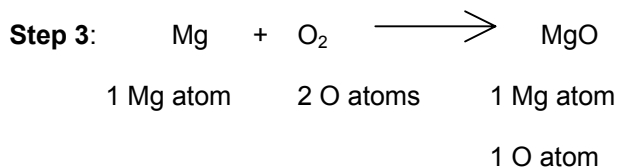
balanced equation is:



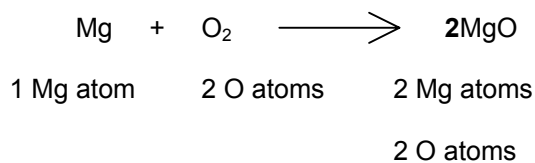
2) Example 2: **Burning of magnesium in air**



Check to see if the number of atoms of each element is the same on both side:

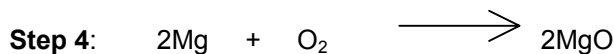
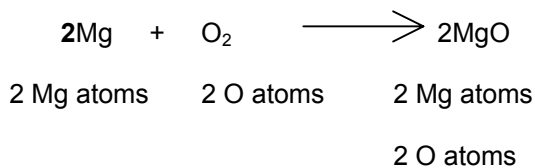


Adding a "2" in front of MgO will give the following:

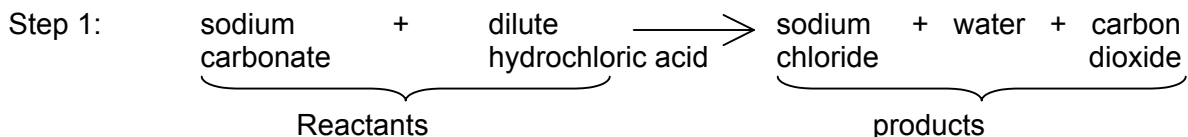


As the equation is still not balanced, a "2" has to be added in front of Mg to get 2 Mg atoms on each side.

The **balanced equation** is:



3) Example 3: **Reaction between sodium carbonate and dilute hydrochloric acid.**

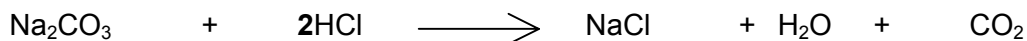


Check to see if the number of atoms of each element is the same on both side:



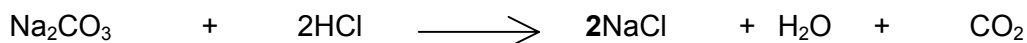
Atoms	LHS	RHS
Na	2	1
C	1	1
O	3	3
H	1	2
Cl	1	1

Since there are 2 hydrogen atoms on the right hand side, adding a "2" in front of **HCl** will give the following:

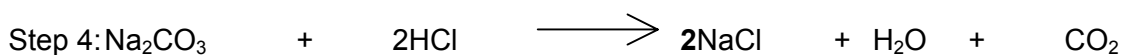


Atoms	LHS	RHS
Na	2	1
C	1	1
O	3	3
H	2	2
Cl	2	1

As the equation is still not balanced, a "2" has to be added in front of **NaCl** will balance the Na on the left hand side. The **balanced equation** is:



Atoms	LHS	RHS
Na	2	2
C	1	1
O	3	3
H	2	2
Cl	2	2



Exercise



1. Balance these chemical equations:

- a) $\text{H}_2 + \text{O}_2 \longrightarrow \text{H}_2\text{O}$
- b) $\text{H}_2 + \text{Cl}_2 \longrightarrow \text{HCl}$
- c) $\text{Zn} + \text{HCl} \longrightarrow \text{ZnCl}_2 + \text{H}_2$
- d) $\text{Na} + \text{H}_2\text{O} \longrightarrow \text{NaOH} + \text{H}_2$
- e) $\text{CH}_4 + \text{O}_2 \longrightarrow \text{CO}_2 + \text{H}_2\text{O}$
- f) $\text{Cu} + \text{O}_2 \longrightarrow \text{CuO}$
- g) $\text{N}_2 + \text{H}_2 \longrightarrow \text{NH}_3$
- h) $\text{K} + \text{HCl} \longrightarrow \text{KCl} + \text{H}_2$
- i) $\text{Cl}_2 + \text{KBr} \longrightarrow \text{KCl} + \text{Br}_2$
- j) $\text{Fe}_2\text{O}_3 + \text{CO} \longrightarrow \text{Fe} + \text{CO}_2$
- k) $\text{CuSO}_4 + \text{NaOH} \longrightarrow \text{Cu(OH)}_2 + \text{Na}_2\text{SO}_4$
- l) $\text{Mg} + \text{HNO}_3 \longrightarrow \text{Mg(NO}_3)_2 + \text{H}_2$
- m) $\text{Fe}_2\text{O}_3 + \text{Al} \longrightarrow \text{Al}_2\text{O}_3 + \text{Fe}$
- n) $\text{KOH} + \text{H}_2\text{SO}_4 \longrightarrow \text{K}_2\text{SO}_4 + \text{H}_2\text{O}$

2. By referring to the equations in question 1, complete the word equations below.

- a) Hydrogen + Oxygen \longrightarrow _____
- b) Hydrogen + _____ \longrightarrow _____
- c) Zinc + _____ \longrightarrow _____ + Hydrogen
- d) _____ + Water \longrightarrow _____ + Hydrogen
- e) _____ + Oxygen \longrightarrow _____ + Water
- f) _____ + Oxygen \longrightarrow _____
- g) Nitrogen + Hydrogen \longrightarrow _____

- h) Potassium + _____ → _____ + Hydrogen
- i) Chlorine + _____ → potassium chloride + _____
- j) _____ + _____ → Iron + _____
- k) Copper(II) Sulphate + Sodium hydroxide → _____ + _____
- l) Magnesium + _____ → _____ + Hydrogen
- m) _____ + Aluminium → _____ + Iron
- n) potassium hydroxide + _____ → _____ + Water