

S2 Topic 3b: Compounds, Reactions and Extractions

Compounds

- Compounds have different properties than the elements they are made up of.
- When two elements join together, the name ending of the second element changes to -ide.
- When three elements, one of which is oxygen, join together, the ending of the second element changes to -ite or -ate. Oxygen does not appear in the name of the compound.
- There is never any overall change in mass when a chemical reaction takes place. This is called Conservation of Mass.

Chemical Formula

The formula of magnesium bromide can be worked out using:

Symbol	Mg	Br
Valency	2	1
Swap	1	2
Divide	1	2
Formula	MgBr ₂	

Exothermic or endothermic?

- An exothermic reaction gives out energy to the surroundings.
- An endothermic reaction takes in energy from the surroundings.

Reactions of Metals

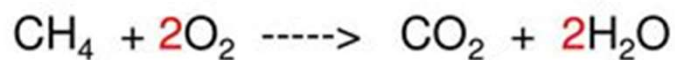
- Metals can be arranged in order of how they react with water, oxygen, and acids. This is called the Reactivity Series.
- Reactions of metals can be summarised using word equations.
- Alkali metals react violently with water to produce hydrogen gas and an alkali.
- Hydrogen gas burns with a pop.
- Metals above copper in the reactivity series react with dilute acid to produce hydrogen gas
- Very unreactive metals at the bottom of the reactivity series are found un-combined in nature.

Reactivity series of metals			
Most reactive ↑ Increasingly reactive ↓ Least reactive	K	Potassium	Extract by electrolysis
	Na	Sodium	
	Ca	Calcium	
	Mg	Magnesium	
	Al	Aluminium	
	C	Carbon	Extract by carbon reduction
	Zn	Zinc	
	Fe	Ferum	
	Sn	Tin	
	Pb	Lead	
	Cu	Copper	Heating directly in air
Least reactive	Hg	Mercury	
	Ag	Silver	
	Au	Gold	Found as natural element

Balancing Equations

When balancing an equation:

1. Only use big numbers in front of formulae
2. Don't split up formulae
3. Make sure there are the same number of atoms on each side of the arrow



Extraction of metals

- Metals can be extracted from their ores by heating alone (least reactive), heating with carbon or electrolysis (most).
- A blast furnace is used to extract iron from iron ore. Coke, iron ore and limestone are put in the top. The limestone helps to extract the impurities (slag).
- Electrolysis is used to separate a metal from its ore (compound), e.g. CuCl₂. The metal will form on the negative electrode (e.g. Cu). Often a gas will form on the positive electrode (e.g. Cl₂).