

Types of Chemical Change



<http://mrged.flexinet.com.au>


1. Synthesis Reactions
2. Decomposition reactions
3. Single replacement reactions
4. Double replacement reactions



1 Na reacts with 1 Cl
Formula = NaCl

Start

Ionic Bonding



Na

EN 0.9



Cl

EN 3.0

$$3.0 - 0.9 = 2.1$$

In chemistry there are millions of chemical reactions.
But most reactions can be classified as
one of four types of reactions:

Synthesis: $A + B \rightarrow AB$

Decomposition: $AB \rightarrow A + B$

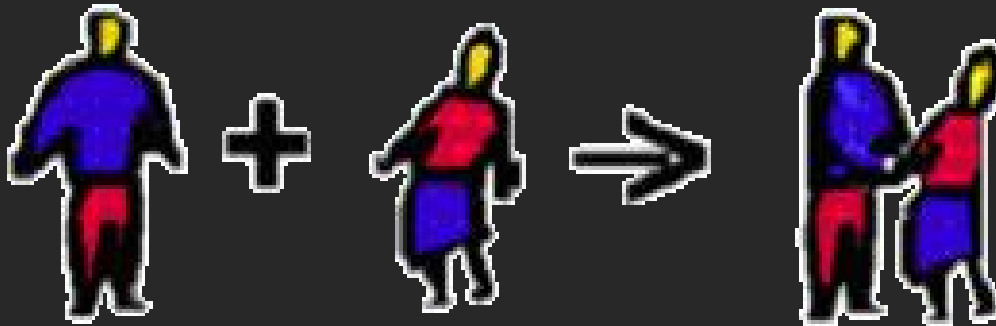
Single Replacement: $A + BC \rightarrow AC + B$

Double Replacement: $AB + CD \rightarrow AD + CB$



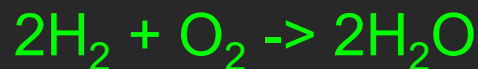
Synthesis (Composition)

In a synthesis reaction
(also known as a composition reaction),
two substances combine to form a larger substance.

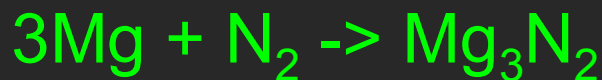


Here are 3 synthesis reactions:

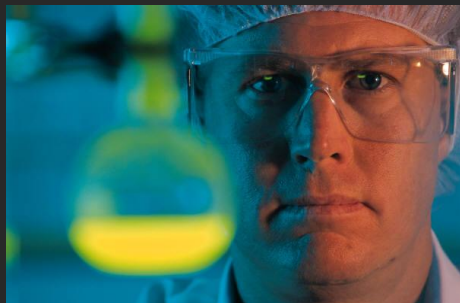
Hydrogen + oxygen yields water



Magnesium + nitrogen yields magnesium nitride

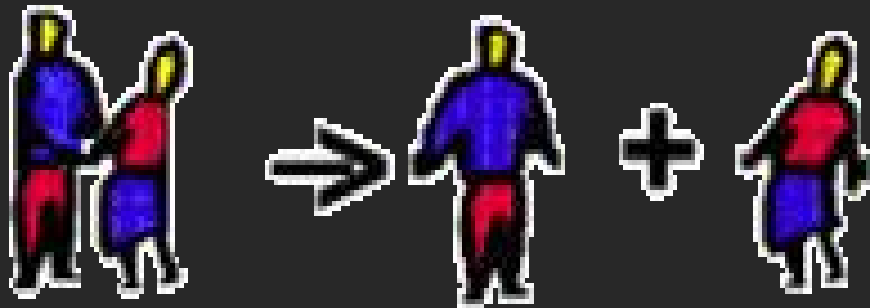
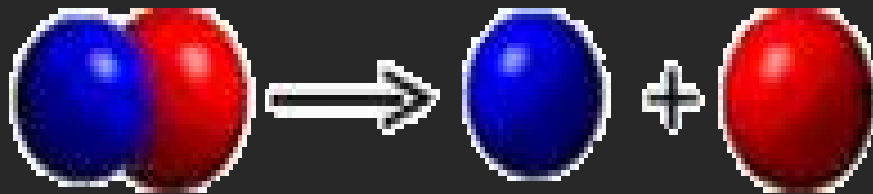


Iron + sulphur yields iron(II) sulphide



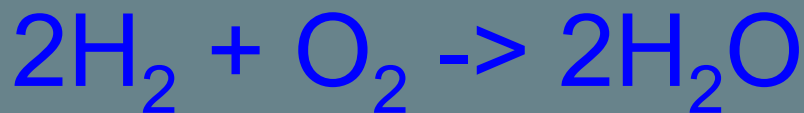
Decomposition

In a decomposition reaction, a larger substance breaks apart and forms two or more simpler substances.



The first thing you may notice about a decomposition reaction is that it is the complete opposite of a synthesis reaction. In fact many synthesis reactions can be reversed into a decomposition reaction.

When you burn hydrogen gas, the hydrogen combines with oxygen to produce water.



With an electrical current, water can be decomposed into hydrogen and oxygen gas.



Some examples of decomposition

Heat copper carbonate and it will decompose
(Refer to flash animation .swf)



(Most carbonates decompose producing the oxide and carbon dioxide)

Heat lead(II) hydroxide and it will decompose



Cue Film

The logo features the iconic Dolby 'DD' symbol on the left, consisting of two interlocking 'D' shapes. To the right of this symbol, the word 'DOLBY' is written in a bold, sans-serif font, enclosed within a rectangular border. Below this, the word 'DIGITAL' is written in a similar bold, sans-serif font, with each letter spaced out.

DOLBY
D I G I T A L

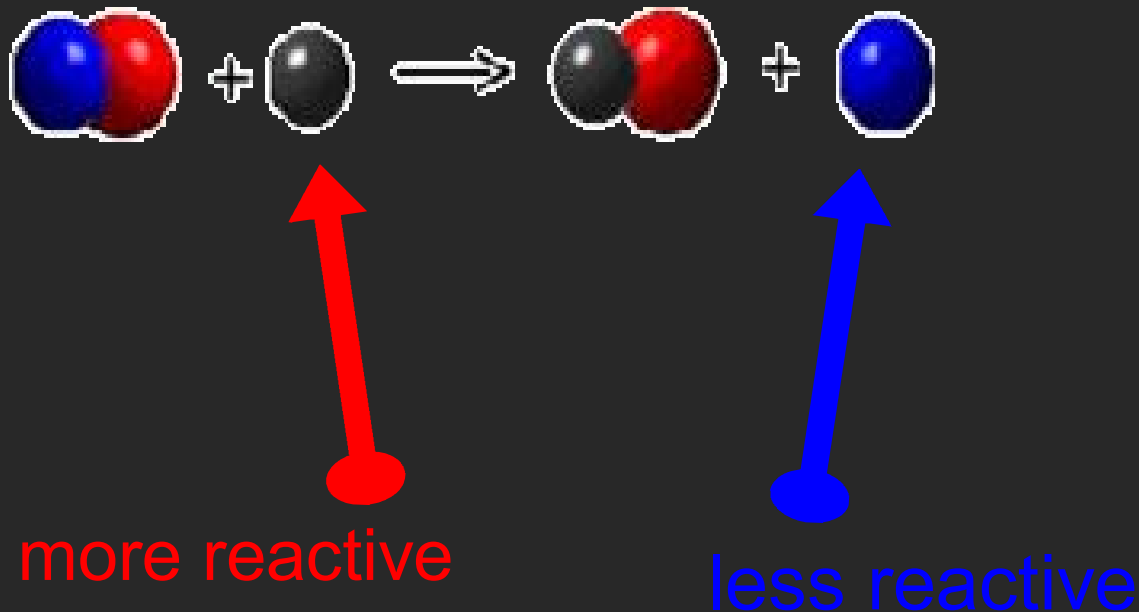
TRY THESE:

1. Watch all 12 mov files (available on SET drive)
2. Classify each as either, synthesis, decomposition, single or double replacement reactions
3. Write a correct chemical equation for each!
Some may require some research



Single Replacement

In a single replacement reaction, a more active element replaces a less active element in a compound.

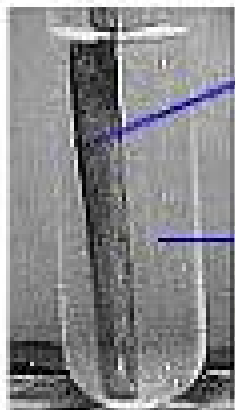


Single Replacement

Reactants

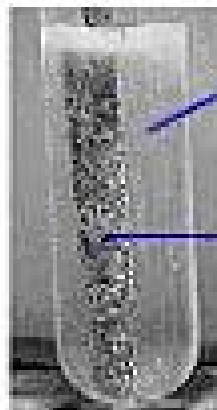


Products



Magnesium metal

Lead(II) nitrate solution



Magnesium nitrate solution

Lead metal

Here Mg is more reactive than Pb

Single Replacement

If fluorine gas is bubbled through a solution of potassium chloride, the fluorine will replace the chlorine.

This reaction can be represented as follows;



this equation has not been represented correctly here! Can you spot the errors?

No surprise! fluorine is more reactive than chlorine