# **Chemical Equations**

### Reactions of the alkali metals with air

Alkali metals react with air and quickly lose their shine to form a metal oxide.



	thium					
lithium + oxyg	n $\rightarrow$ lithium oxide					
4Li +	$O_2 \rightarrow 2Li_2O$					
sodium						
sodium + oxyg	en → sodium oxide					
4Na +	$O_2 \rightarrow 2Na_2O$					

### Reactions of the alkali metals with water

(Word equation only is necessary)
Alkali metals react vigorously with water.



lithium					
lithium + water	→ lithium hydroxide + hydrogen				
sodium					
sodium + water	→ sodium hydroxide + hydrogen				

#### Reaction between zinc and HCl

Zinc + hydrochloric acid 
$$\rightarrow$$
 zinc chloride + hydrogen

Zn + 2HCl  $\rightarrow$  ZnCl<sub>2</sub> + H<sub>2</sub>

#### Neutralisation

The properties of an acid are counteracted or neutralised by a base; this type of reaction is called a neutralisation reaction.

When an acid reacts with a base the hydrogen in the acid is replaced by a metal and a salt is formed

Sodium and calcium are examples of metals

General formula to represent neutralisation reaction:

Acid	+	Base	$\rightarrow$	Salt	+	Water
Example 1 hydrochloric acid HCL	+	sodium hydroxide NaOH	<i>→</i>	sodium chloride NaCl	+ +	Water H₂O
Example 2 hydrochloric acid 2HCl	+ +	calcium carbonate CaCO <sub>3</sub>	$\begin{array}{c} \rightarrow \\ \rightarrow \end{array}$	calcium chloride CaCl <sub>2</sub> +		) <sub>2</sub> + Water H₂O

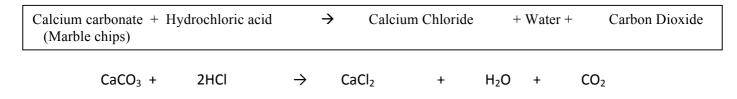
## **Preparation of oxygen**

Hydrogen peroxide 
$$\rightarrow$$
 oxygen + water

 $H_2O_2 \rightarrow O_2 + H_2O$ 

Manganese dioxide (MnO<sub>2</sub>) is added in as a catalyst (to speed up the reaction)

#### Preparation of carbon dioxide



#### Limewater and carbon dioxide

Limewater	+	carbon dioxide	$\rightarrow$	calcium car	rbonate	+	water
Ca(OH)₂	+	$CO_2$		$\rightarrow$	CaCo	O <sub>3</sub> +	H <sub>2</sub> O

## **Aerobic respiration**

# **Photosynthesis**

Carbon dioxide + water (+ sunlight and chlorophyll) → glucose + oxygen