

Year 10 Chemical Science Part 2

Revision – Chemical Reactions

Acids and Bases

1. Complete the following paragraphs

Acids are substances that contain hydrogen and when dissolved in water they release hydrogen ions (H^+). For example, HCl forms the H^+ and the Cl^- ions.

The pH is a measure of the acidity of a substance and pH stands for potential hydrogen. Acidic substances have a pH less than 7 and greater than or equal to 1.

A Base is a substance that releases the hydroxide ion (OH^-) when dissolved in water. A base that is dissolved in water is called an alkali. Metal hydroxides such as sodium hydroxide (NaOH) and metal oxides such as magnesium oxide (MgO) are bases as they release OH^- ions in solution.

Acid Reactions

2. Complete the following general acid reactions

Acid + base → salt + water

Acid + metal → salt + hydrogen gas

Acid + metal carbonate → salt + carbon dioxide + water

Acid + metal hydrogen carbonate → metal carbonate + carbon dioxide + water

3. Complete the following table

Acid	Chemical formula	Ions present	Type of Salt formed
Hydrochloric	<u>HCl</u>	H^+ , Cl^-	chloride
<u>Sulfuric</u>	H_2SO_4	H^+ , SO_4^{2-}	<u>sulfate</u>
Nitric	<u>HNO_3</u>	H^+ , NO_3^-	<u>nitrate</u>
Ethanoic (acetic)	CH_3COOH	<u>H^+, CH_3COO^-</u>	<u>ethanoate (acetate)</u>
<u>Phosphoric</u>	H_3PO_4	H^+ , PO_4^{3-}	<u>phosphate</u>
Carbonic	<u>H_2CO_3</u>	H^+ , CO_3^{2-}	<u>carbonate</u>

Decomposition Reactions

4. Complete the sentence and general reactions below.

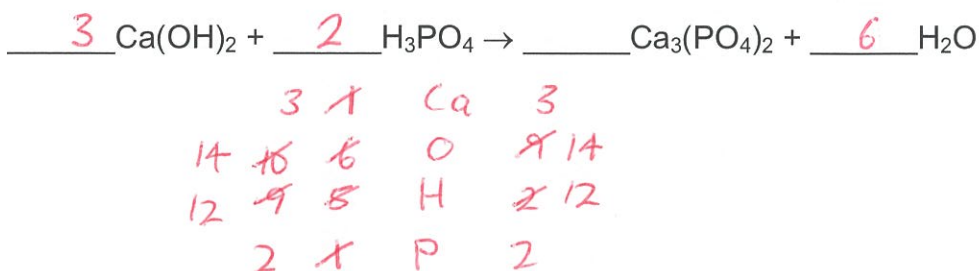
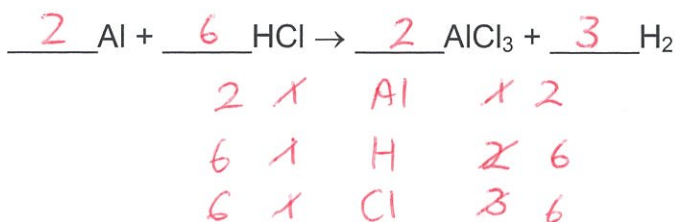
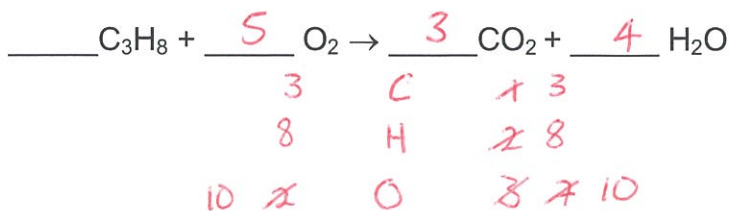
When metal carbonates and metal hydrogen carbonates are heated they decompose.

Metal hydrogen carbonate $\xrightarrow{\text{heat}}$ metal carbonate + water + carbon dioxide

Metal carbonate $\xrightarrow{\text{heat}}$ metal oxide + carbon dioxide

Balancing Equations

5. Balance the following equations



6. Write balanced chemical equations from the following word equations

Ammonium carbonate + nitric acid \rightarrow ammonium nitrate + carbon dioxide + water



Sodium + sulfuric acid \rightarrow sodium sulfate + hydrogen gas



Zinc carbonate $\xrightarrow{\text{heat}}$ zinc oxide + carbon dioxide



7. Predict the products and write balanced chemical equations from the given reactants

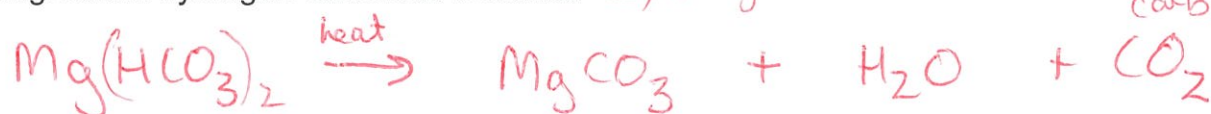
Hydrochloric acid and zinc \rightarrow hydrogen gas and zinc chloride.



Sodium carbonate and hydrochloric acid \rightarrow sodium chloride, carbon dioxide and water



Magnesium hydrogen carbonate is heated \rightarrow magnesium carbonate, water and carbon dioxide.



8. Predict the reactants and write balanced chemical equations from the following products.

\rightarrow calcium chloride and water



\rightarrow copper (II) phosphate and hydrogen gas



\rightarrow zinc ethanoate and carbon dioxide and water

