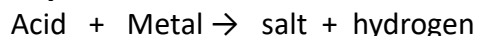




Box 1: Keywords

Word	Definition
Acids	Substances which dissolve in water to form solutions with a pH of less than 7.
Bases	Metal oxides or metal hydroxides
Alkalis	Soluble bases which dissolve in water to form solutions with a pH of more than 7.
Oxidation	A reaction in which a substance loses electrons (gains oxygen)
reduction	A reaction in which a substance gains electrons (loses oxygen)
salt	Compounds formed when the hydrogen ions in an acid has been replaced by metal ions

Box 2: Acid equations



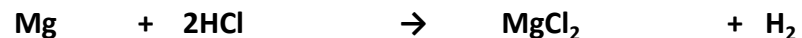
Box 3: Key skills

- Use appropriate apparatus and techniques to produce a pure dry soluble salt
- Predict products of acid reactions from given reactants
- Use formula of common ions to deduce the formula of salts
- Explain redox reactions in terms of loss or gain of electrons (HT only)

Box 4: The reactions of acids with metals

Metals react with acids to produce a salt and hydrogen

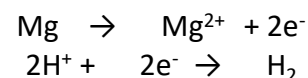
Magnesium + hydrochloric acid → magnesium chloride + hydrogen



Metals such as copper that are below hydrogen in the reactivity series do not react with acids

Redox reactions (HT only)

When metals react with acids the metal is oxidised and hydrogen is reduced.

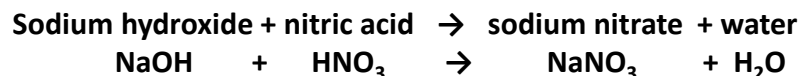
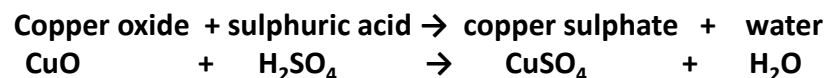


Box 5: The reaction of acids with bases and metal carbonates

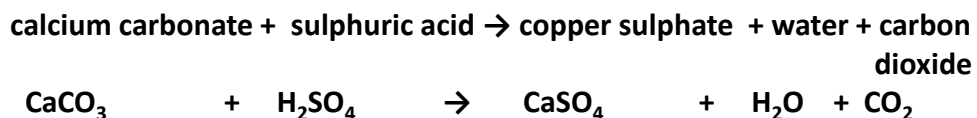
Bases are metal hydroxides and metal oxides.

Soluble metal hydroxides are also known as alkalis

Acids react with bases in a neutralisation reaction to produce a salt and water



Acids react with metal carbonates to produce a salt, water and carbon dioxide



Key Observations: The solid metal or metal compound will disappear as it reacts and a soluble salt is formed. With metals and metal carbonates only, fizzing will be seen as a gas is produced

Box 4: Salts

Salts are compounds formed when the hydrogen ions in an acid has been replaced by metal ions.

Naming salts

The first part of the name comes from the metal or metal compound and the second part comes from the acid

Acid used	Salt produced
Hydrochloric	chlorides
Nitric	nitrates
Sulphuric	sulphates

Sodium hydroxide + hydrochloric acid → sodium chloride + water

Working out the formula of salts

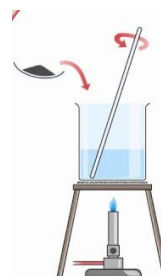
The formula can be worked out from the charges on the ions that make up the salt

Metal ion	Ion from Acid	Salt formula
Na ⁺	Cl ⁻	NaCl
Mg ²⁺	Cl ⁻	MgCl ₂
Cu ²⁺	SO ₄ ²⁻	CuSO ₄
Ca ²⁺	NO ₃ ⁻	Ca(NO ₃) ₂

Box 7: Cross curricular links

Box 5: Preparing a soluble salt (Required Practical)

1. React acid with an **excess** of metal oxide or metal carbonate



2. **Filter** the mixture to remove **unreacted** solid



3. Turn off the heat and leave until **all** the water has evaporated and salt crystals remain



3. **Gently** heat the solution to **evaporate** the water until **crystals** start to appear.

Box 6: Pathway

Previous knowledge: KS3 Acids, Alkalis and Neutralisation, KS4 Periodic table and structure and bonding

Future links: A Level Chemistry; Acids, bases and Buffers

Careers: Pharmacists, food scientist, environmental scientist, Cosmetic scientist, Quality controller

