

Edexcel IGCSE Chemistry

Topic 2: Inorganic chemistry

Acids, bases and salt preparations

Notes





2.34 know the general rules for predicting the solubility of ionic compounds in water:

type of salt	soluble	insoluble
sodium	all	
potassium	all	
ammonium	all	
nitrates	all	
chlorides	all except...	silver, lead
sulfates	all except...	lead, barium, calcium
carbonates	sodium, potassium, ammonium	...all except
hydroxides	sodium, potassium, ammonium	...all except

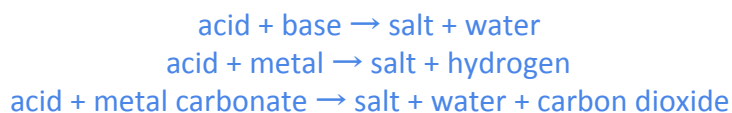
2.35 understand acids and bases in terms of proton transfer

- Acids donate protons (H⁺)
- Bases accept protons

2.36 understand that an acid is a proton donor and a base is a proton acceptor

- acids are proton donors
- bases are proton acceptors

2.37 describe the reactions of hydrochloric acid, sulfuric acid and nitric acid with metals, bases and metal carbonates (excluding the reactions between nitric acid and metals) to form salts





to form the formula of the salt formed:

- take the metal ion in the base/metal/carbonate e.g. Na^+
- take the ion part of the acid which isn't hydrogen
for $\text{HCl} = \text{Cl}^-$
for $\text{HNO}_3 = \text{NO}_3^-$
for $\text{H}_2\text{SO}_4 = \text{SO}_4^{2-}$
- balance the charges

Examples include:

- $\text{H}_2\text{SO}_4 + \text{MgO} \rightarrow \text{MgSO}_4 + \text{H}_2\text{O}$
- $\text{HNO}_3 + \text{NaOH} \rightarrow \text{NaNO}_3 + \text{H}_2\text{O}$
- $2\text{HCl} + 2\text{Na} \rightarrow 2\text{NaCl} + \text{H}_2$
- $\text{H}_2\text{SO}_4 + \text{Na}_2\text{CO}_3 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O} + \text{CO}_2$

2.38 know that metal oxides, metal hydroxides and ammonia can act as bases, and that alkalis are bases that are soluble in water

- $\text{HCl} + \text{NH}_3 \rightarrow \text{NH}_4\text{Cl}$ (example of the use of ammonia as a base)
- alkalis: bases which are soluble in water

2.39 describe an experiment to prepare a pure, dry sample of a soluble salt, starting from an insoluble reactant

- add excess insoluble base to the acid
- filter to remove unreacted base
- heat the solution so that water evaporates and crystals of the salt remain

2.40 (chemistry only) describe an experiment to prepare a pure, dry sample of a soluble salt, starting from an acid and alkali

- use a titration to find the exact volume of the alkali that reacts with the acid
- mix the exact volumes of the acid and base
- warm solution so that water evaporates and crystals of the salt remain

2.41 (chemistry only) describe an experiment to prepare a pure, dry sample of an insoluble salt, starting from two soluble reactants

- mix solutions of 2 soluble reactants
- filter mixture (insoluble salt will remain on filter paper)
- wash salt with distilled water
- leave salt to dry





2.42 practical: prepare a sample of pure, dry hydrated copper (II) sulfate crystals starting from copper (II) oxide

- copper oxide (base) is insoluble, so follow steps in 2.39

2.43 (chemistry only) practical: prepare a sample of pure, dry lead (II) sulfate

- lead sulfate is insoluble, so follow steps in 2.41.

