

# CAIE Chemistry IGCSE

## 7.3 Preparation of salts

### Flashcards

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Hydrochloric acid will form what type of salts?



Hydrochloric acid will form what type of salts?

Chloride salts, e.g. sodium chloride



Sulfuric acid will form what type of salts?



Sulfuric acid will form what type of salts?

Sulfate salts, e.g. magnesium sulfate



Nitric acid will form what type of salts?



Nitric acid will form what type of salts?

Nitrate salts, e.g. potassium nitrate



How can a soluble salt be prepared from an acid and soluble base?





# How can a soluble salt be prepared from an acid and soluble base?

- Use an acid/base titration to find the exact volume of base required for neutralisation of the acid.
- React the exact quantities of acid and base together without any indicator and collect the solution formed.
- Leave to dry in a warm place to evaporate the water. The salt crystals can be collected from the evaporating dish.



Suggest a method that could be used to produce sodium sulfate from sodium hydroxide and hydrochloric acid



Suggest a method that could be used to produce sodium sulfate from sodium hydroxide and hydrochloric acid

Titration



An insoluble base reacts with an acid to form a soluble salt. How can the salt be removed from the solution?



An insoluble base reacts with an acid to form a soluble salt. How can the salt be removed from the solution?

- Add excess base to the acid.
- Use filter paper and a funnel to remove any unreacted base.
- Keep in a warm place to evaporate the water.  
The salt crystals will be left behind.



How can an insoluble salt be collected from a reaction mixture?



## How can an insoluble salt be collected from a reaction mixture?

The insoluble salt is a precipitate so can be collected by filtration:

- Put filter paper in a funnel then place in a conical flask.
- Pour the reaction mixture into the funnel. Wash the salt with distilled water to wash away any solution.
- The salt crystals will be collected on the filter paper. Leave this to dry in a warm place before collecting the crystals.



# What type of salts are soluble?





## What type of salts are soluble?

- Nitrates
- Sodium, potassium and ammonium salts
- Chlorides (excluding lead and silver chloride)
- Sulfates (excluding barium, calcium and lead sulfate)



# What type of salts are insoluble?



## What type of salts are insoluble?

- Carbonates (excluding sodium, potassium and ammonium carbonate)
- Hydroxides (excluding sodium, potassium and ammonium hydroxide. Calcium hydroxide is partially soluble)



What does it mean when a chemical substance is hydrated?



What does it mean when a chemical substance is hydrated?

A hydrated substance is a substance that is chemically combined with water



What does it mean when a chemical substance is anhydrous?



What does it mean when a chemical substance is anhydrous?

An anhydrous substance is a substance that does not contain water



# How are insoluble salts prepared? (extended only)





## How are insoluble salts prepared? (extended only)

1. Dissolve two soluble salts in separate test tubes with water to form aqueous solutions
2. Once fully dissolved, add the two solutions into a beaker and stir, a precipitate (the insoluble salt) will form
3. Separate the precipitate from the mixture through filtration
4. The precipitate will collect in the filter paper, wash it with water to remove any excess solution on the surface before placing in the oven to dry



What reactants can be used to form the  
salt sodium nitrate?  
(extended only)



What reactants can be used to form the salt sodium nitrate? (**extended only**)

Any sodium salt

Any nitrate



What does 'water of crystallisation'  
mean?  
(extended only)



# What does 'water of crystallisation' mean? (extended only)

- Water of crystallisation refers to the water molecules that are present in hydrated crystals
- They are usually indicated by a black dot in the molecular formula
- E.g.  $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$  and  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

