

**MINISTRY OF EDUCATION**  
**SECONDARY ENGAGEMENT PROGRAMME**  
**GRADE 10**  
**CHEMISTRY**

**WEEK 12**

**LESSON 2**

**Topic:** Acids, Bases and Salts

**Sub-topic:** Preparation of Insoluble Salts

**Objective:** Given reactants or equations, students will correctly predict the insoluble formed.

**Content**

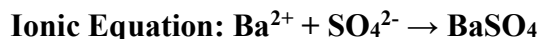
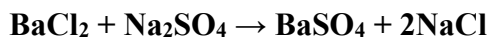
**What is an insoluble salt?**

**Insoluble salts** are ionic compounds that are **insoluble** in water: the **salt** continues to exist as a solid rather than dissolving in the liquid. These salt are prepared by the method of **precipitation**.

**Precipitation Method**

A precipitation reaction is a reaction between two soluble salts. The products of a precipitation reaction are two other salts, one of them is soluble and one is insoluble (precipitate).

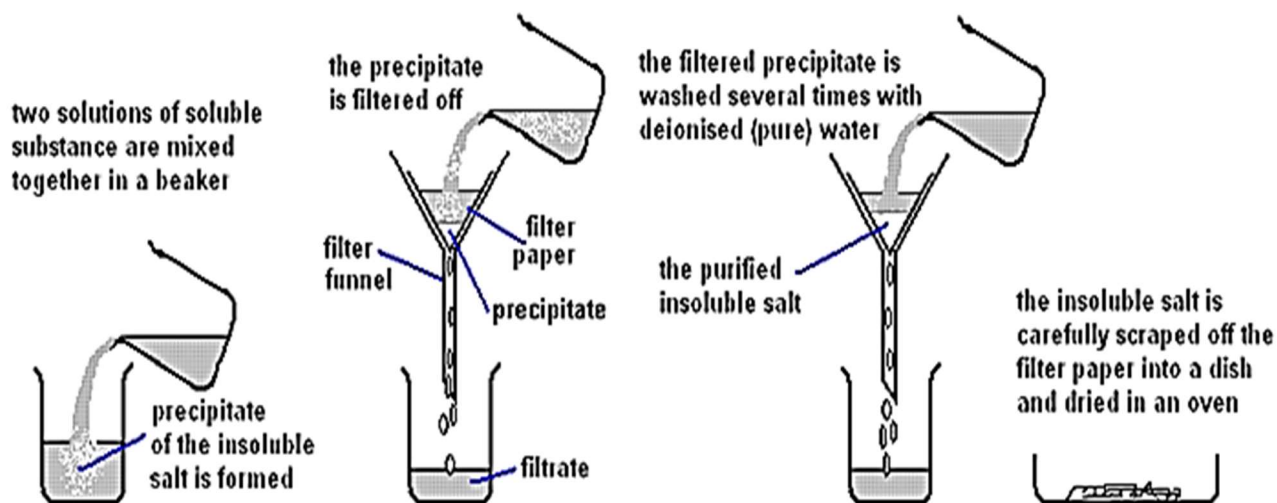
**Example:** To obtain barium sulfate salt given barium chloride and sodium sulfate:



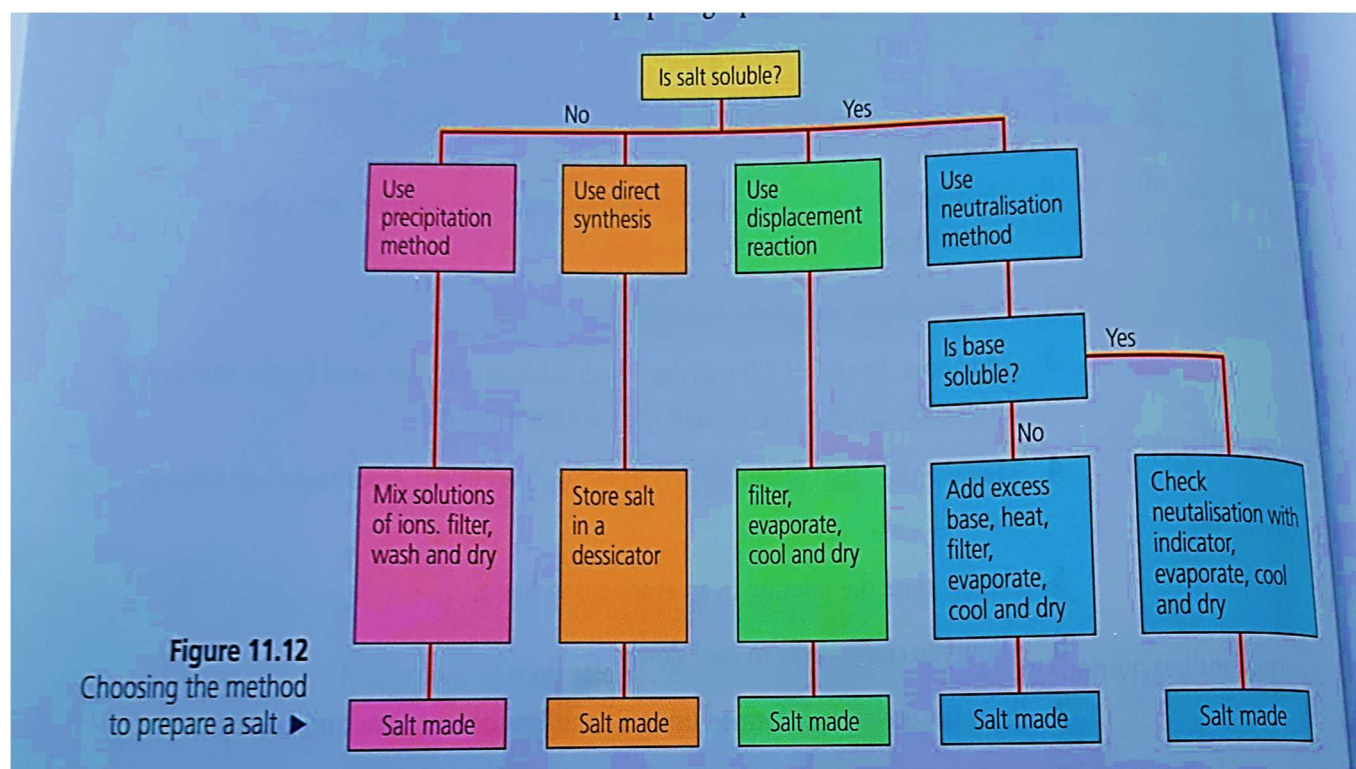
**Example:**  $\text{AgNO}_3(\text{aq}) + \text{NaCl}(\text{aq}) \rightarrow \text{NaNO}_3(\text{aq}) + \text{AgCl}(\text{s})$

The silver chloride appears as tiny particles suspended in the reaction mixture - this is the precipitate. The precipitate can be filtered, washed with water on the filter paper, and then dried in an oven.

## Steps to Preparing an Insoluble Salt



## Summary of Methods of Preparing Salts

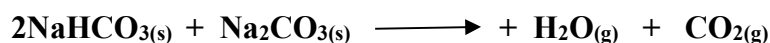


## Uses of Salts

### Baking Powder

Baking powder is a 'raising agent', which is used in making cakes, some bread, roti, and bake (fried flatbread). Baking powder is sodium hydrogencarbonate and also typically contains tartaric acid. When baking powder is added to the dough, the tartaric acid reacts with sodium hydrogencarbonate to form carbon dioxide gas, which causes the dough to rise.

The action of heat on sodium hydrogencarbonate also produces CO<sub>2</sub> gas. The reaction in the use of baking powder is:



### Uses and Dangers of Salts

Table 11.0 Uses and dangers of salts

Salt	Use	Mechanism of action	Comments including dangers
Sodium chloride (common salt) NaCl	Used to flavour foods, and to cure meats and fish	Anti-microbial, restricts bacterial growth, reduces the amount of available water, changes osmotic pressure	Linked to high blood pressure, hardens the flesh of meat and fish and decreases its ability to absorb water
Sodium nitrite (NaNO <sub>2</sub> ) Sodium nitrate (NaNO <sub>3</sub> )	Preserving heat-processed meat, poultry, fish and cheese	Controls the growth and toxin production of <i>Clostridium botulinum</i>	Nitrites produce nitric oxide, which gives a bright red colour to meats, they also combine with other products to produce nitrosamines, which can be the cause of some cancer in humans. Sodium nitrate may cause brain damage in infants and it is also suspected to be carcinogenic.
Sodium benzoate	Used in acidic foods such as salad dressings, carbonated drinks, jams and fruit juices, pickles and condiments, and medicines and cosmetics	Antimicrobial, mainly inhibits yeast and bacterial growth, effective only in acidic conditions (pH < 4)	Sodium benzoate can, in the presence of ascorbic acid, form benzene (a carcinogen).

## Homework

Explain how salts are used in the making of 'Cement' and 'Plaster of Paris'.

## Reference

1. <https://www.minichemistry.com/preparation-of-soluble-salts-insoluble-salts.html>
2. <https://study.com/academy/lesson/what-is-an-alkali-lesson-for-kids.html>
3. <http://www.docbrown.info/page03/AcidsBasesSalts06d.htm#:~:text=These%20compounds%20can%20be%20made,teacher%20in%20a%20fume%20cupboard.>