

## Salts

A salt is a compound formed by the reaction of an acid with a base in which the hydrogen of the acid is replaced by the metal.

### Types of Salts :

The different types of salts are: normal salt, acid salt, basic salt and double salt.

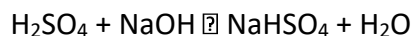
**1. Normal salt :** A salt that does not contain any replaceable hydrogen atoms or hydroxyl groups .

#### EXAMPLES

$\text{Na}_2\text{SO}_4$  obtained in the reaction between  $\text{H}_2\text{SO}_4$  and  $\text{NaOH}$  is a normal salt because it is formed by the complete replacement of both the H atoms of  $\text{H}_2\text{SO}_4$ ,

Similarly, calcium sulphate ( $\text{CaSO}_4$ ), sodium phosphate ( $\text{Na}_3\text{PO}_4$ ) and potassium phosphate ( $\text{K}_3\text{PO}_4$ ) are also normal salts.

**2. Acid salt :** When a polybasic acid is not completely neutralized by a base, the salt produced will contain replaceable hydrogen atoms. Hence, it may further take part in the reaction with the base as an acid. Such a salt is called an acid salt. For example, the salt  $\text{NaHSO}_4$  produced in the reaction between  $\text{NaOH}$  and  $\text{H}_2\text{SO}_4$  is an acid salt because it is capable of further reaction with the base  $\text{NaOH}$  to produce the normal salt  $\text{Na}_2\text{SO}_4$ .



Thus, an acid salt may be defined as follows.

A salt that contains replaceable hydrogen atoms is called an acid salt.

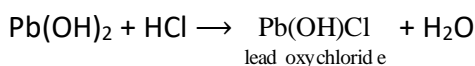
#### EXAMPLES :

$\text{NaHSO}_4$ ,  $\text{NaH}_2\text{PO}_4$  and  $\text{Na}_2\text{HPO}_4$  are examples of acid salts.

**3. Basic salt :** When a polyacidic base reacts with lesser amount of acid than is necessary for complete neutralization, the salt produced contain hydroxyl group(s) (OH) also. Such a salt is called a basic salt.

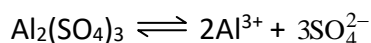
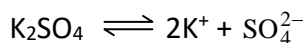
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1 mole of  $\text{Pb}(\text{OH})_2$  requires 2 moles of  $\text{HCl}$  for complete neutralization. But when 1 mole of  $\text{Pb}(\text{OH})_2$  is made to react with 1 mole of  $\text{HCl}$ , some  $\text{Pb}(\text{OH})_2$  is left unreacted. The salt produced is not  $\text{PbCl}_2$ , but  $\text{Pb}(\text{OH})\text{Cl}$ .



**4. Double salt :** In a double salt, there are two different negative ions and/or positive ions. For example, the mineral dolomite,  $\text{CaCO}_3 \cdot \text{MgCO}_3$ , contains both  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions. Hence, it is a double salt. Potash alum,  $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ , also is a double salt.

Double salts exist only in the solid state. When dissolved in water, they break up into a mixture of two separate salts. For example, when potash alum is dissolved in water, it breaks up as follows.



### Uses of Salts :

The following table lists uses of some salts.

Salts	Uses
Sodium chloride	<ol style="list-style-type: none"> <li>1. An essential requirement of our food</li> <li>2. In the preservation of food</li> <li>3. In curing fish and meat</li> <li>4. In making a freezing mixture which is used by icecream vendors</li> <li>5. In the manufacture of soaps</li> </ol>
Sodium carbonate	<ol style="list-style-type: none"> <li>1. As washing soda for cleaning clothes</li> <li>2. Used in the manufacture of glass, paper, textiles, caustic soda, etc.</li> <li>3. In the refining of petroleum</li> <li>4. In fire extinguishers</li> </ol>
Sodium bicarbonate	<ol style="list-style-type: none"> <li>1. Used as baking soda</li> <li>2. In fire extinguishers</li> <li>3. As an antacid in medicine</li> </ol>

Potassium nitrate	<ol style="list-style-type: none"> <li>1. To make gunpowder, fireworks and glass</li> <li>2. As a fertilizer in agriculture</li> </ol>
Copper sulphate	<ol style="list-style-type: none"> <li>1. Commonly called 'blue vitriol', used as a fungicide to kill certain germs</li> <li>2. In electroplating</li> <li>3. In dyeing</li> </ol>
Potash alum	<ol style="list-style-type: none"> <li>1. Used to purify water; makes suspended particles in water settle down</li> <li>2. As an antiseptic</li> <li>3. In dyeing</li> </ol>