

LESSON NOTES

Subject: Basic Science

Year/Level: 10

Week 26

Strand	2: MATTER
Sub Strand	2.3 : REACTIONS
Content Learning Outcome	Appreciate the various chemical reactions that are encountered daily

2.3.3 : TYPES OF CHEMICAL REACTIONS

During a chemical reaction atoms of one element do not change into those of another element. Nor do atoms disappear from the mixture or appear from elsewhere. Actually, chemical reactions involve the breaking and making of bonds between atoms to produce new substances.

1. Displacement Reaction (also known as single replacement)

- where a more reactive metal displaces a less reactive metal from a compound.
- In other words a metal higher up in the reactivity series will 'push out' a metal lower in the series.

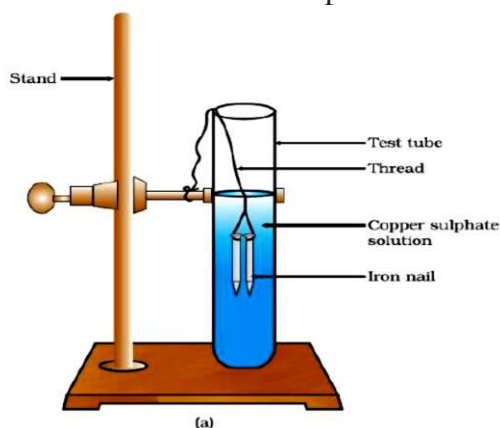
Activity

- Take three iron nails and clean them by rubbing with sand paper.
- Take two test tubes marked as (A) and (B).
- In each test tube, fill about 10 mL copper sulphate solution.
- Tie two iron nails with a thread and immerse them carefully in the copper sulphate solution in test tube B for about 20 minutes. Keep one iron nail aside for comparison.
- After 20 minutes, take out the iron nails from the copper sulphate solution.
- Compare the intensity of the blue colour of copper sulphate solutions in test tubes (A) and (B).
- Also, compare the colour of the iron nails dipped in the copper sulphate solution with the one kept aside.

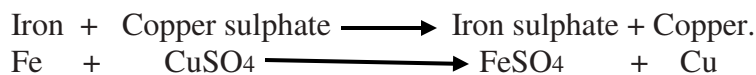
Result:

Why does the iron nail become brownish in colour and the blue colour of copper sulphate solution fade?

The reason why this happened is because iron is higher in the reactivity series so it 'takes' the sulphate from the copper to form iron sulphate... and copper.



- ❖ In this reaction, iron has displaced or removed another element, copper, from copper sulphate solution.
- ❖ This reaction is known as displacement reaction.



- ❖ Basically, the rule is:

If the pure metal is higher in the reactivity series than the metal in the compound, then displacement will happen

2. Precipitation (also known as double replacement)

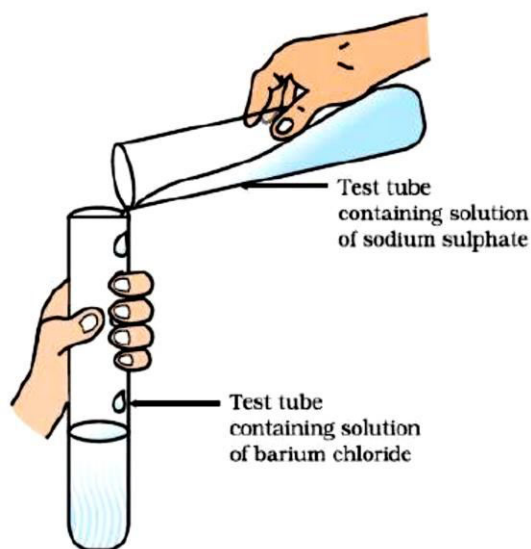
- Is a reaction in which the elements in two compounds are exchanged and form different compounds.
- When some solutions are mixed, an insoluble solid form as one of the products.
- The insoluble solid is called **precipitate**.
- Any reaction that produces a precipitate can be called a **precipitation reaction**.

Activity

- ❖ Take about 3 mL of sodium sulphate solution in a test tube.
- ❖ In another test tube, take about 3 mL of barium chloride solution. Mix the two solutions.



- ❖ As an analogy, imagine that AX and BY are partners. A and B switch partners, so B is now pairing with X and A is now pairing with Y.



ACTIVITY:

- 1) In displacement reaction, explain why the colour changes on the nail as well as in the copper sulphate solution?

- 2) Give another name for :

- a) Displacement reaction? _____
- b) Precipitation reaction? _____

...STAY SAFE...

