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Class - 10

Chapter - 1

Chemical Reactions and Equations

Part-5

TYPES OF CHEMICAL REACTIONS

Disha Didi (DD)

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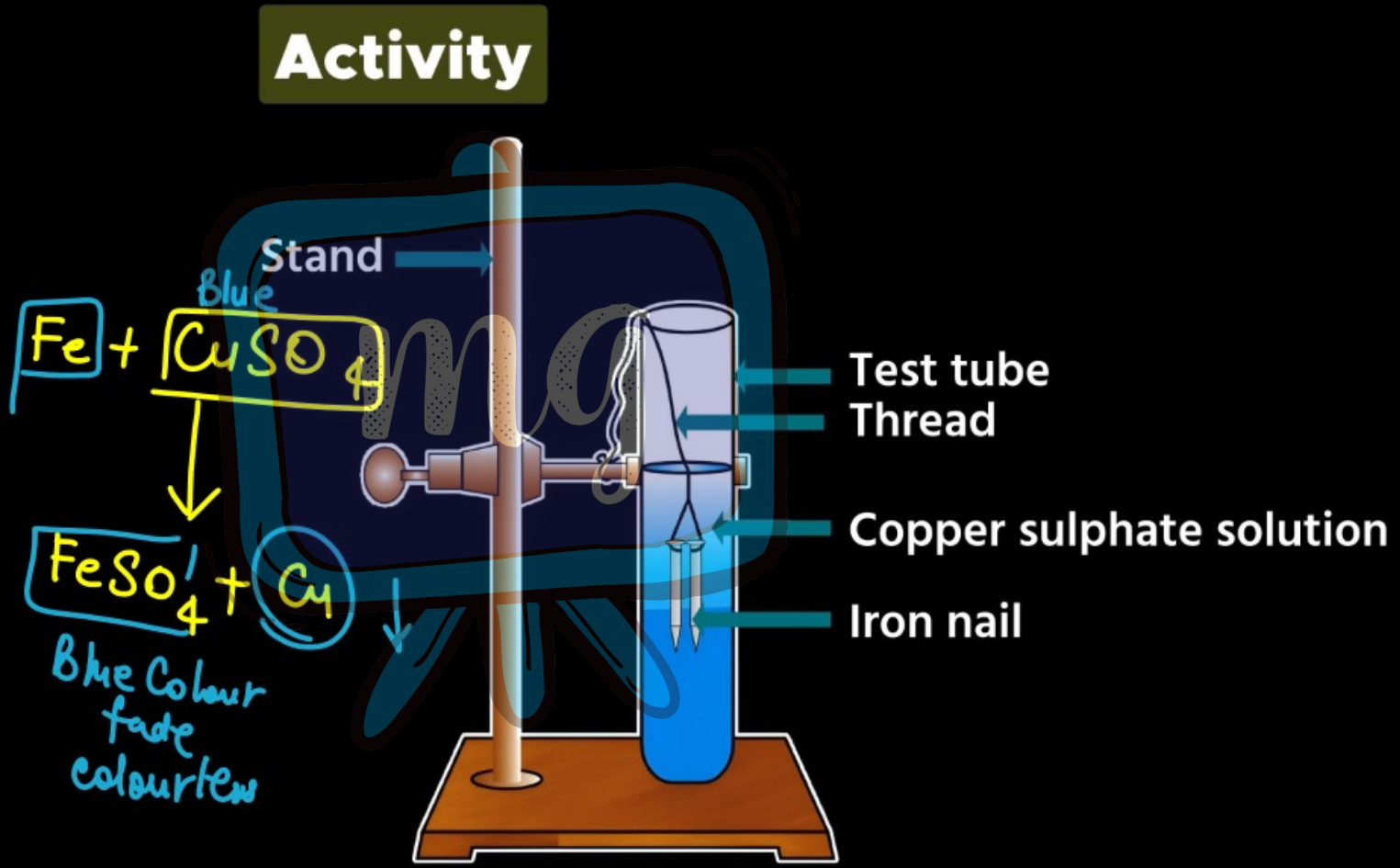
Displacement Reaction

- Chemical reaction in which a more reactive element displaces a less reactive element from its compound.
- Both metals and non-metals take part in displacement reactions.

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Activity



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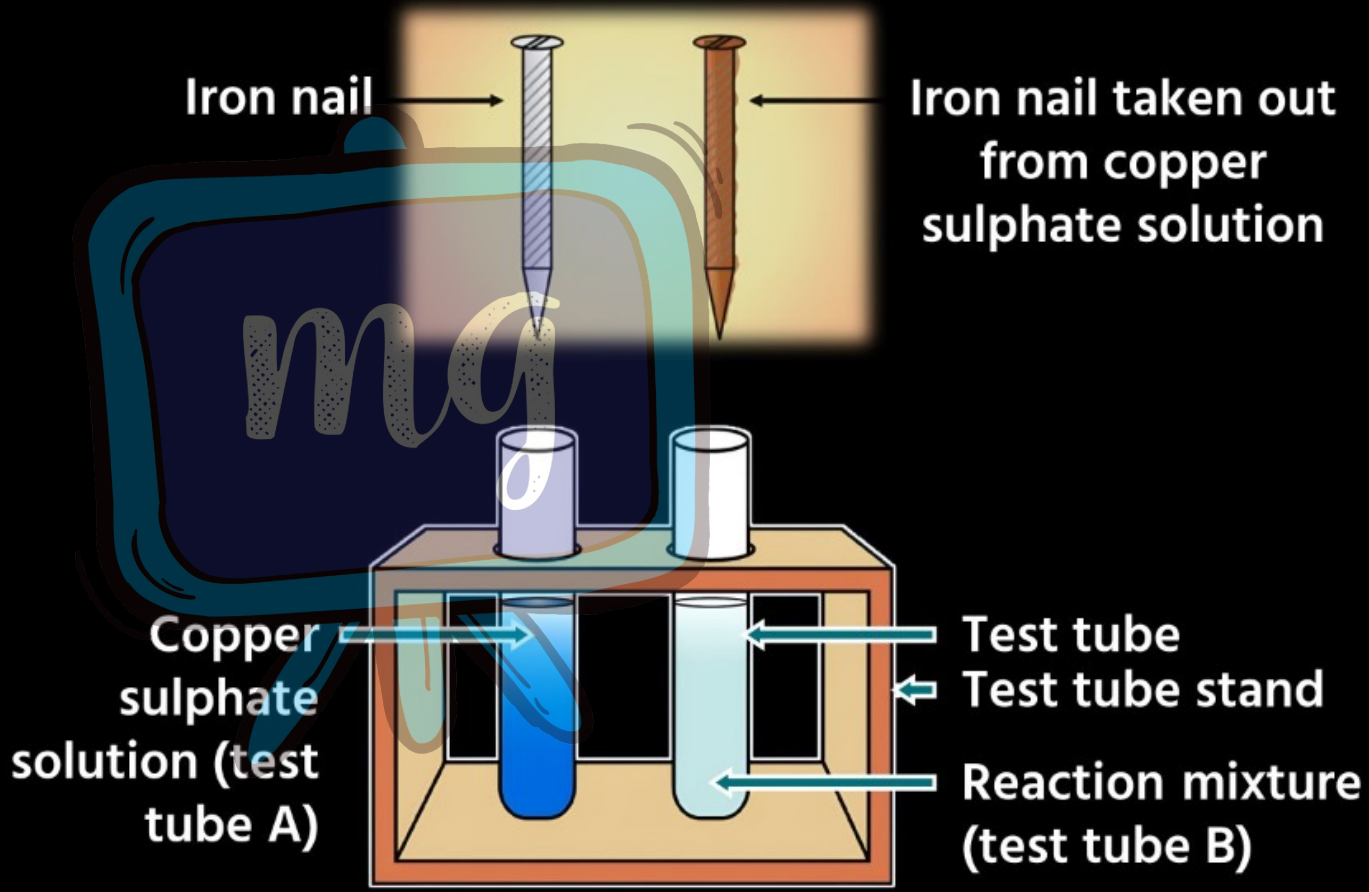
Observation :

- Iron nail become brownish in colour,
- The blue colour of copper sulphate solution fades.

$$Fe_{(s)} + \underset{\text{(Copper sulphate)}}{CuSO_{4(aq)}} \rightarrow \underset{\text{(Iron sulphate)}}{FeSO_{4(aq)}} + Cu_{(s)}$$

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A single displacement reaction is represented below.

$$PQ + R \rightarrow PR + Q$$

C Which of the following is true about the reactants and products?

Option	Type of ion of R in product	Stability of PR as compared to PQ
A	cation	more stable
B	cation	less stable
C	anion	more stable
D	Anion	less stable

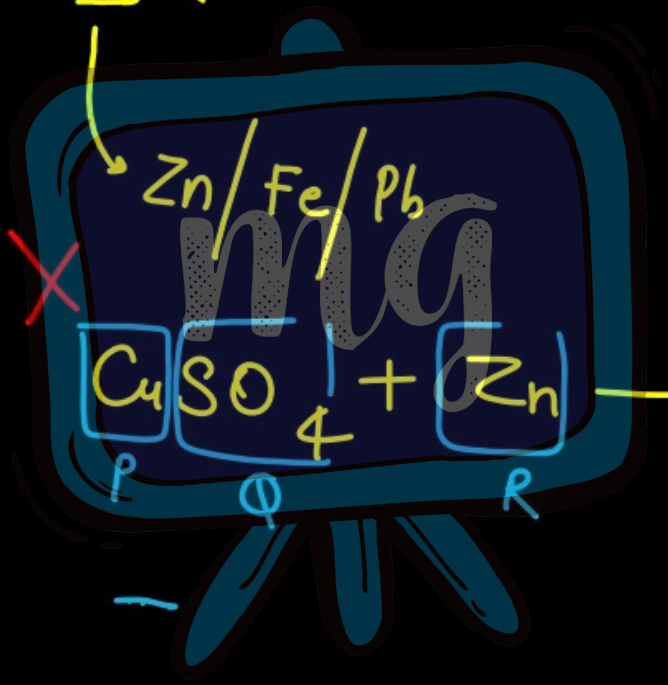
(A) A (B) B

(C) C (D) D

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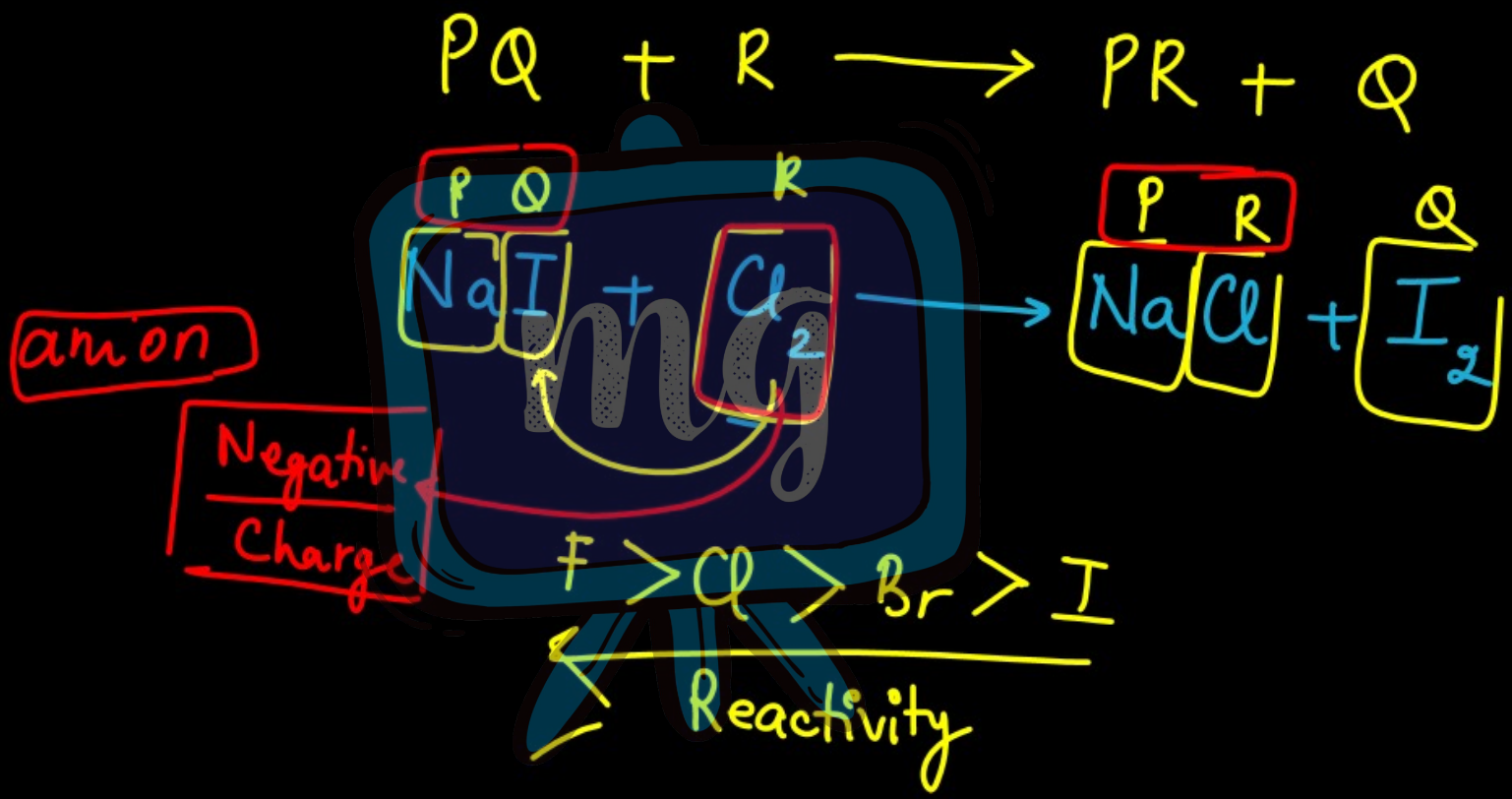
$PQ + R \longrightarrow PR + Q$



$\longrightarrow CuZn + SO_4^{-2}$

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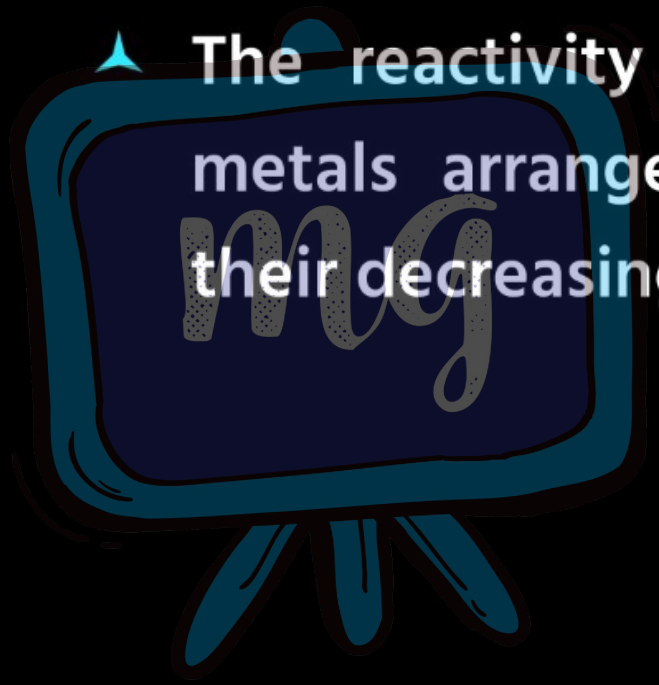


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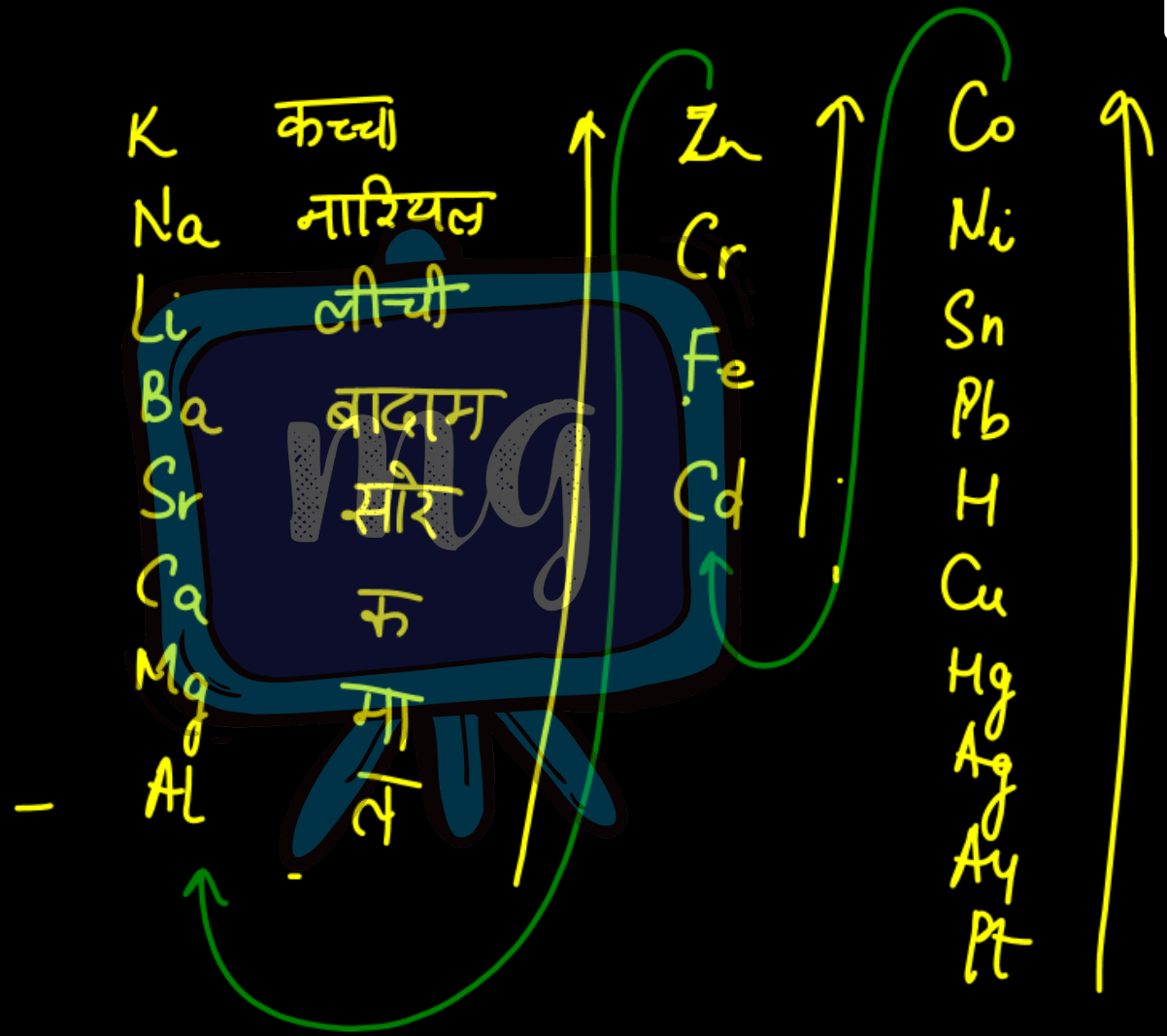
The Reactivity Series

- The reactivity series is a list of metals arranged in the order of their decreasing reactivity.



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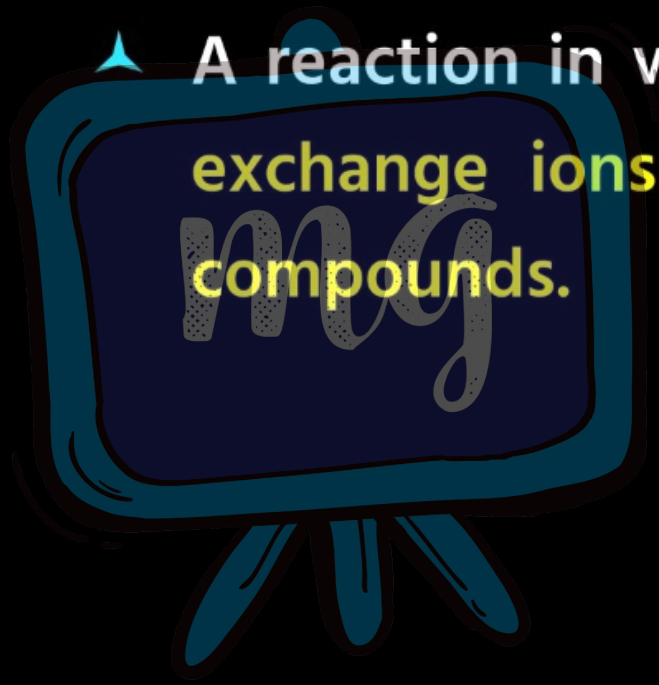


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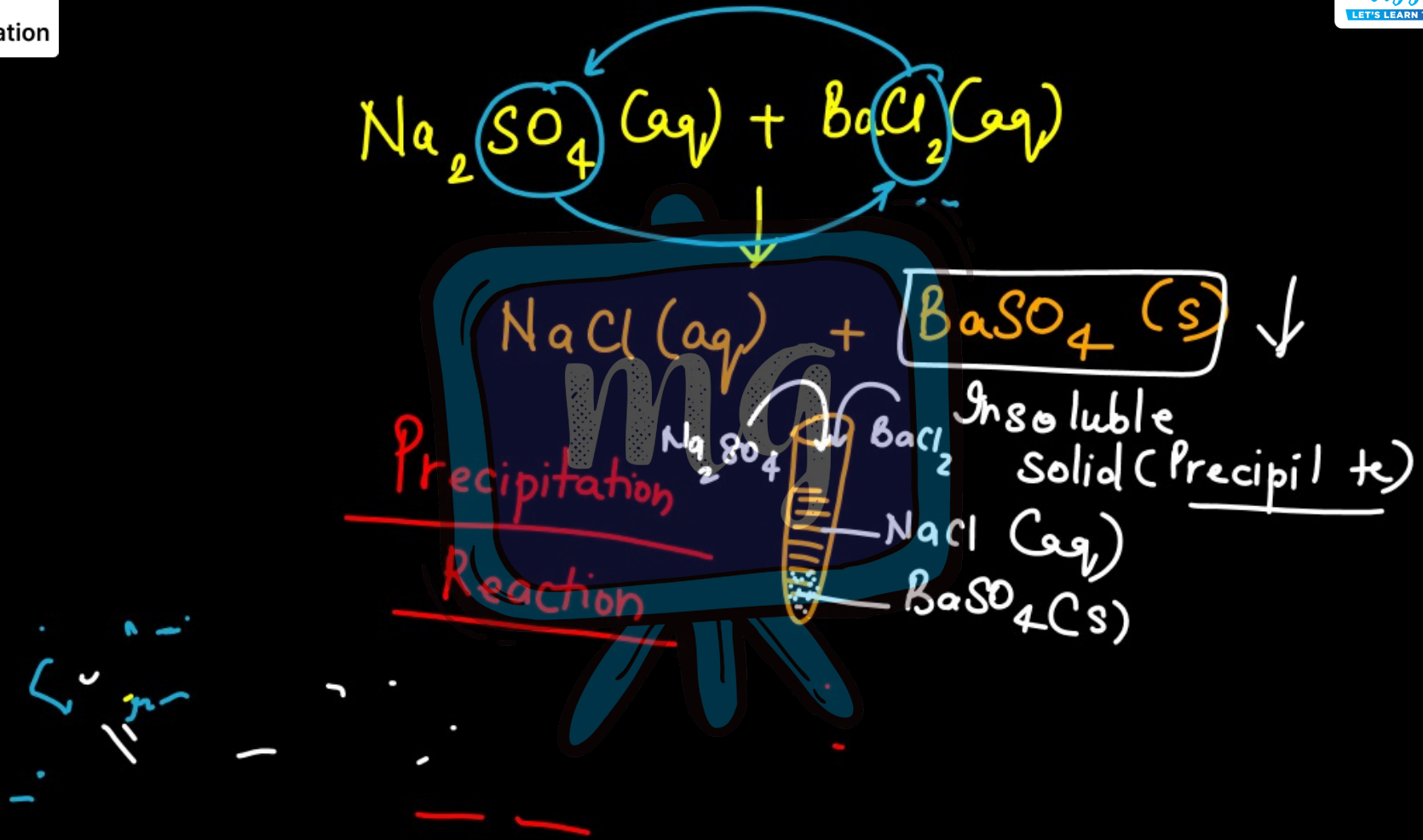
Double Displacement Reaction

- A reaction in which two reactants exchange ions to form two new compounds.



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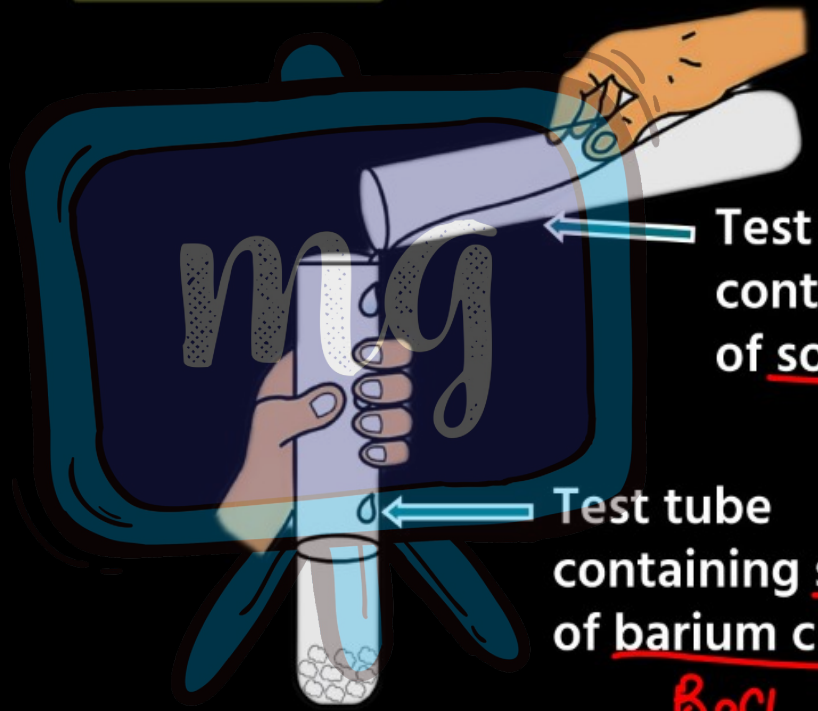
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Activity



Test tube containing solution of sodium sulphate

Na_2SO_4

Test tube containing solution of barium chloride

$BaCl_2$

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Observation :

- A white substance, $BaSO_4$, which is insoluble in water, is formed.
- Insoluble substance formed is known as a precipitate.

Note : Any reaction that produces a precipitate can be called a **precipitation reaction.**

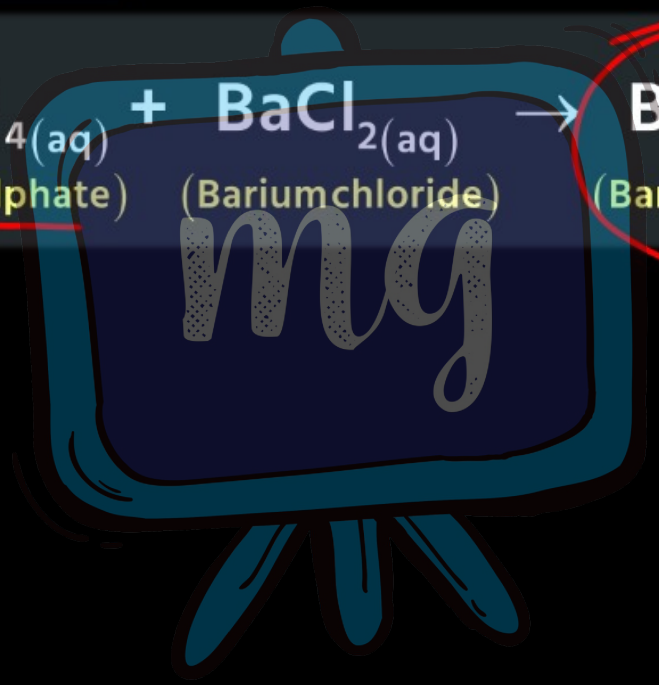
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Example :

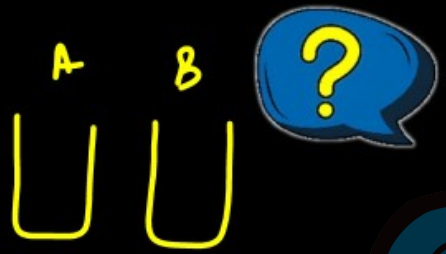
$$Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} + 2NaCl_{(aq)}$$

(Sodium sulphate) (Barium chloride) (Barium sulphate) (Sodium chloride)



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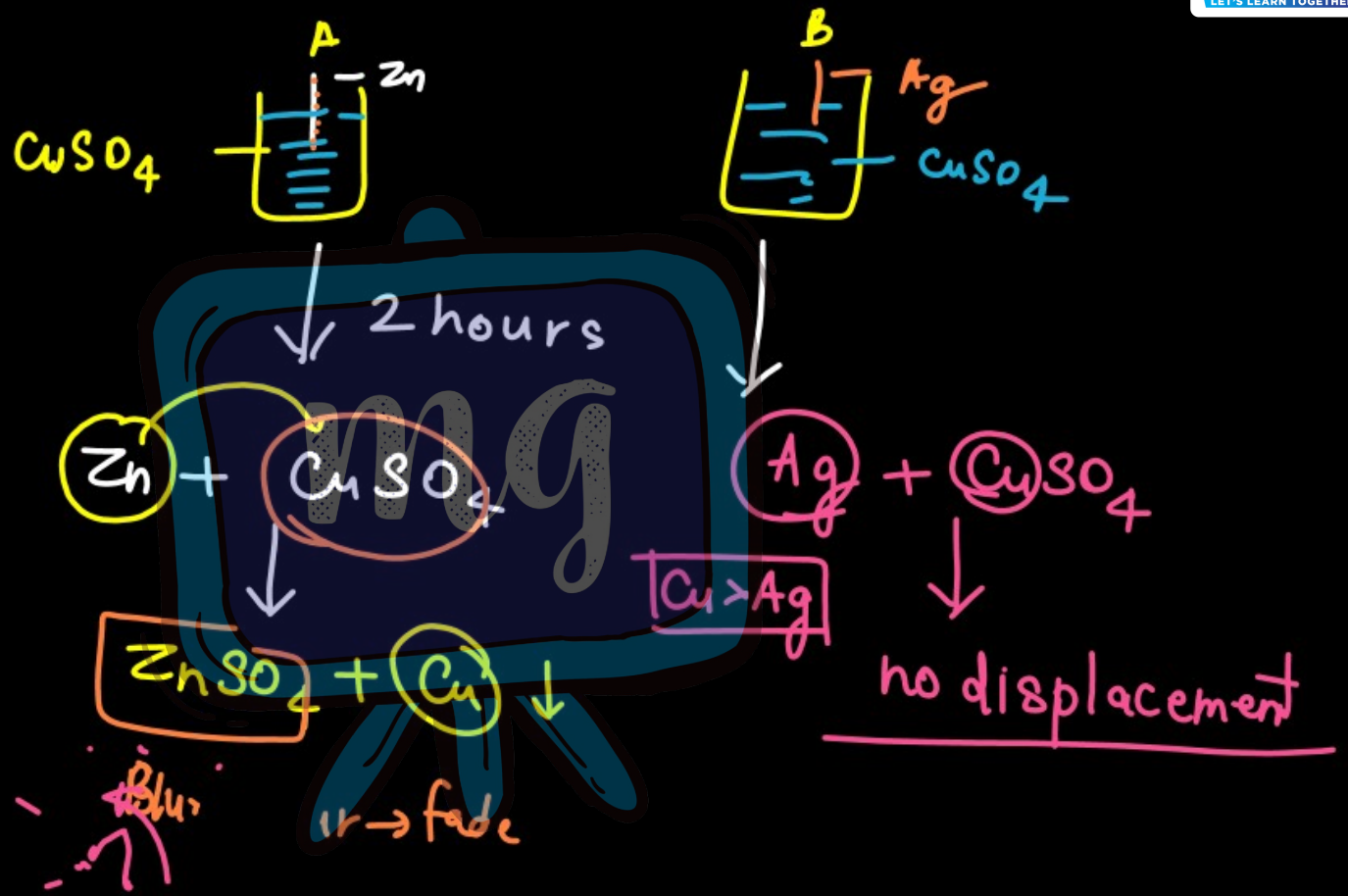
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You have two beakers 'A' and 'B' containing copper sulphate solution. What would you observe after about 2 hours if you dip a strip of zinc in beaker 'A' and a strip of silver in beaker 'B'? Give reason for your observations in each case.

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Translate the following statement into a balanced chemical equation. When barium chloride reacts with aluminium sulphate, aluminium chloride and barium sulphate are formed. State the type of this reaction giving reason to justify your answer.

$BaCl_2$ + $Al_2(SO_4)_3$ ↓

$BaSO_4$

$AlCl_3$

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$$3\,BaCl_2 + Al_2(SO_4)_3 \rightarrow 3\,BaSO_4 + 2\,AlCl_3$$

	LHS	RHS
Ba	1 x 3 = 3	1 x 3 = 3
Cl	2 x 3 = 6	3 x 2 = 6
Al	2	1 x 2 = 2
S	3	1 x 3 = 3
O	12	4 x 3 = 12

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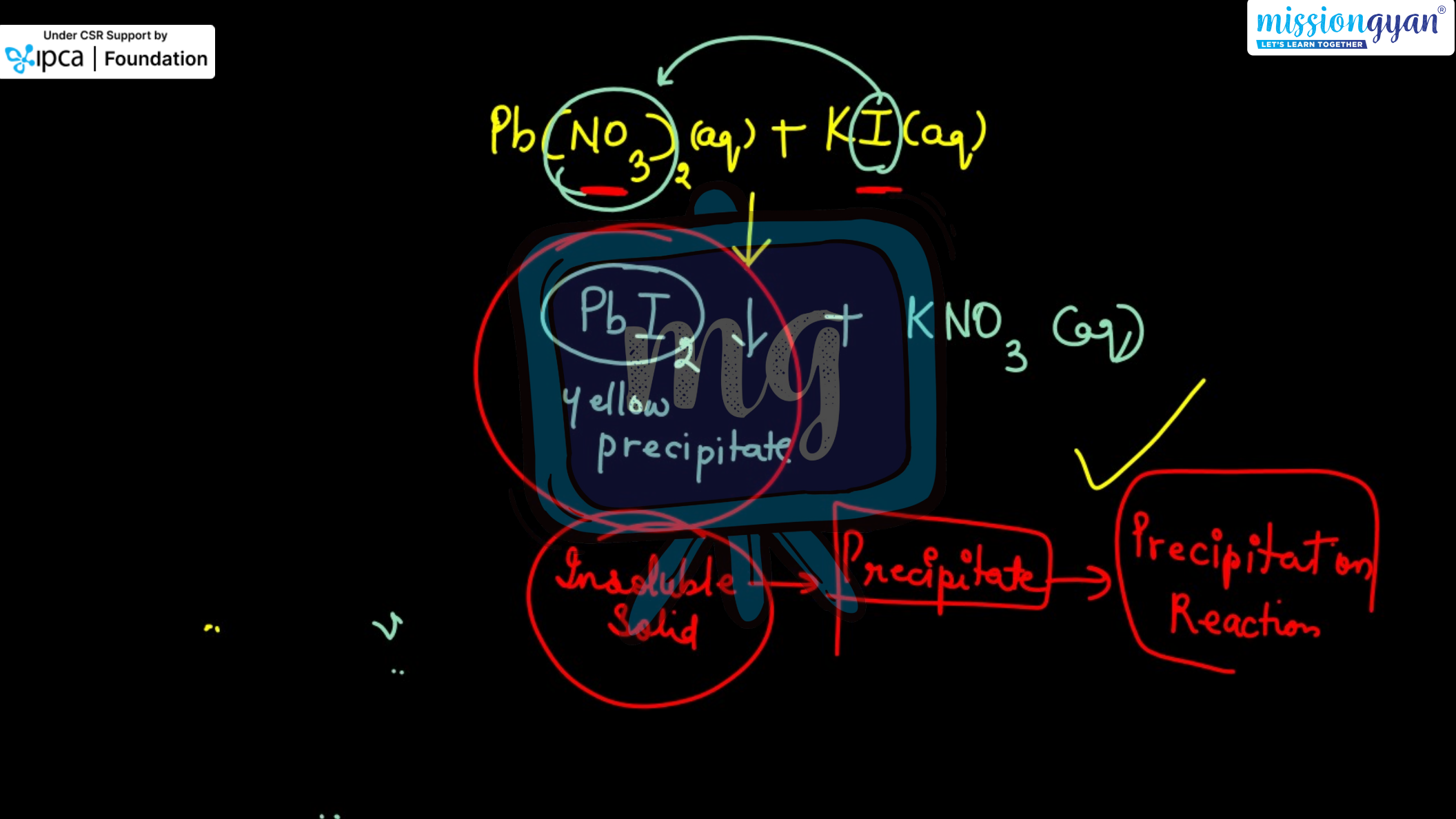
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"No precipitation reaction can occur without exchange of ions between the two reactants." Justify this statement giving a balanced chemical equation for the reaction.

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