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Class - 10

Chapter - 2

ACIDS, BASES AND SALTS

Part-5

pH Scale and Its Importance



Disha Didi (DD)

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① Acid $\xrightarrow{H_2O}$ $H^+(aq)$ ions → acidity.

Base $\xrightarrow{H_2O}$ $OH^-(aq)$ ions → Basicity.

B → R

R → B

$C_6H_{12}O_6$ / C_2H_5OH

② Acid & Base

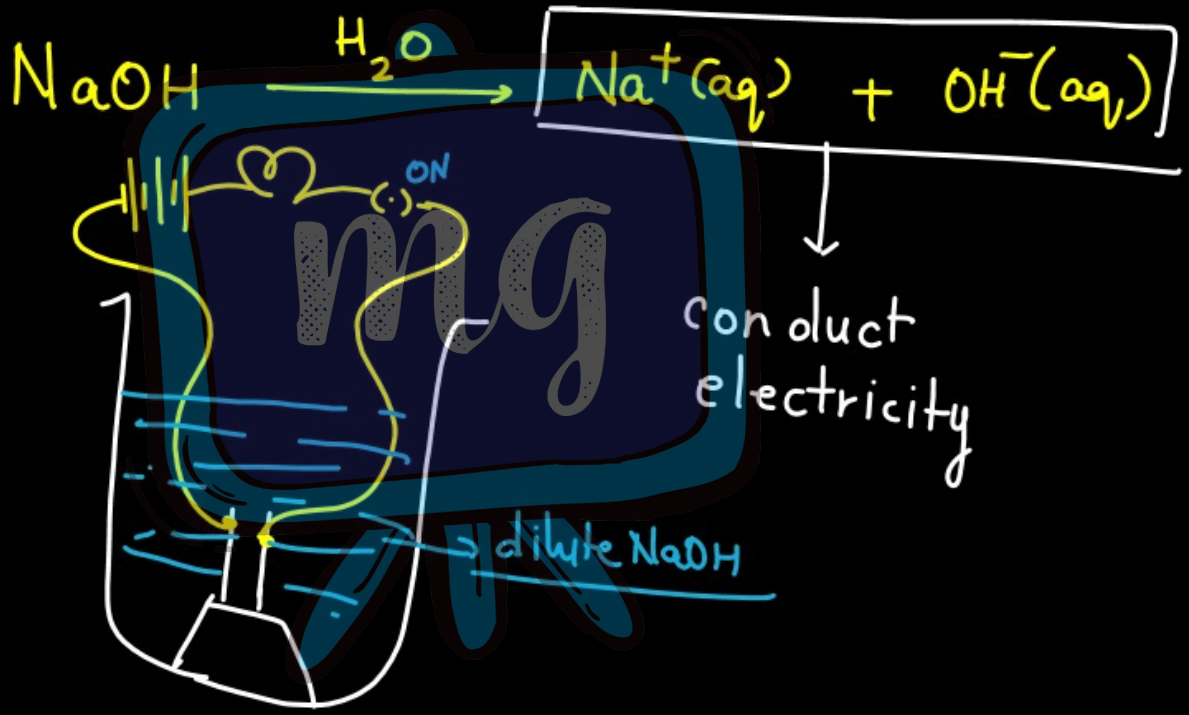
Conduct electricity

$H_2SO_4 \xrightarrow{H_2O} aq\ H^+ ions + SO_4^{-2}$

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Base

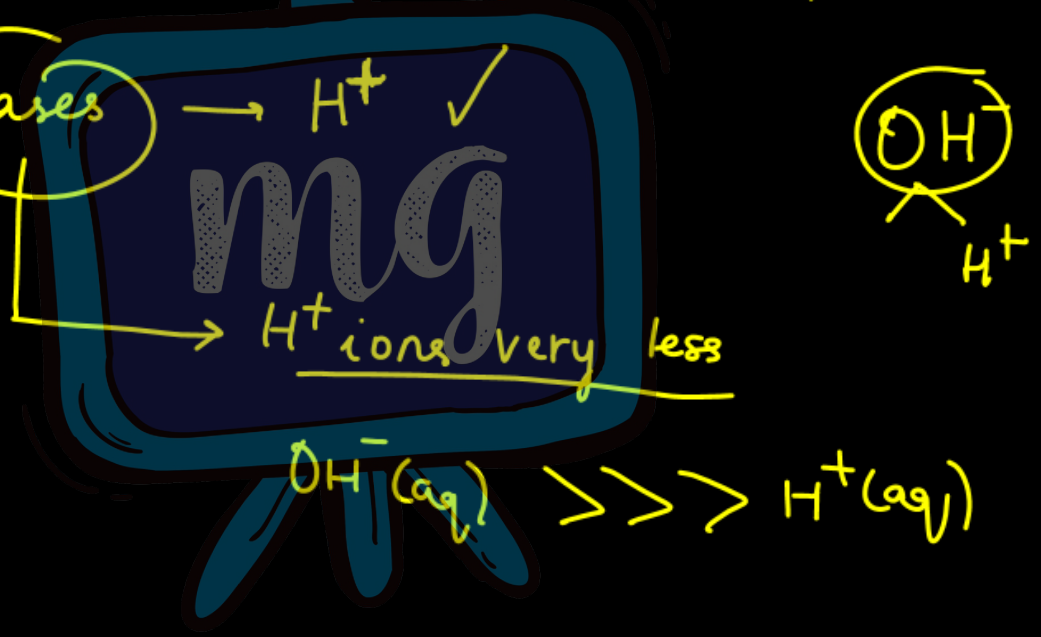


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Q. Do bases also have H^+ ions ?

Ans. Bases → H^+ ✓



H^+ ions very less

$OH^-_{(aq)} >>> H^+_{(aq)}$

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acids
↓
all conduct electricity ✓

Types of Acid

Strong Acid

- HCl
- H_2SO_4
- HNO_3

Weak Acid

- CH_3COOH
- H_2CO_3

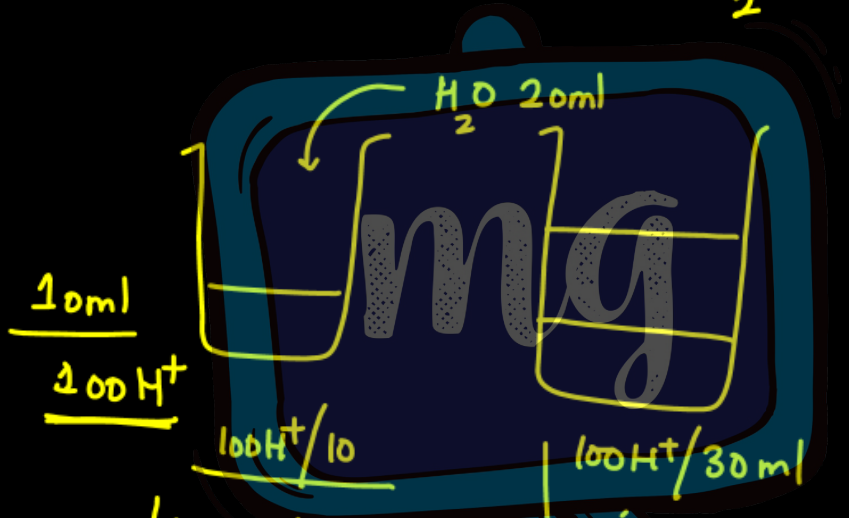
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Dilution

Acid ⟶ add H_2O

OH^-



10 → 100

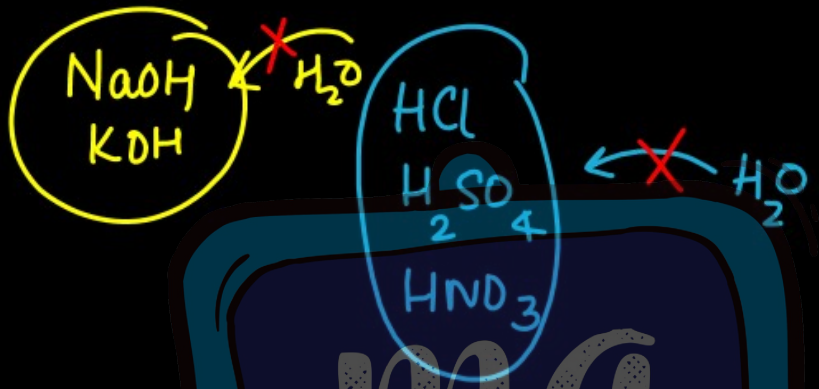
1 → $\frac{100}{10}$ = 10 ions

30 → 100

1 → $\frac{100}{30}$ = 3.33 ions ≃ 3 ions

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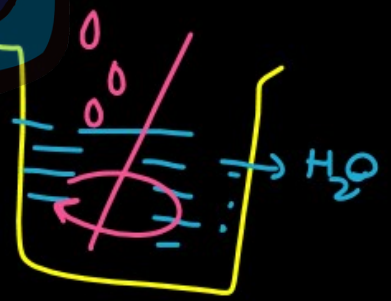
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Dilute : ① Add acid to water

→ drop by drop

→ constant Stirring

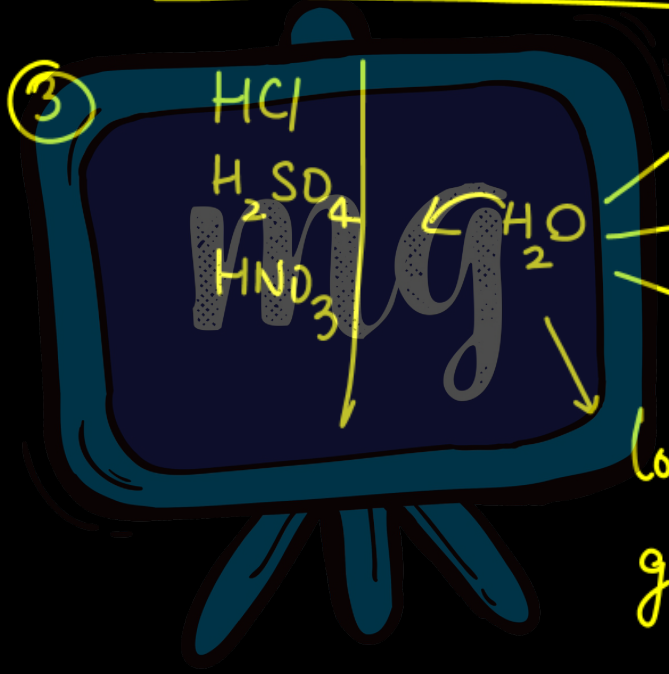


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② Acid + H_2O → Highly Exothermic Reaction

③



- lot of Δ is generated
- Splash
- burns

locally heat generation
glass beaker breaks

∴

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Dilution of Acid :

- The process of dissolving an acid in water is called dilution.
- It is a highly exothermic process.
- Care must be taken while mixing concentrated nitric acid or sulphuric acid with water.

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- The acid must always be added slowly to water with constant stirring.
- If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns.



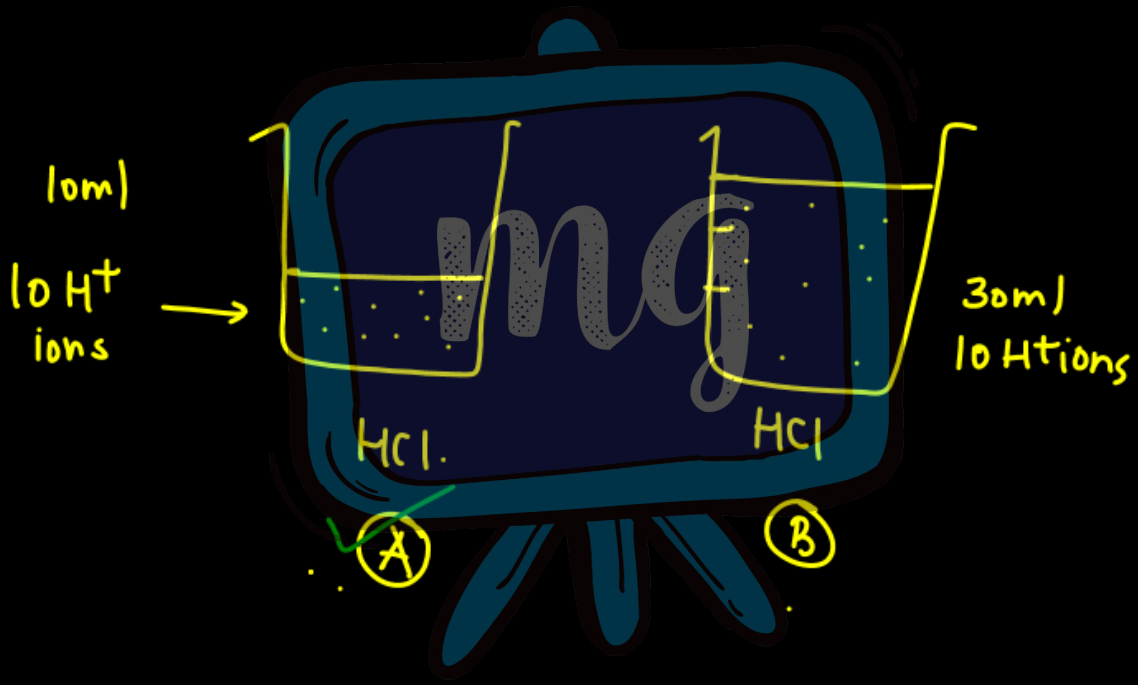
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- The glass container may also break due to excessive local heating.
- Mixing an acid with water results in decrease in the concentration of ions (H_3O^+) per unit volume.

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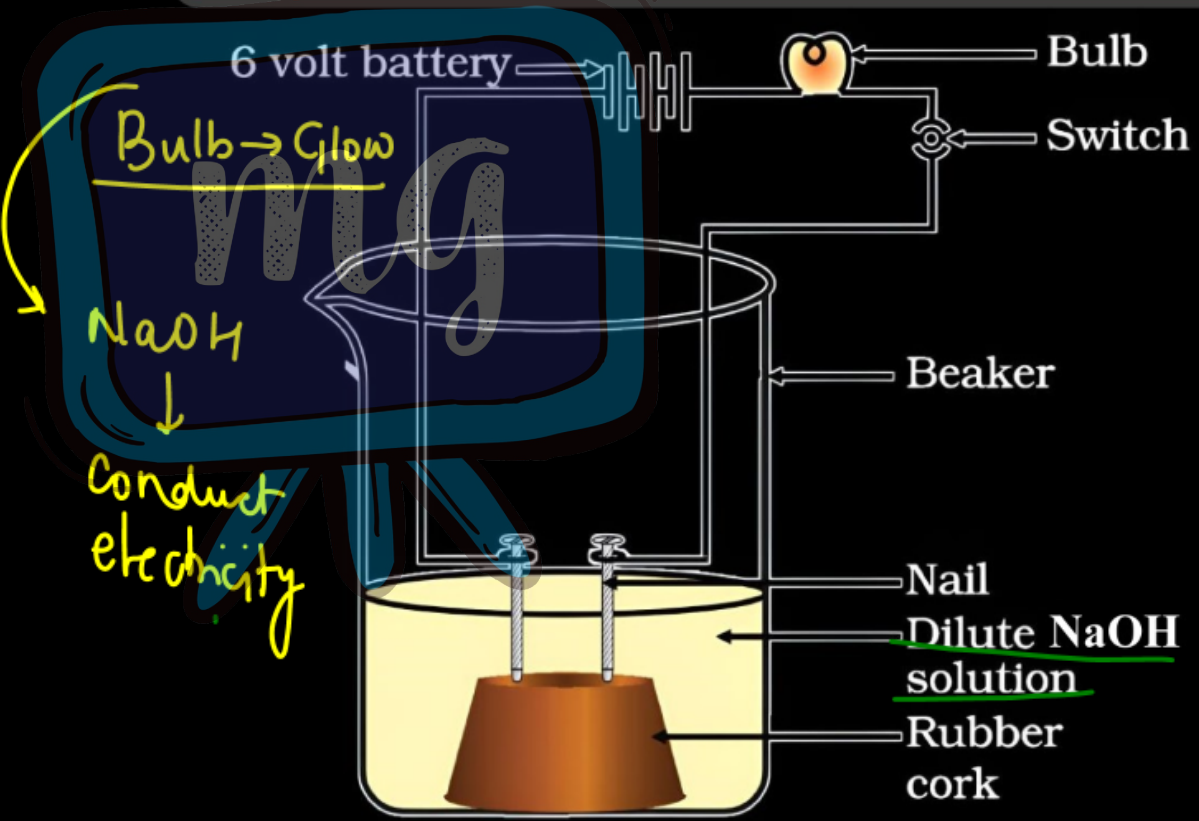
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Base Solution in Water Conduct Electricity



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Observation :

The bulb will start glowing in the case of Base.

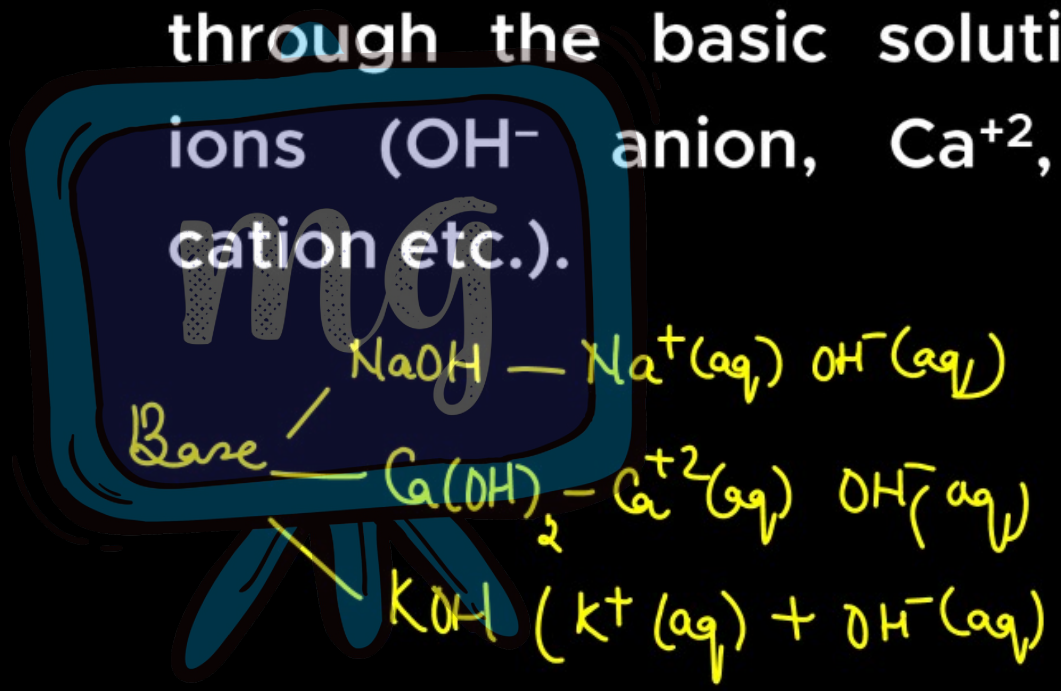
Conclusion :

Glowing of the bulb indicates that there is a flow of electric current through the solution.

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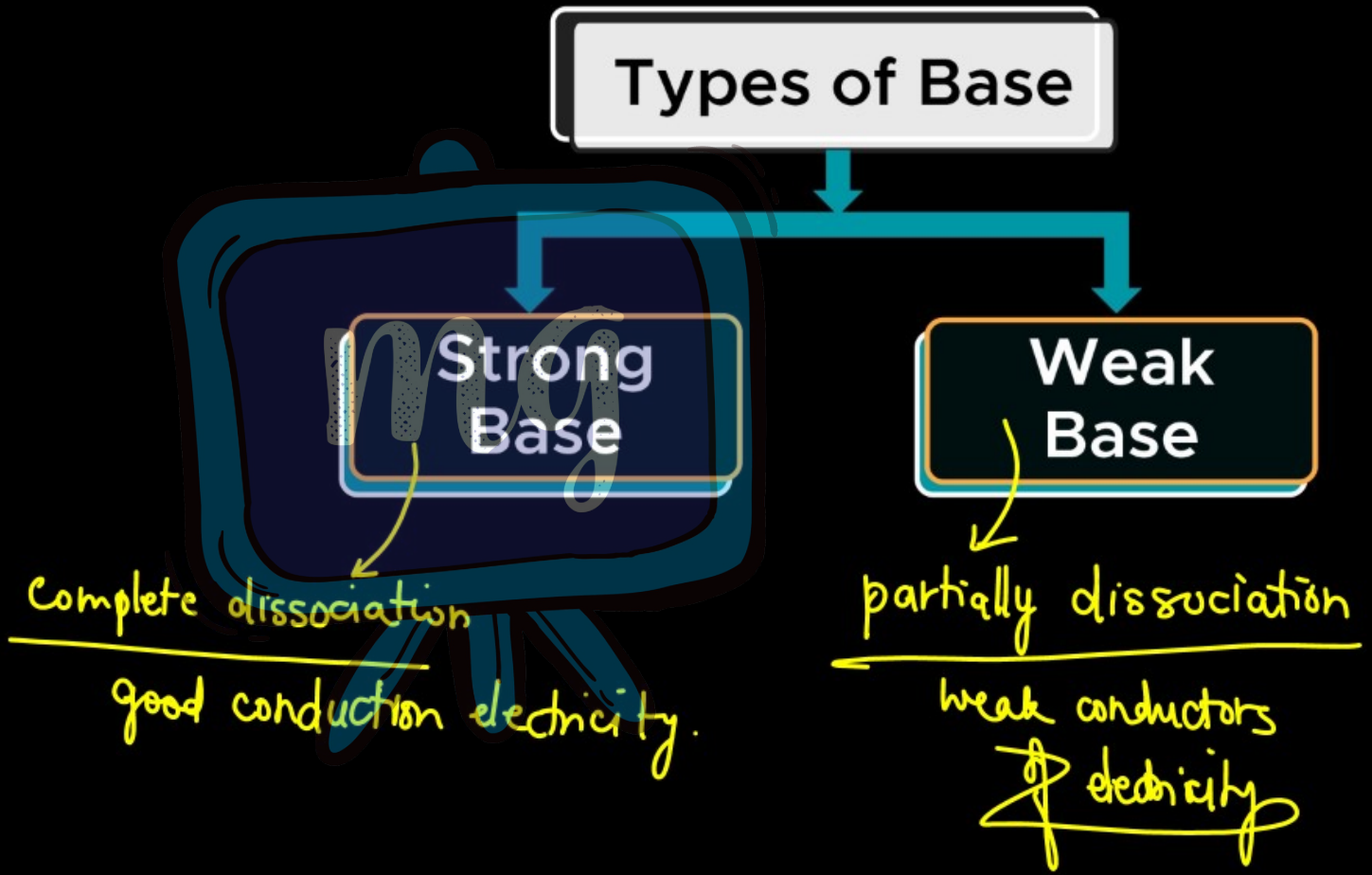
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The electric current is carried through the basic solution by ions (OH^- anion, Ca^{+2}, Mg^{+2} cation etc.).



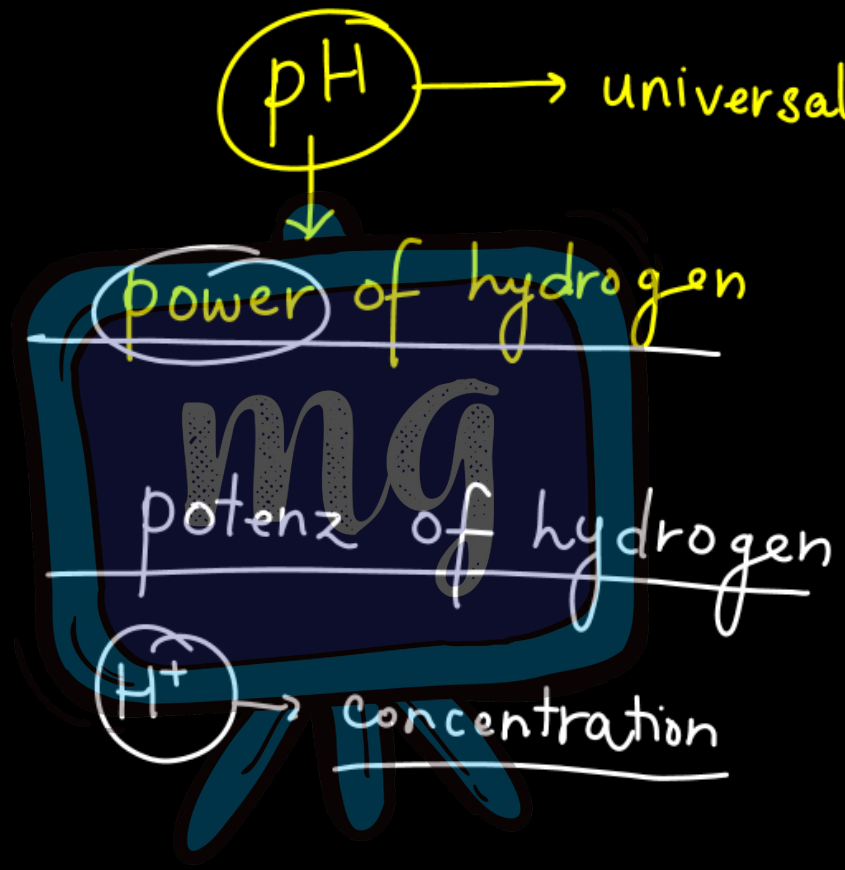
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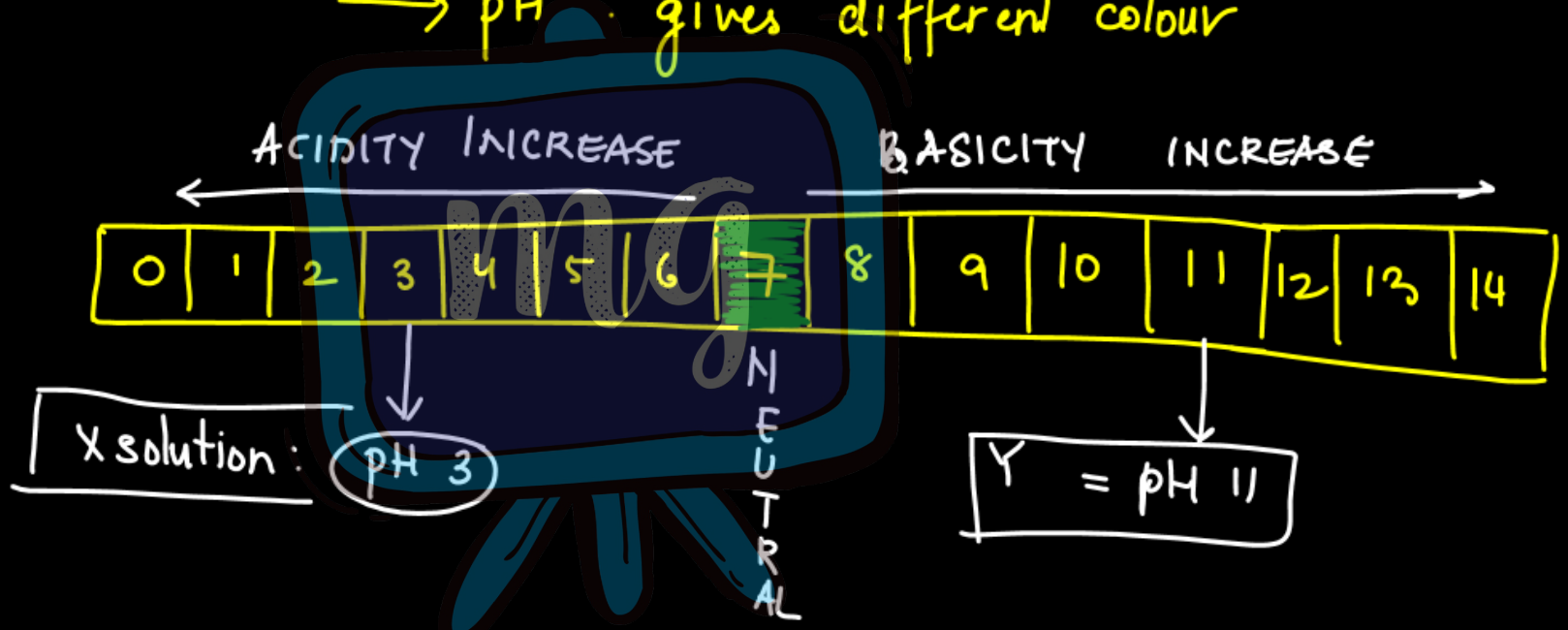


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→ mixture of several indicators

→ pH : gives different colour

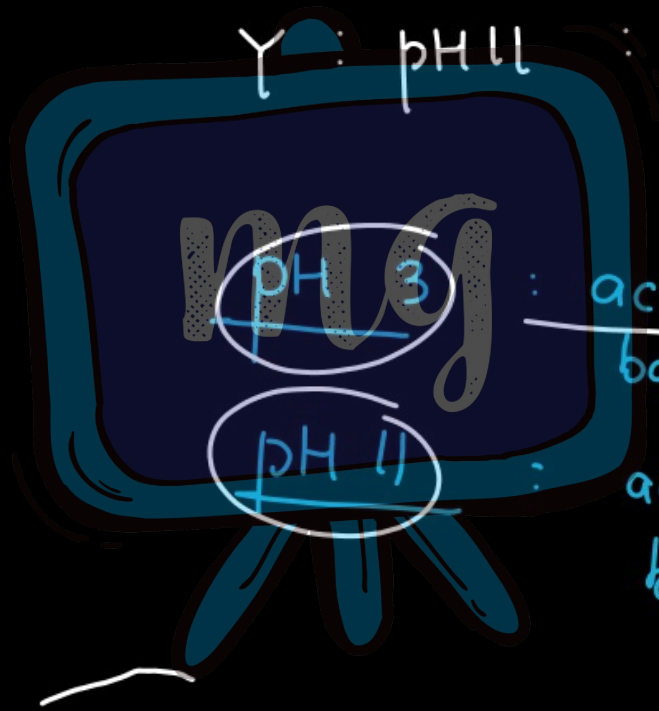


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X : pH 3 : ACIDIC

Y : pH 11 : BASIC



pH 3 : acidity ↑ — more H^+ ions
basicity ↓

pH 11 : acidity ↓ — less H^+ ions
basicity ↑

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