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Class - 10

Chapter - 3

Metals And Non-Metals

Part-8

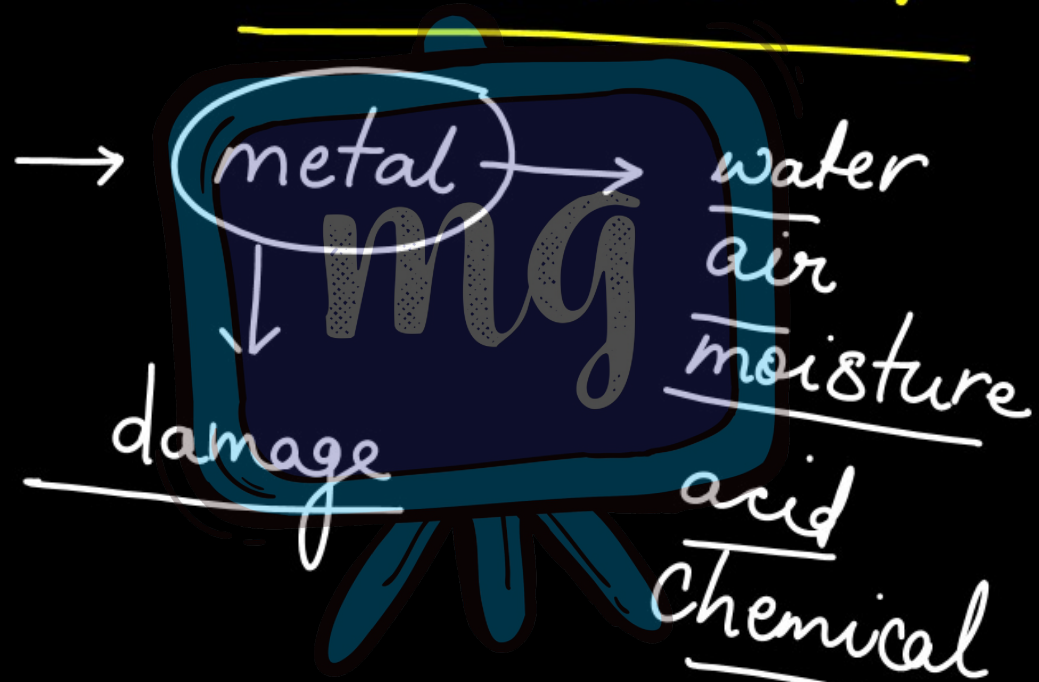
Metallurgy and Corrosion

Disha Didi (DD)

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CORROSION



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Rusting :

1) $Fe \rightarrow Fe_2O_3 \cdot xH_2O$

Blackening :

2) $Ag + H_2S \rightarrow Ag_2S + H_2$

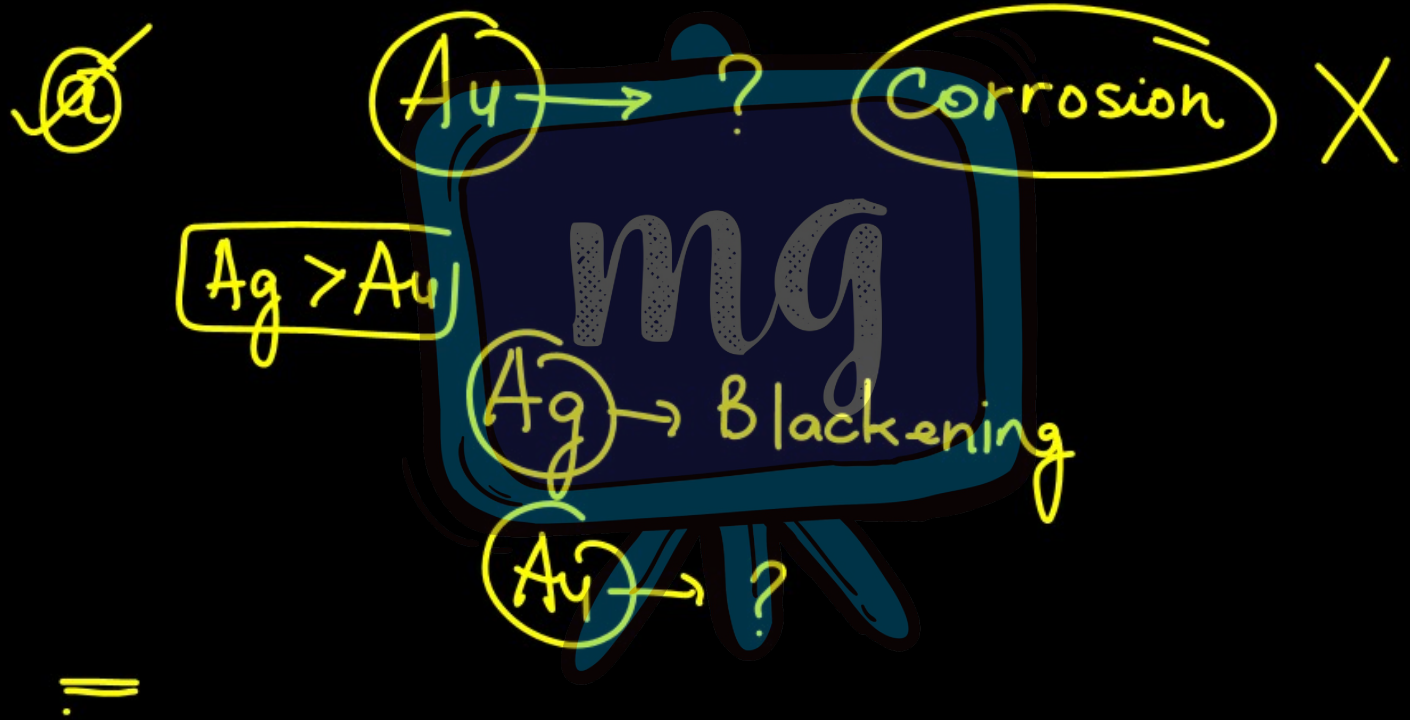
Orange Brownish

Black.

3) $CuCO_3 : Cu(OH)_2$ 1:1 → Green

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CORROSION

When a metal is attacked by substances around it such as moisture, acids, etc., it is said to corrode and this process is called corrosion.

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- The black coating on silver – Ag_2S. (Silver Sulphide)
- The green coating on copper – $CuCO_3 + Cu(OH)_2$.
- Rusting of iron – Fe_2O_3.

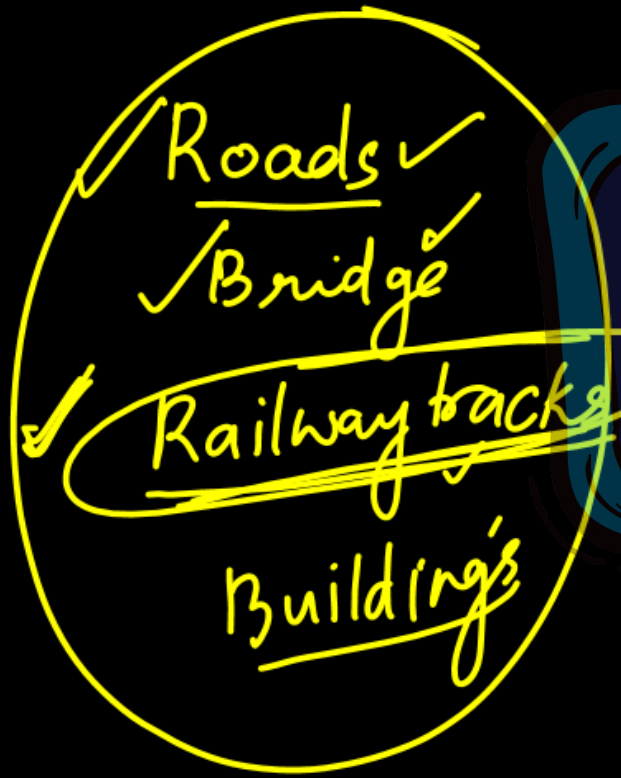




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- Corrosion causes damage to car bodies, bridges, iron railings, ships and to all objects made of metals, specially those of iron. Corrosion of iron is a serious problem.





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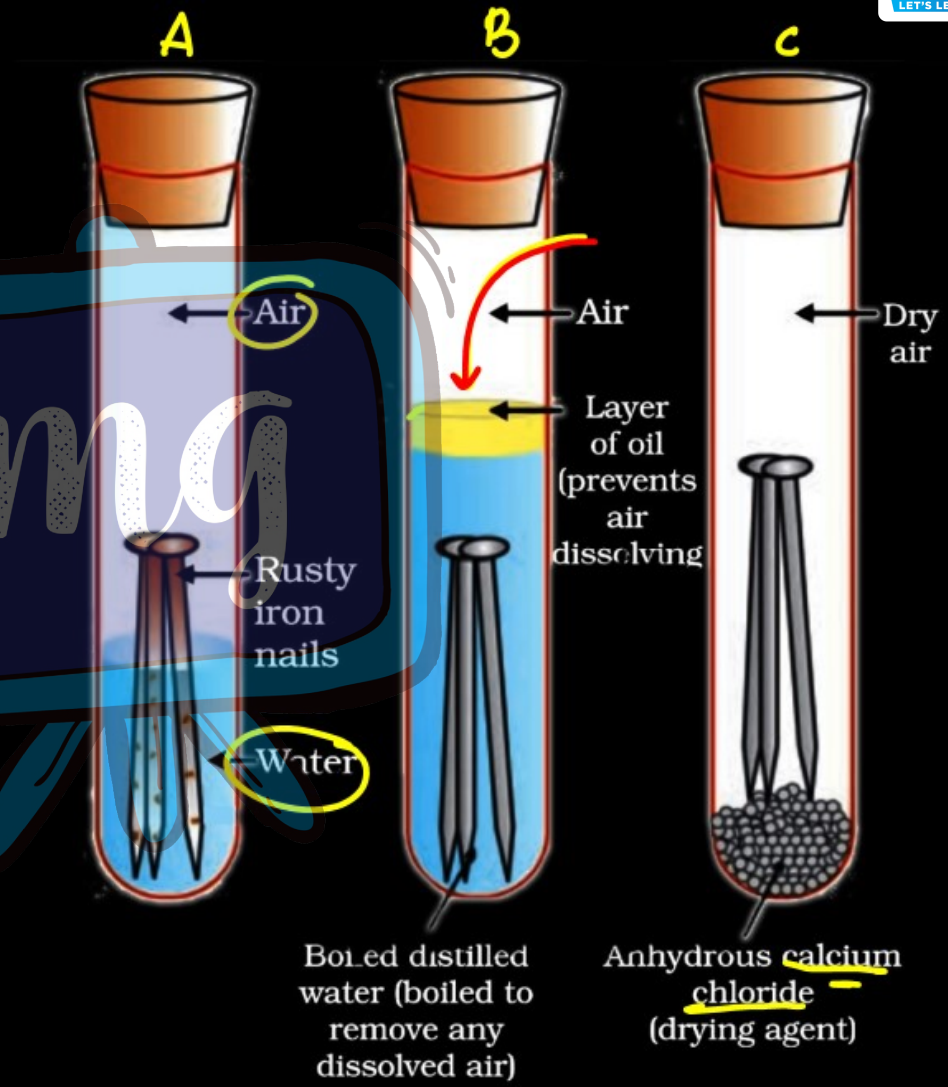
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Calcium Chloride

$CaCl_2$

Q. Why boiled water ?



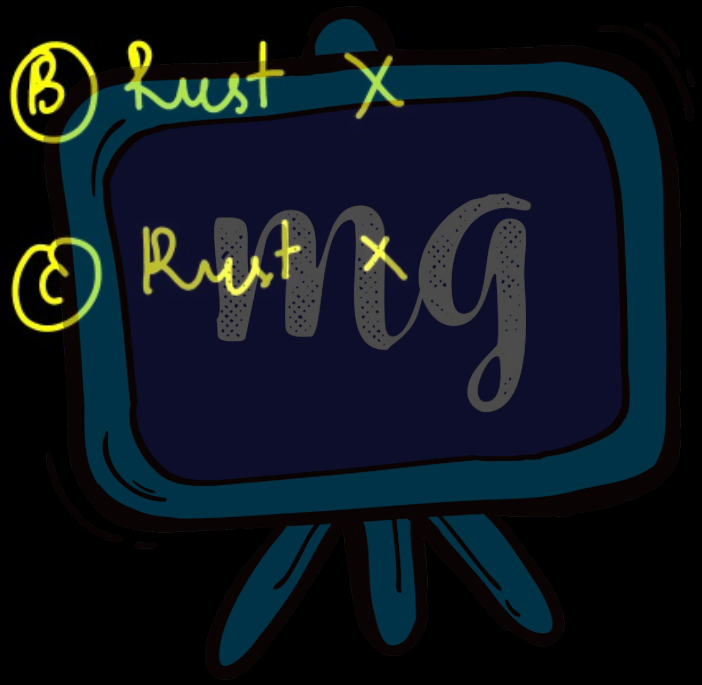
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(A) Rust ✓ ⟶ water + air

(B) Rust ✗

(C) Rust ✗



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Observation :

- Iron nails rust in test tube A, but they do not rust in test tubes B and C.

Conclusion :

- The nails are exposed to both air and water get rust.

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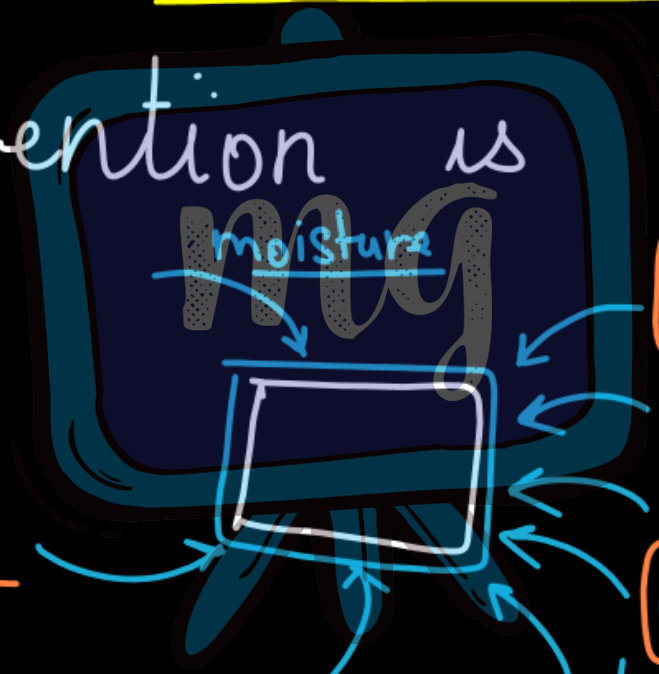
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Solution

Prevention is cure.

RANA

POGG



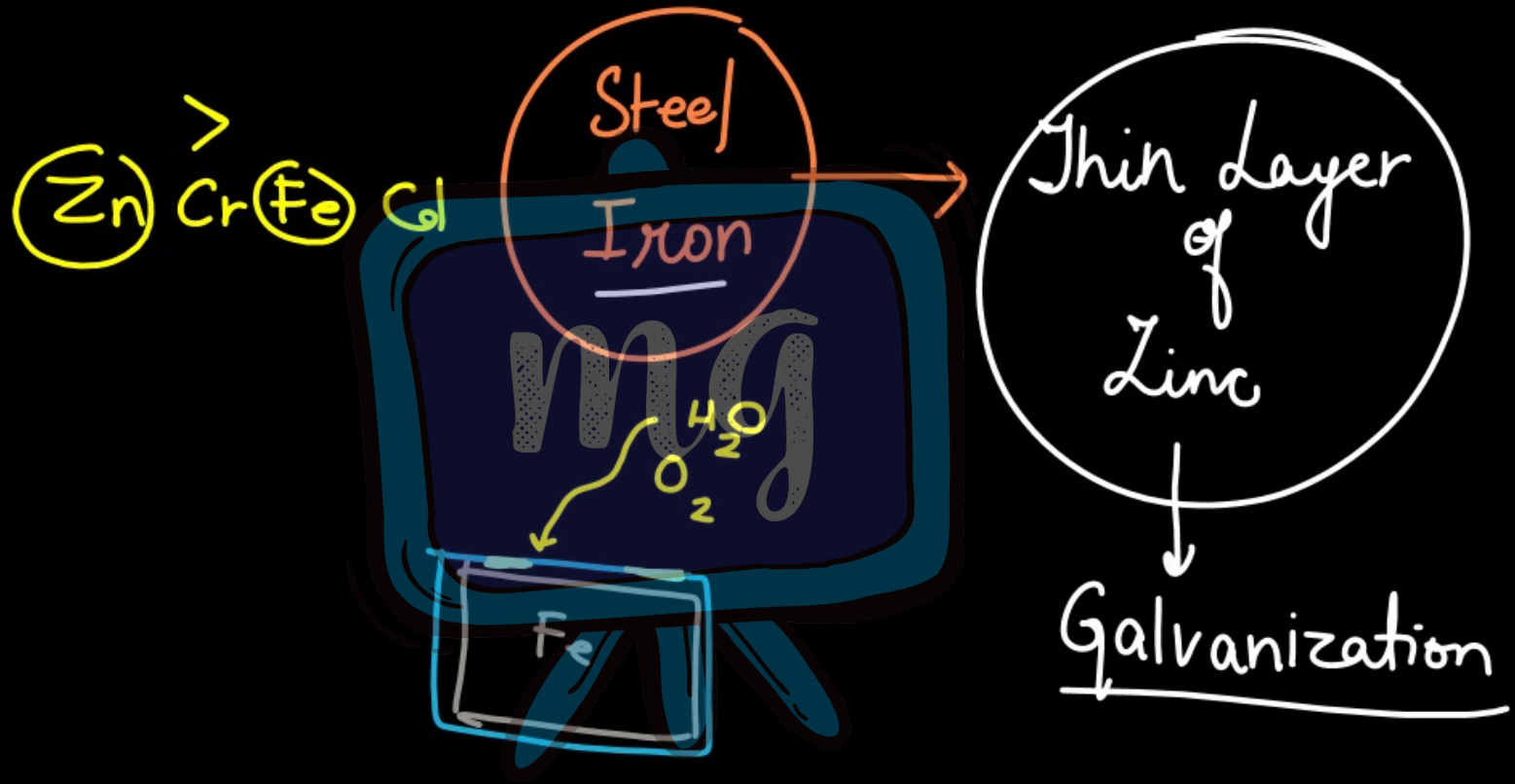
- Painting
- Oiling
- Greasing
- Galvanization

POGG

- alloy
- anodising
- chrome plating

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Prevention of Corrosion :

- The rusting of iron can be prevented by painting, oiling, greasing, galvanising, chrome plating, anodising or making alloys.

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Galvanising :

- Galvanisation is a method of protecting steel and iron from rusting by coating them with a thin layer of zinc.



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Alloying :

- An alloy is a homogeneous mixture of two or more metals, or a metal and a nonmetal.
- It is prepared by first melting the primary metal, and then, dissolving the other elements in it in definite proportions.
- It is then cooled to room temperature.

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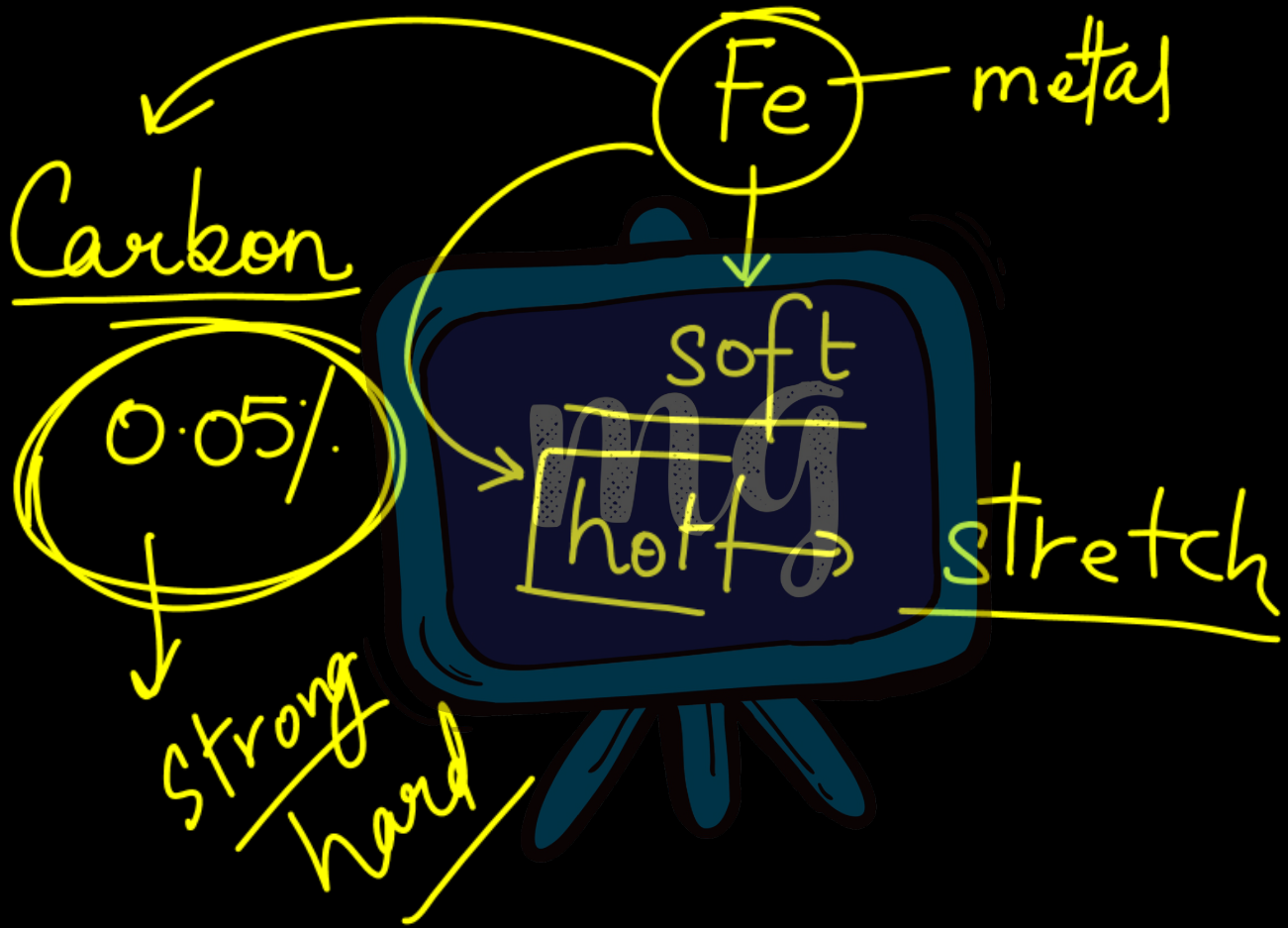
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ALLOY

- homogenous mixture
- 2 or more than metals
- metal + non-metal

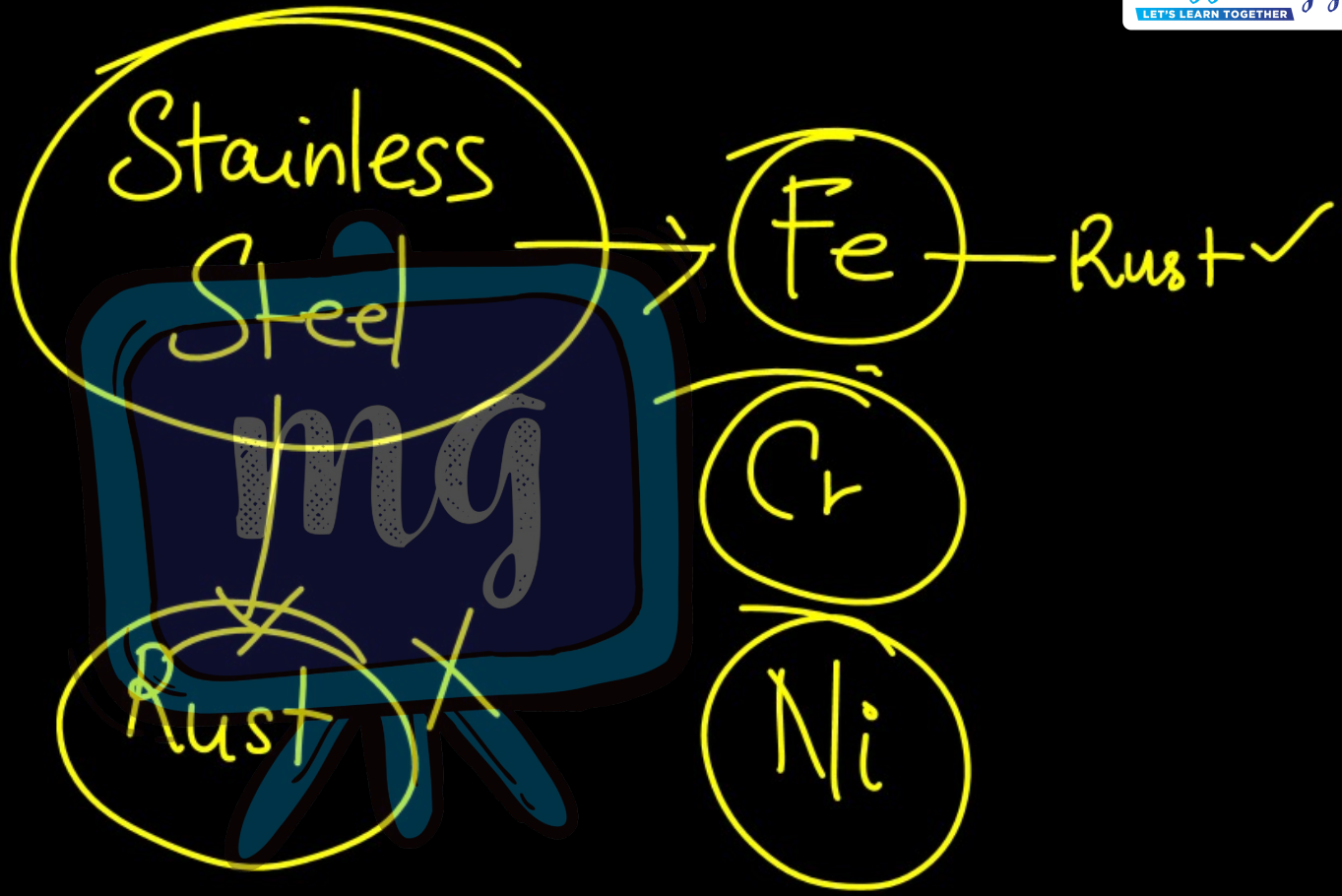
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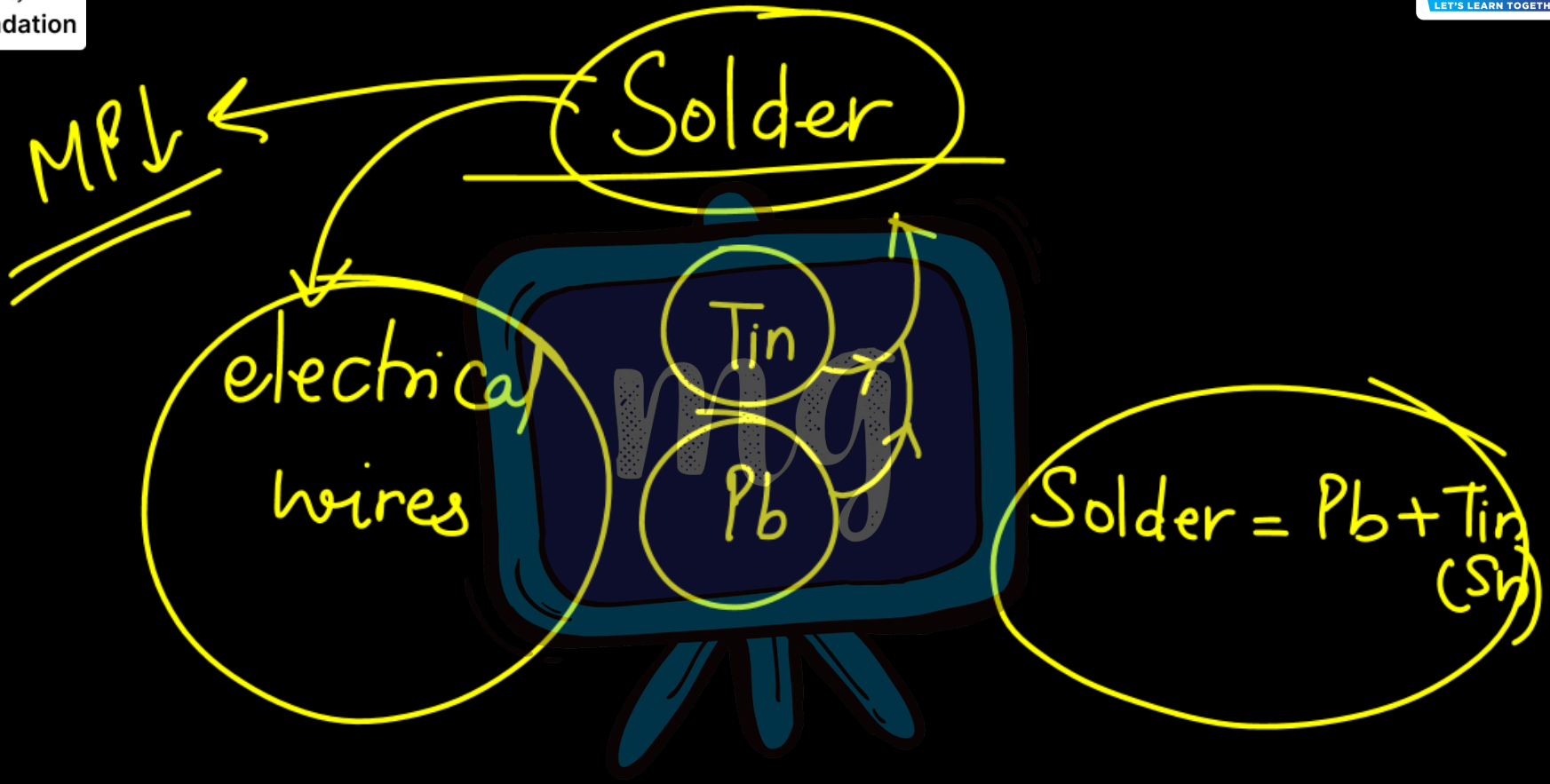


Properties of an Alloy :

- Alloys are stronger than the metal from which they are obtained.
- It is harder than the constituent metals.
- More resistance to corrosion.
- The melting point of alloys is lower than the constituent metals.

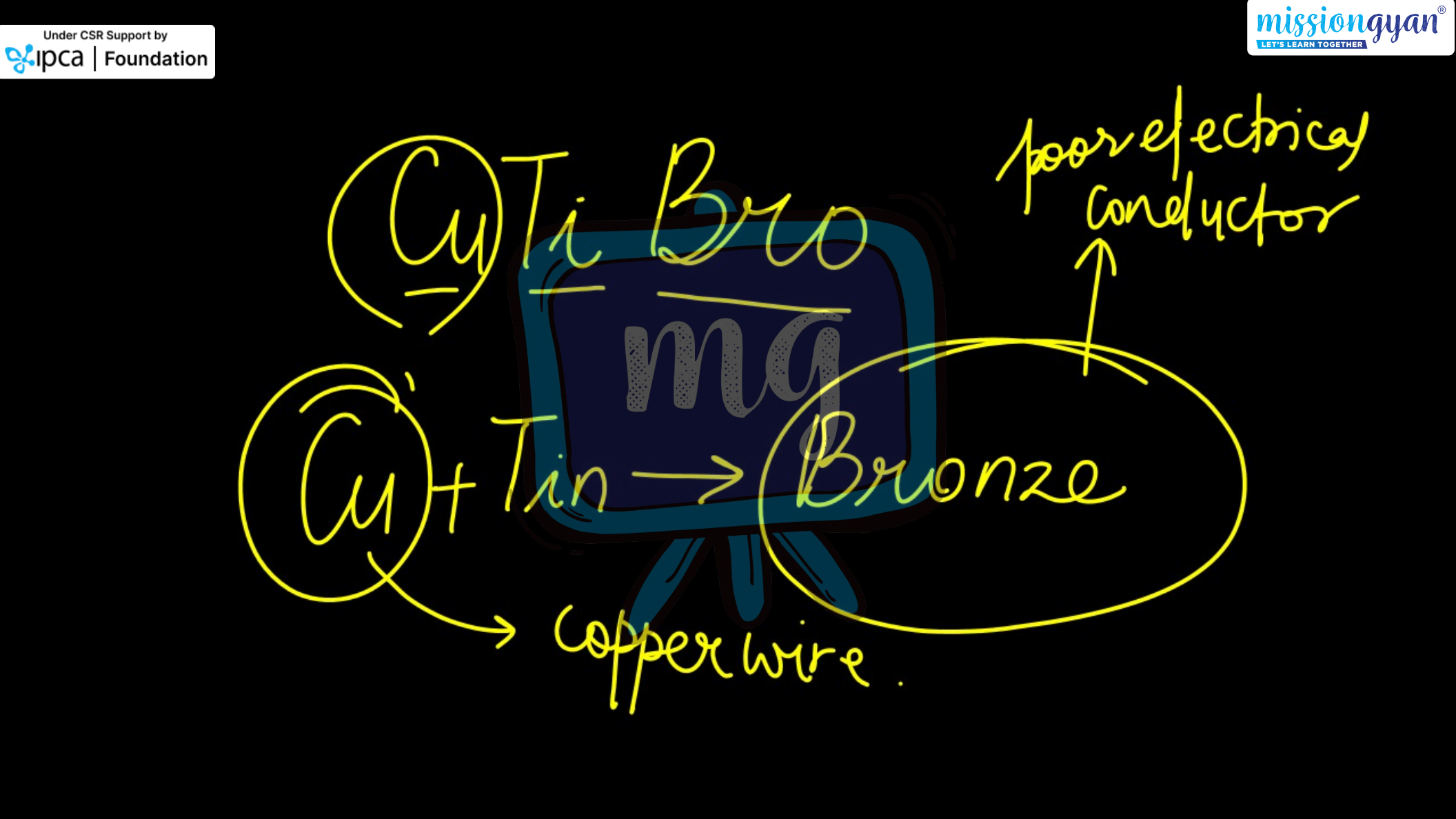
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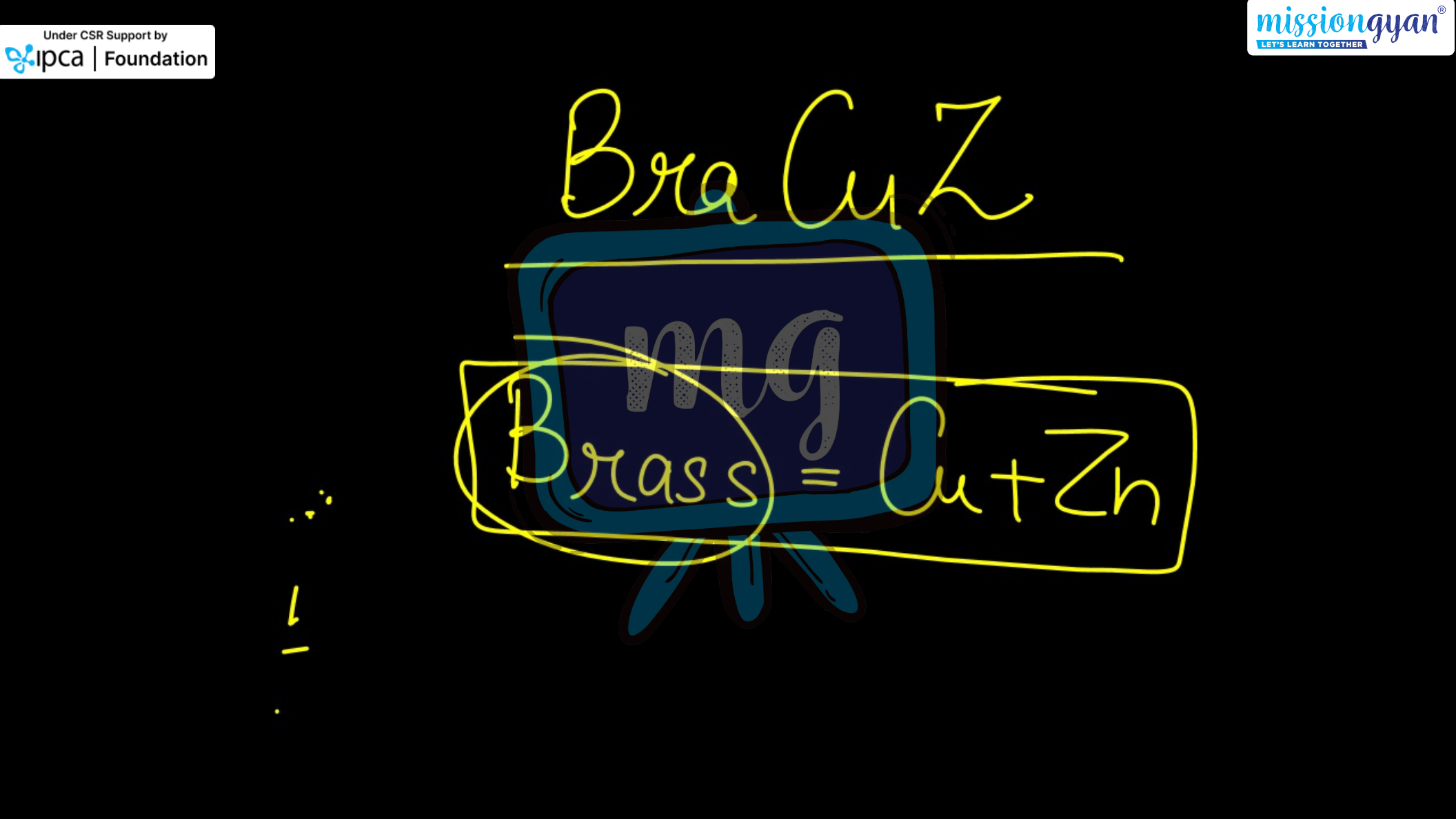
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Example :

Brass [66% Cu + 34% Zn]

Bronze [88% Cu + 12% Sn]

Poor conductor

Solder

[40% Pb + 60% Sn]

Low M.P. used for welding electricl wires.

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German Silver

[60% Cu + 20% Zn + 20% Ni]

Stainless Steel

[74% Fe + 18% Cr + 8% Ni]

- Hard and prevent rusting.

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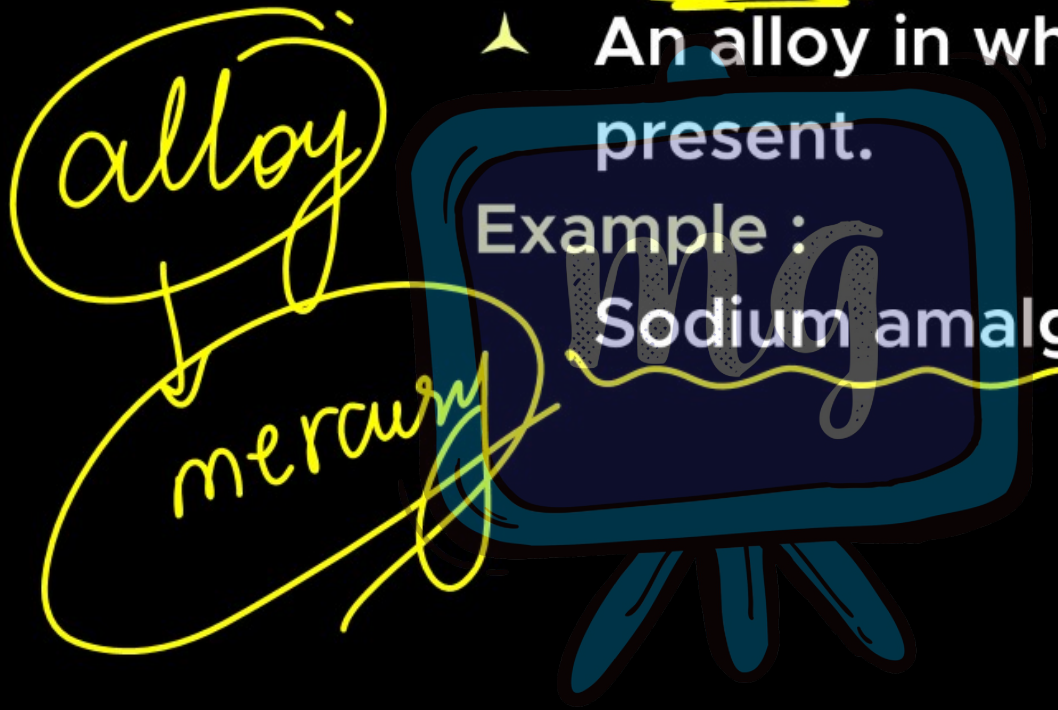
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Amalgam :

- An alloy in which mercury is present.

Example :

Sodium amalgam [Na(Hg)].



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Pure gold, known as 24 carat gold, is very soft. It is, therefore, not suitable for making jewellery. It is alloyed with either silver or copper to make it hard. Generally, in India, 22 carat gold is used for making ornaments. It means that 22 parts of pure gold is alloyed with 2 parts of either copper or silver.